U.S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

# GAGE BLANKS

(Second Edition)

## COMMERCIAL STANDARD CS8-33

[Issued December 22, 1933, Supersedes CS8-30]

Effective date for new production January 1, 1934, and clearance of existing stocks January 1, 1935




## A RECORDED STANDARD OF THE INDUSTRY

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## PROMULGATION STATEMENT

At the request of the American Gage Design Committee, a pamphlet entitled "Plain and Thread Plug and Ring Gage Blanks, Recommended Commercial Standard" was circulated on March 4, 1930, to producers and users for written acceptance. After acceptance in writing by the industry it was published as Commercial Standard CS8-30, Plain and Thread Plug and Ring Gage Blanks.

Acting on the recommendation of the American Gage Design Committee and following approval by the Standing Committee, the revised standard was circulated in June 1933 to the industry for written acceptance. The industry has since accepted and approved for promulgation by the Department of Commerce through the Bureau of Standards the revised standard as shown herein.

This recommendation was effective for new production on January 1, 1934, and for clearance of existing stocks on January 1, 1935.

Promulgation recommended.

I. J. Fairchild,
*Chief, Division of Trade Standards.*

Promulgated.

Lyman J. Briggs,
*Director, Bureau of Standards.*

Promulgation approved.

Daniel C. Roper,
*Secretary of Commerce.*

# GAGE BLANKS

(Second Edition)

# COMMERCIAL STANDARD CS8-33

## SCOPE

This standard covers standard designs for: Plain and thread plug gage blanks to 12.010 inches maximum gaging diameter; plain and thread ring gage blanks to 12.260 inches maximum gaging diameter; adjustable snap gages to 12 inches; adjustable length gages to any desired length; and twin ring gages or combination ring and snap gages for work up to 1.135 inches diameter.

## TERMINOLOGY

The following glossary is intended to clarify the meaning of certain technical terms employed in this report. The definitions are not intended to be general; rather they are specific as to their application to the American Gage Design Standards.

*American Gage Design Standard.*—The caption "American Gage Design Standard" has been adopted to designate gages made to the design specifications promulgated by the American Gage Design Committee.

The term *anvil* is employed to designate the gaging member of a snap gage when constructed as a fixed nonadjustable block, or as the integral jaw of the gage.

The *drift hole* or *drift slot* is a small hole or slot provided in the side of a taper lock gage handle near the "go" end through which a pin or drift may be inserted for the purpose of ejecting the gaging member from the handle.

The *flange* is that external portion of a large ring gage which is reduced in section for the purpose of lightening the gage.

The *frame* of a snap gage is the body portion of the gage as distinct from the gaging pins, gaging buttons, anvils, and adjusting or locking mechanism.

A *gaging button* is an adjustable gaging member of a snap gage consisting of a shank and a flanged portion, the latter constituting the gaging section.

The *gaging member* is that integral unit of a gage which is accurately finished to size and is employed for size control of the work. In taper lock plug gages, the gaging member consists of a shank and a gaging section.

A *gaging pin* is a straight, unflanged adjustable gaging member of an adjustable snap gage.

The *gaging section* is that portion of the gage which comes into physical contact with the work. In the plug range above 1.510 to and including 12.010 inches, the gaging section is identical with the gaging member.

The *handle* is that portion of a gage which is employed as supporting means for the gaging member or members. In the American Gage Design Standards, three types of handles are employed, namely, the taper lock design handle, the reversible design handle, and the ball handle.

The *hub* is the mid-section of a flanged ring gage. It determines the length of the gaging section.

*Length gage heads* are the end portions of a length gage carrying and including the gaging members.

A *length gage spacing bar* is the central portion of a length gage which carries at its extremities the two length gage heads.

*Lightening holes* are unfinished drilled holes provided in the heavier sizes of gaging members for the sole purpose of reducing the weight of the gage.

A *marking disk* is a plate which can be attached to a gage frame to provide, when suitably marked, a means of identification for the gage.

An *annular plug gage* is a shell type plug gage in which the gaging member is in the form of a ring, the external surface of which is the gaging section, the central portion of the web being machined away for the purpose of reducing weight, ball handles being provided for convenience in handling. This construction is employed for plain and thread plug gages in the ranges above 8.010 inches.

A *plain cylindrical plug gage* is a complete unthreaded internal gage of single- or double-ended type for the size control of holes. It consists of handle and gaging member or members, with suitable locking means.

A *progressive cylindrical plug gage* is a complete unthreaded internal gage consisting of handle and gaging member in which the "go" and "not go" gaging sections are combined in a single unit secured to one end of the handle.

A *reversible plug gage* is a plug gage in which three wedge-shaped *locking prongs* on the handle are forced into corresponding *locking grooves* in the gaging member by means of a single through screw, thus providing a self-centering support with a positive lock. This design is standard for all plug gages in the ranges above 1.510 to and including 8.010 inches, with the exception of pipe thread plug gages, for which it is standard in the ranges above 2-inch nominal pipe size, to and including 6-inch nominal pipe size.

A *thread plug gage* is a complete internal thread gage of either single- or double-ended type, comprising handle and threaded gaging member or members, with suitable locking means.

A *plain ring gage* is an unthreaded external gage of circular form employed for the size control of external diameters. In the smaller sizes it consists of a gage body into which is pressed a *bushing*, the latter being accurately finished to size for gaging purposes.

A *thread ring gage* is an external thread gage employed for the size control of threaded work, means of adjustment being provided integral with the gage body.

The *thread ring gage locking device* is a means of expanding and contracting the thread ring gage during the manufacturing or resizing processes. It also provides an effectual lock. It comprises an *adjusting screw*, a *locking screw*, and a *sleeve*. For detailed description and illustration see page 25.

The *shank* is that portion of the gaging member which is employed for fixing the gaging member in the handle or frame.

A *plain adjustable snap gage* is a complete external caliper gage employed for the size control of plain external dimensions, comprising an open frame, in both jaws of which gaging members are provided, one or more pairs of which can be set and locked to any predetermined size within the range of adjustment.

A *plain solid snap gage* is a complete external caliper gage employed for the size control of plain external dimensions, comprising an open frame and jaws, the latter carrying gaging members in the form of fixed, parallel, nonadjustable anvils.

A *snap gage adjusting screw* is a threaded member employed for adjusting to any predetermined setting the gaging pins or gaging buttons of an adjustable snap or length gage.

The *snap gage locking device* is that portion of an adjustable snap or length gage which is employed for locking the adjustable gaging members in fixed position. It comprises a *locking screw*, a *locking bushing*, and a *locking nut*. For detailed description see figure 7, page 37.

*Adjusting slots* are radial slots provided in thread ring gages in order to facilitate expansion and contraction of gage size by means of the adjusting device. An adjusting slot always terminates in an *adjusting slot terminal hole.*

The *locking slot* is that slot which passes entirely through the wall of a thread ring gage. In conjunction with the thread ring gage locking device, it permits expansion and contraction of gage size.

The term "*taper lock*" designates that construction in which the gaging member has a taper shank, which is forced into a taper hole in the handle. This design is standard for all plug gages in the range above 0.059 inch to and including 1.510 inches, and for pipe-thread plug gages up to and including 2-inch nominal pipe size.

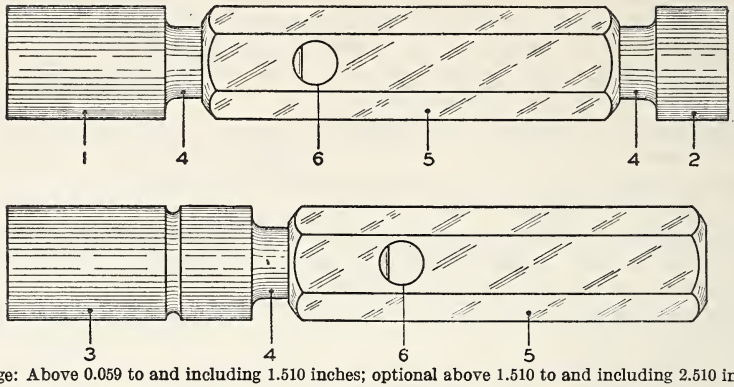
## DETAILS OF CONSTRUCTION, AMERICAN GAGE DESIGN STANDARDS

### PLAIN CYLINDRICAL PLUG GAGE BLANKS

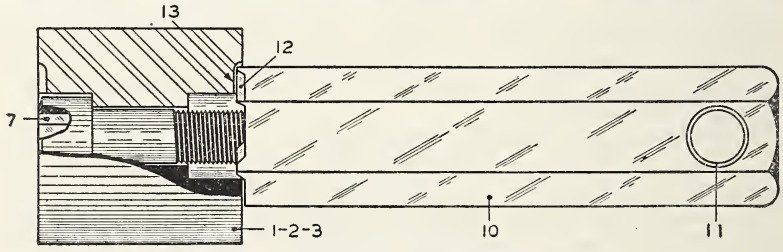
Three separate designs have been adopted for plain cylindrical plug gages—the *taper lock* design for the range from 0.059 to and including 1.510 inches, the *reversible* design with reversible gaging members for the range from above 1.510 to and including 8.010 inches, and the annular design for the range from above 8.010 to and including 12.010 inches. For sizes above 0.240 inch to and including 2.510 inches, both straight and progressive gaging members are provided.

#### (a) TAPER LOCK DESIGN, ABOVE 0.059 TO AND INCLUDING 1.510 INCHES

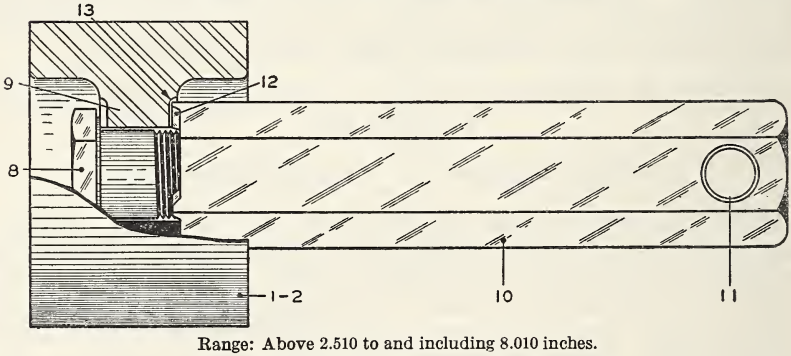
It was felt that the taper lock design was particularly well suited for the smaller sizes of plain plug gages. This type of gage is simple and is economical of production and maintenance. The gaging member has a taper shank which is forced into a taper hole in the handle. When properly assembled, the taper lock gage possesses the rigidity of a solid gage and is entirely free of shake or "wink." Drift slots or drift holes are provided near one end of the handle, permitting gaging members to be removed when replacement is necessary. In the case of double-end gages, one end is removed by running a rod through the hollow handle. In the smaller size ranges above 0.059 inch to and including 0.240 inch, a groove is provided near one end of the handle



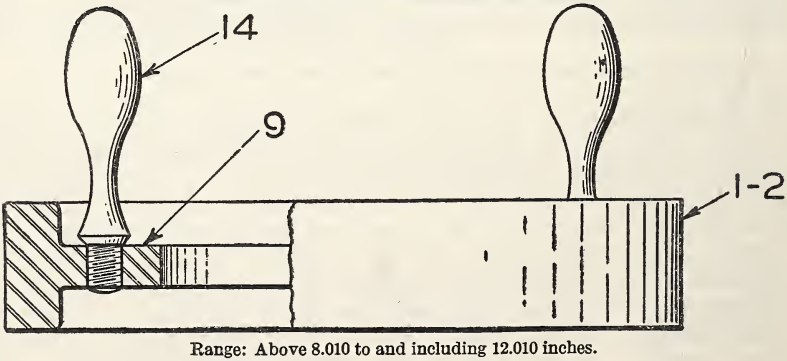

Range: Above 0.059 to and including 1.510 inches; optional above 1.510 to and including 2.510 inches.




Range: Above 1.510 to and including 2.510 inches.




Range: Above 2.510 to and including 8.010 inches.




Range: Above 8.010 to and including 12.010 inches.

FIGURE 1.—*American Gage Design Standard plain cylindrical plug gages.*

DETAILS OF CONSTRUCTIGN, FIGURE 1

1. "Go" gaging member
2. "Not go" gaging member
3. Progressive gaging member
4. Shank
5. Taper lock handle
6. Drift hole (or slot)
7. Socket head screw
8. Hexagon head screw
9. Web
10. Handle for reversible gage
11. Cross-pin hole
12. Locking prong
13. Locking groove
14. Ball handle

to designate the "not go" end, as the length of the "go" member in this range is often insufficient clearly to distinguish it from the "not go" member. The groove is omitted as unnecessary above 0.240 inch.

Complete dimensional tolerances have been established for the mating parts of gaging members and handles, insuring absolute interchangeability of gaging members and handles wherever manufactured. General details of construction will be apparent from figure 1, page 4. See also tables 1 to 4, pages 7 to 11.

#### (b) REVERSIBLE DESIGN, ABOVE 1.510 TO AND INCLUDING 8.010 INCHES

Considerations of rigidity of construction and long life have dictated the choice of the reversible design with reversible gaging members for the size range above 1.510 to and including 8.010 inches. With this construction there is no chance for shake or "wink" to interfere with the sensitive feel so necessary in gages of this type. Three wedge-shaped locking prongs on the handle are forced into corresponding grooves in the gaging member by a single through screw, thus providing a self-centering support with a positive lock, and resulting in a degree of rigidity equivalent to that of a solid gage. The useful life of the plug is furthermore materially increased, as when one end is worn the plug can be reversed, and is then, for most purposes, as good as new.

The construction is protected by carefully worked out dimensional limits, and interchangeability is insured between gaging members and handles wherever manufactured. Details of construction will be apparent from figure 1, page 4, and figure 2, page 9. See also tables 5 and 6, pages 12 and 13.

#### (c) ANNULAR DESIGN, ABOVE 8.010 TO AND INCLUDING 12.010 INCHES

Because of the fact that large plug gages are heavy and difficult to handle, it was necessary to adopt a design for the range above 8.010 inches which would have the lightest possible section consistent with strength and permanence. The annular design having a rim and web of properly proportioned section, the center being bored out for purposes of weight reduction, has, therefore, been adopted as standard. The web is provided with four tapped holes for convenience in bolting to face plate during manufacturing. Two of these are further employed for fixing ball handles to the gaging member.

Details of construction have been worked out and are completely dimensioned in table 7, page 14.

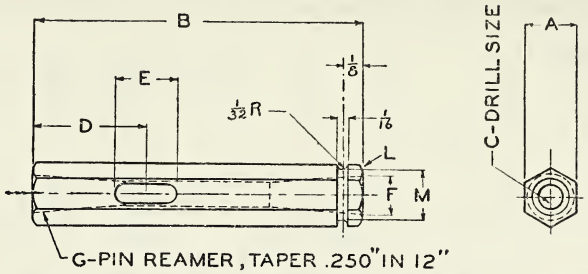
### HANDLES FOR PLAIN CYLINDRICAL AND THREAD PLUG GAGE BLANKS

Handles for both taper lock and reversible gages are of the hexagonal type, while commercial ball handles are employed for the annular plug gage and for certain of the larger ring thread gages.

Taper lock and reversible handles are completely dimensioned in tables 1 and 2, and figure 2. Ball handles, being a commercial merchantable product, are not specifically dimensioned, but minimum dimensions are set forth in figure 2, page 9.

Handles as designed for all gages offer a feature of economy in that they may be disassembled from gaging members when the latter are worn out or discarded for any other reason, and may then be reassembled with new gaging members, thus giving them, with reasonable care, practically indefinite life.

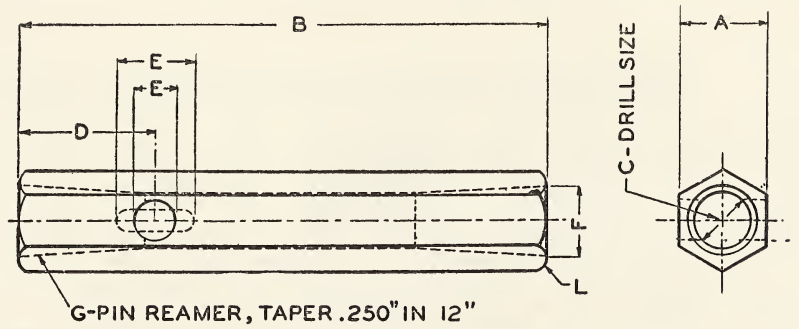
TABLE 1.—*Handles for plain cylindrical and thread plug gages, taper lock design, range above 0.059 to and including 0.240 inch*




| Handle size no. | Nominal range, thread plug diameters, inclusive | | Decimal range, plain and thread plug diameters | | General dimensions | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | From— | To— | Above— | To and including— | *A* | *B* | *C* Drill size | *D* | *E* | *F* | | *G* | *L* | *M* | |
| | | | | | | | | | | Min. | Max. | | | Min. | Max. |
| | *No.* | *No.* | *Inch* | *Inch* | *Inch* | *Inches* | | *Inch* | *Inch* | *Inch* | *Inch* | *No.* | *Inch* | *Inch* | *Inch* |
| 000 | 0 | 3 | 0. 059 | 0. 105 | 3/16 | 1½ | no. 34 (0. 111) | 9/16 | 5/64 by ¼ | 0. 125 | 0. 126 | 000 | 1/32 | 0. 172 | 0. 177 |
| 00 | 4 | 6 | . 105 | . 150 | ¼ | 1¾ | no. 29 (0. 136) | 5/8 | 3/32 by 5/16 | . 155 | . 156 | 0 | 1/32 | . 235 | . 240 |
| 0 | 8 | 12 | . 150 | . 240 | 5/16 | 2 | no. 20 (0. 161) | 11/16 | ⅛ by ⅜ | . 180 | . 181 | 2 | 1/32 | . 297 | . 302 |

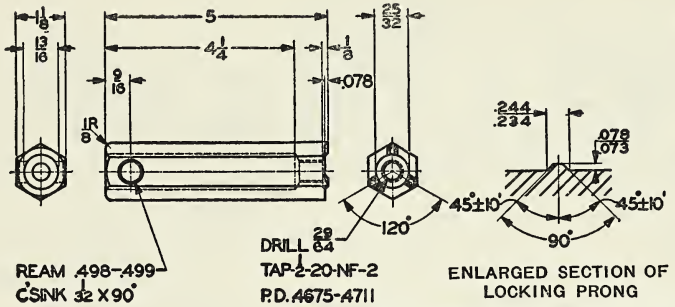
NOTE.—The purpose of the groove in the "not go" end of the handle is to distinguish the "not go" from the "go" end.

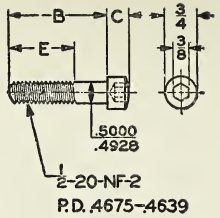
TABLE 2.—*Handles for plain cylindrical and thread plug gages, taper lock design, range above 0.240 to and including 1.510 inches*




| Handle size no. | Nominal range, thread plug diameters, inclusive | | Decimal range, plain and thread plug diameters | | General dimensions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | From— | To— | Above— | To and including— | *A* | *B* | *C* Drill size | *D* | *E* | *F* Min. | *F* Max. | *G* | *L* |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | | *Inches* | *Inch* | *Inch* | *Inch* | *No.* | *Inch* |
| 1 | ¼ | 5/16 | 0. 240 | 0. 365 | ⅜ | 2¾ | 7/32 | 25/32 | ⅛ by ½ | 0. 239 | 0. 240 | 4 | 1/16 |
| 2 | ⅜ | ½ | . 365 | . 510 | ½ | 3 | L (0. 290) | 25/32 | *Diameter* 15/64 | . 309 | . 310 | 6 | 1/16 |
| 3 | 9/16 | ¾ | . 510 | . 825 | 11/16 | 3¼ | 25/64 | 27/32 | 11/32 | . 409 | . 410 | 7 | 3/32 |
| 4 | ⅞ | 1⅛ | . 825 | 1. 135 | ⅞ | 3⅝ | 37/64 | 63/64 | ⅜ | . 609 | . 610 | 10 | 3/32 |
| 5 | 1¼ | 1½ | 1. 135 | 1. 510 | 1⅛ | 4 | 25/32 | 1⅛ | 7/16 | . 809 | . 810 | 11 | ⅛ |

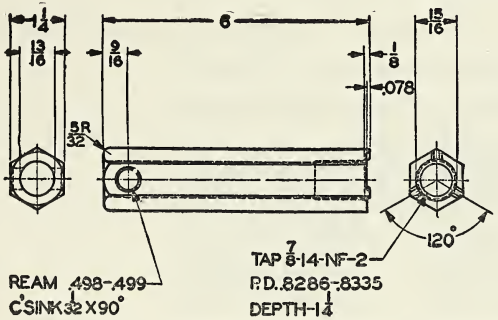
NOTE.—Taper lock handles are standard for all taper pipe thread plug gages up to and including 2-inch nominal pipe size (see table 10, p. 18).

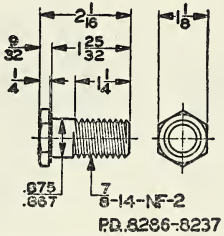


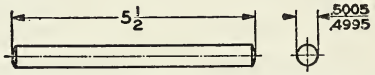

| Plug | B | C | E |
|---|---|---|---|
| | *Inches* | *Inch* | *Inches* |
| Not go | 1½ | ⅜ | 1¼ |
| Go | 2¼ | ½ | 1½ |
| Progressive | 3¼ | ½ | 2⅛ |

No. 6 handle. Range: Above 1.510 to and including 2.510 inches.

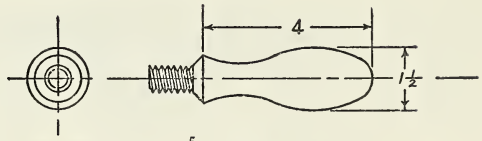



No. 7 handle. Range: Above 2.510 to and including 8.010 inches.



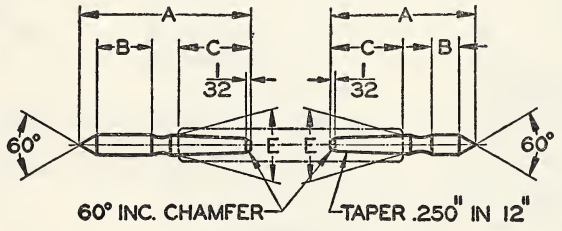

Cross bar, nos. 6 and 7 handles (optional).



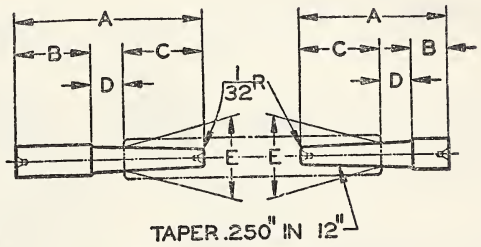

No. 8 handle (commercial no. 8 ball handle). Range: Above 8.010 to and including 12.010 inches.

FIGURE 2.—*Handles for plain cylindrical and thread plug gages, reversible design, range above 1.510 to and including 8.010 inches; and annular design, range above 8.010 to and including 12.010 inches.*

TABLE 3.—*Plain cylindrical plug gaging members, taper lock design, range above 0.059 to and including 0.240 inch*



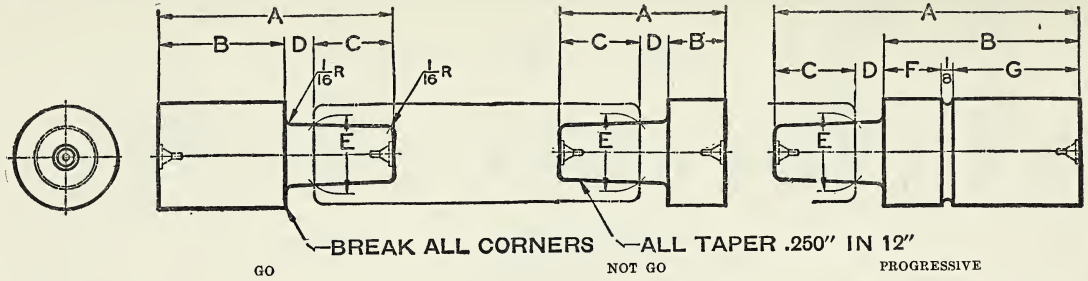

ABOVE 0.059 TO AND INCLUDING 0.150 INCH




ABOVE 0.150 TO AND INCLUDING 0.240 INCH

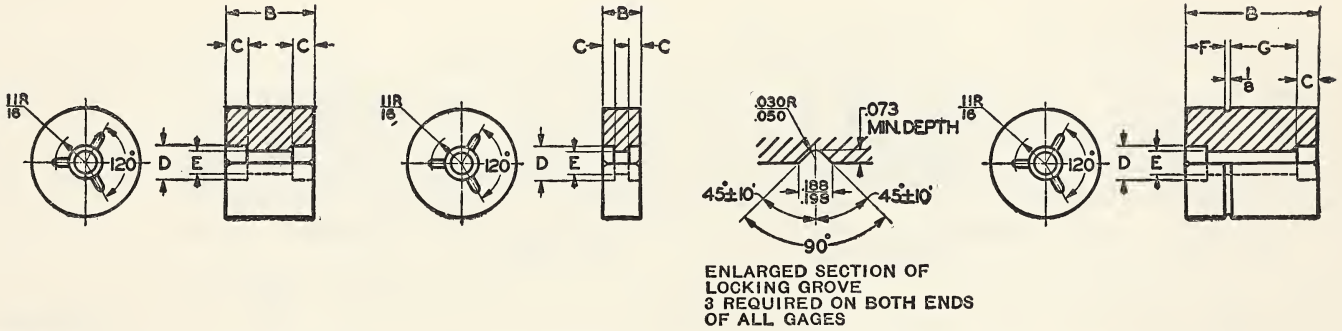
| Handle size no. | Range in diameters | | General dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Go | | | | | | Not go | | | | | |
| | Above— | To and including— | A | B | C | D | E | | A | B | C | D | E | |
| | | | | | | | Min. | Max. | | | | | Min. | Max. |
| | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| 000 | 0. 059 | 0. 105 | 1 5/32 | 3/8 | 1/2 | ------ | 0. 125 | 0. 126 | 31/32 | 3/16 | 1/2 | ------ | 0. 125 | 0. 126 |
| 00 | . 105 | . 150 | 1 11/32 | 7/16 | 9/16 | ------ | . 155 | . 156 | 1 1/8 | 7/32 | 9/16 | ------ | . 155 | . 156 |
| 0 | . 150 | . 240 | 1 15/32 | 19/32 | 5/8 | 1/4 | . 180 | . 181 | 1 5/32 | 9/32 | 5/8 | 1/4 | . 180 | . 181 |

TABLE 4.—*Plain cylindrical plug gaging members, taper lock design, range above 0.240 to and including 1.510 inches*



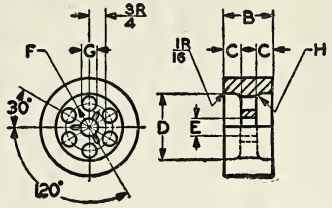

| Handle size no. | Range in diameters | | General dimensions | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Go | | | | | | Not go | | | | | | Progressive | | | | | | | |
| | | | | | | | E | | | | | | E | | | | | | E | | | |
| | Above | To and including | A | B | C | D | Min. | Max. | A | B | C | D | Min. | Max. | A | B | C | D | Min. | Max. | F | G |
| | *Inches* | *Inches* | *In.* | *In.* | *Inch* | *In.* | *Inch* | *Inch* | *Inches* | *In.* | *Inch* | *In.* | *Inch* | *Inch* | *Inches* | *Inches* | *Inch* | *In.* | *Inch* | *Inch* | *In.* | *Inches* |
| 1 | 0.240 | 0.365 | 1¾ | ¾ | ¾ | ¼ | 0.239 | 0.240 | 1 5/16 | 5/16 | ¾ | ¼ | 0.239 | 0.240 | 2 3/16 | 1 3/16 | ¾ | ¼ | 0.239 | 0.240 | 5/16 | ¾ |
| 2 | .365 | .510 | 2 | 1 | ¾ | ¼ | .309 | .310 | 1⅜ | ⅜ | ¾ | ¼ | .309 | .310 | 2½ | 1½ | ¾ | ¼ | .309 | .310 | ⅜ | 1 |
| 3 | .510 | .825 | 2¼ | 1¼ | ¾ | ¼ | .408 | .410 | 1½ | ½ | ¾ | ¼ | .408 | .410 | 2⅞ | 1⅞ | ¾ | ¼ | .408 | .410 | ½ | 1¼ |
| 4 | .825 | 1.135 | 2 9/16 | 1⅜ | ⅞ | 5/16 | .608 | .610 | 1 13/16 | ⅝ | ⅞ | 5/16 | .608 | .610 | 3 5/16 | 2⅛ | ⅞ | 5/16 | .608 | .610 | ⅝ | 1⅜ |
| 5 | 1.135 | 1.510 | 2⅞ | 1½ | 1 | ⅜ | .808 | .810 | 2⅛ | ¾ | 1 | ⅜ | .808 | .810 | 3¾ | 2⅜ | 1 | ⅜ | .808 | .810 | ¾ | 1½ |

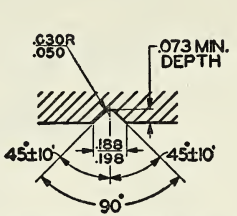
TABLE 5.—*Plain cylindrical plug gaging members, reversible design, range above 1.510 to and including 2.510 inches*



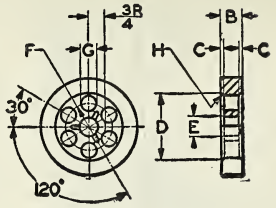

| Handle size no. | Plain plug diameters | | | | Go | | | | Not go | | | | Progressive | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal range, inclusive | | Decimal range | | *B* | *C* | *D* | *E* | *B* | *C* | *D* | *E* | *B* | *C* | *D* | *E* | *F* | *G* |
| | From— | To— | Above— | To and including— | | | | | | | | | | | | | | |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* |
| 6 | 1½ | 2 | 1. 510 | 2. 010 | 1⅞ | ½ | 25/32 | 17/32 | ⅞ | 9/32 | 25/32 | 17/32 | 2⅞ | ½ | 25/32 | 17/32 | ⅞ | 1⅞ |
| 6 | 2 | 2½ | 2. 010 | 2. 510 | 2 | ½ | 25/32 | 17/32 | ⅞ | 9/32 | 25/32 | 17/32 | 3 | ½ | 25/32 | 17/32 | ⅞ | 2 |

TABLE 6.—*Plain cylindrical plug gaging members, reversible design, range above 2.510 to and including 8.010 inches*



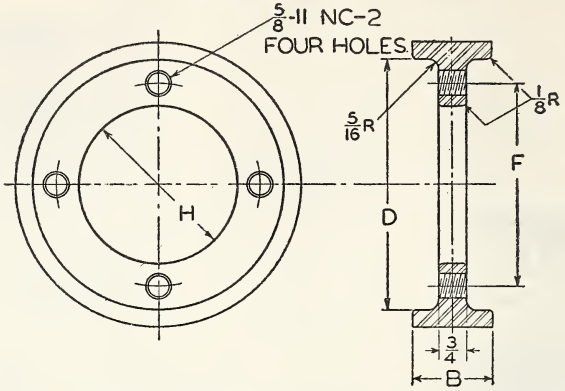




ENLARGED SECTION OF LOCKING GROOVE 3 REQUIRED ON BOTH ENDS OF ALL GAGES




| Handle size no. | Plain plug diameters | | | | Go | | | | | | | Not go | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal range, inclusive | | Decimal range | | *B* | *C* | *D* | *E* | *F* | *G* | *H* | *B* | *C* | *D* | *E* | *F* | *G* | *H* |
| | From— | To— | Above— | To and including— | | | | | | | | | | | | | | |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *Inches* | *Inch* | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inches* | *Inches* | *Inch* |
| 7 | 2½ | 3 | 2.510 | 3.010 | 2⅛ | 11/16 | 1⅞ | 29/32 | ----- | ----- | 5/16 | 1 | ⅛ | 1⅞ | 29/32 | ----- | ----- | 5/16 |
| 7 | 3 | 3½ | 3.010 | 3.510 | 2¼ | ¾ | 2¼ | 29/32 | ----- | ----- | 5/16 | 1 | ⅛ | 2¼ | 29/32 | ----- | ----- | 5/16 |
| 7 | 3½ | 4 | 3.510 | 4.010 | 2¼ | ¾ | 2⅝ | 29/32 | ----- | ----- | 5/16 | 1 | ⅛ | 2⅝ | 29/32 | ----- | ----- | 5/16 |
| 7 | 4 | 4½ | 4.010 | 4.510 | 2¼ | ¾ | 3 | 29/32 | 1 1/16 | ¾ | 5/16 | 1 | ⅛ | 3 | 29/32 | 1 1/16 | ¾ | 5/16 |
| 7 | 4½ | 5 | 4.510 | 5.010 | 2¼ | ¾ | 3 7/16 | 29/32 | 1 3/16 | 13/16 | 5/16 | 1 | ⅛ | 3 7/16 | 29/32 | 1 3/16 | 13/16 | 5/16 |
| 7 | 5 | 5½ | 5.010 | 5.510 | 2¼ | ¾ | 3⅞ | 29/32 | 1¼ | ⅞ | 5/16 | 1 | ⅛ | 3⅞ | 29/32 | 1¼ | ⅞ | 5/16 |
| 7 | 5½ | 6 | 5.510 | 6.010 | 2¼ | ¾ | 4 5/16 | 29/32 | 1⅜ | 1 | 5/16 | 1 | ⅛ | 4 5/16 | 29/32 | 1⅜ | 1 | 5/16 |
| 7 | 6 | 6½ | 6.010 | 6.510 | 2¼ | ¾ | 4¾ | 29/32 | 1½ | 1⅛ | 5/16 | 1 | ⅛ | 4¾ | 29/32 | 1½ | 1⅛ | 5/16 |
| 7 | 6½ | 7 | 6.510 | 7.010 | 2¼ | ¾ | 5¼ | 29/32 | 1⅝ | 1¼ | 5/16 | 1 | ⅛ | 5¼ | 29/32 | 1⅝ | 1¼ | 5/16 |
| 7 | 7 | 7½ | 7.010 | 7.510 | 2¼ | ¾ | 5¾ | 29/32 | 1¾ | 1⅜ | 5/16 | 1 | ⅛ | 5¾ | 29/32 | 1¾ | 1⅜ | 5/16 |
| 7 | 7½ | 8 | 7.510 | 8.010 | 2¼ | ¾ | 6¼ | 29/32 | 1⅞ | 1½ | 5/16 | 1 | ⅛ | 6¼ | 29/32 | 1⅞ | 1½ | 5/16 |

TABLE 7.—*Plain cylindrical plug gaging members, annular design, range above 8.010 to and including 12.010 inches*

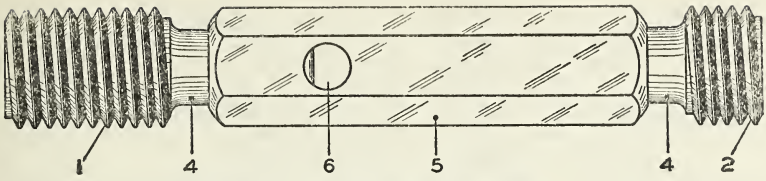



| Handle size no.[1] | Plain plug diameters | | | | B | | D | F | H |
|---|---|---|---|---|---|---|---|---|---|
| | Nominal range, inclusive | | Decimal range | | | | | | |
| | From— | To— | Above— | To and including— | Go | Not go | | | |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *Inches* | *Inches* | *Inches* |
| 8 | 8 | 8½ | 8. 010 | 8. 510 | 2¼ | 1 | 6½ | 5¼ | 4 |
| 8 | 8½ | 9 | 8. 510 | 9. 010 | 2¼ | 1 | 7 | 5⅝ | 4⅜ |
| 8 | 9 | 9½ | 9. 010 | 9. 510 | 2¼ | 1 | 7½ | 6 | 4¾ |
| 8 | 9½ | 10 | 9. 510 | 10. 010 | 2¼ | 1 | 8 | 6½ | 5⅛ |
| 8 | 10 | 10½ | 10. 010 | 10. 510 | 2¼ | 1 | 8½ | 7 | 5½ |
| 8 | 10½ | 11 | 10. 510 | 11. 010 | 2¼ | 1 | 9 | 7½ | 5⅞ |
| 8 | 11 | 11½ | 11. 010 | 11. 510 | 2¼ | 1 | 9½ | 8 | 6¼ |
| 8 | 11½ | 12 | 11. 510 | 12. 010 | 2¼ | 1 | 10 | 8½ | 6⅝ |

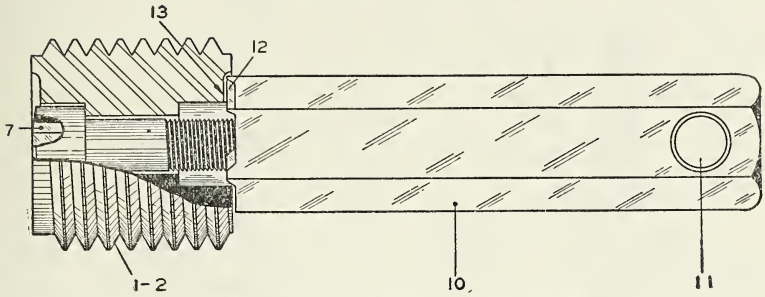
[1] 2 required.

## THREAD PLUG GAGE BLANKS

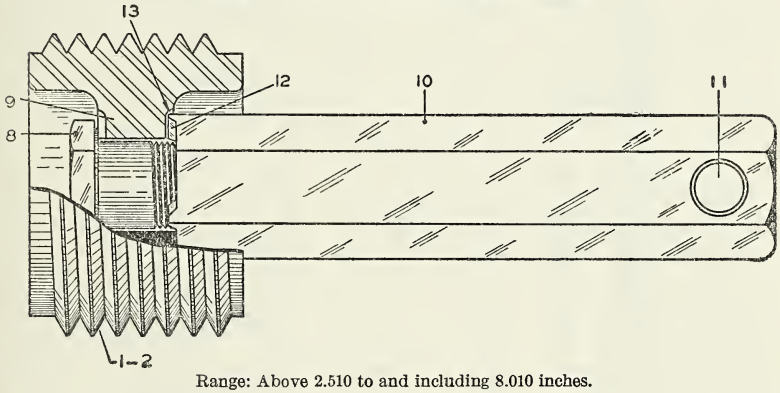
The taper lock, reversible, and annular designs have been adopted for thread plug gage blanks and handles and follow the plain cylindrical plug gage designs described on pages 3 to 6 with the exception that the length of thread-gaging members is slightly different in some instances and the use of taper lock blanks and handles for pipe-thread plug gages is standard to and including 2 inches nominal pipe size. General details of construction will be apparent from figure 3. Data sheets for thread plug gages are presented in tables 8 to 13. A separate table specifying the taper lock handles and gaging members for pipe-thread plug gages is set forth on page 18.



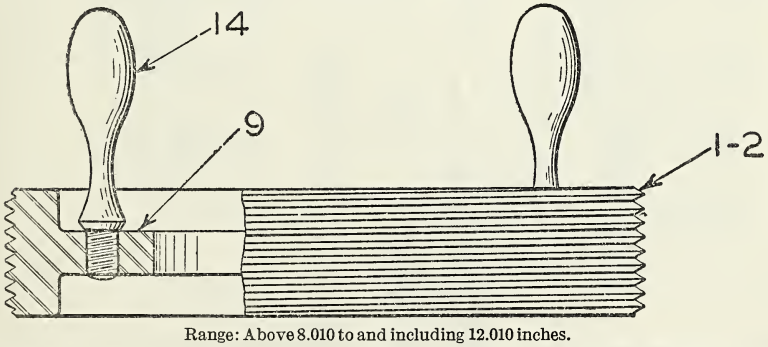

Range: No 0 to and including 1.510 inches.




Range: Above 1.510 to and including 2.510 inches.




Range: Above 2.510 to and including 8.010 inches.

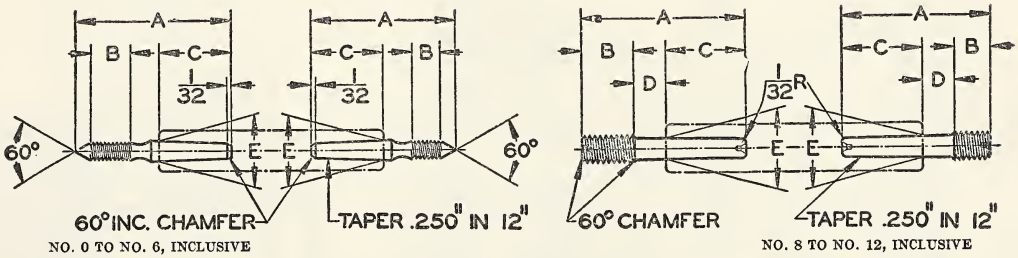



Range: Above 8.010 to and including 12.010 inches.

FIGURE 3.—*American Gage Design Standard thread plug gages, details of construction.*

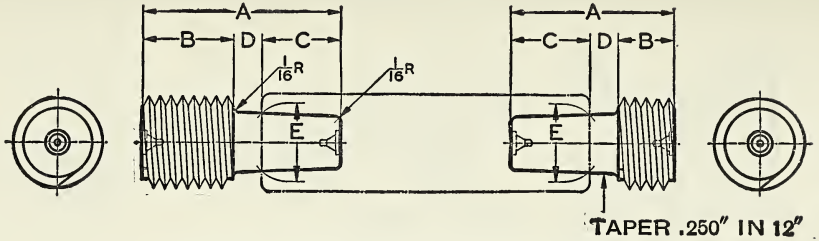
1. "Go" gaging member
2. "Not go" gaging member
4. Shank
5. Taper lock handle
6. Drift hole (or slot)
7. Socket head screw
8. Hexagon head screw
9. Web
10. Handle for reversible gage
11. Cross-pin hole
12. Locking prong
13. Locking groove
14. Ball handle

TABLE 8.—*Thread plug gaging members, taper lock design, range no. 0 to no. 12, inclusive*




| Handle size no. | Range, thread plug diameters | | | | General dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal, inclusive | | Decimal | | Go | | | | | | Not go | | | | | |
| | From— | To— | Above— | To and including— | A | B | C | D | E | | A | B | C | D | E | |
| | | | | | | | | | Min. | Max. | | | | | Min. | Max. |
| | *No.* | *No.* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| 000 | 0 | 3 | 0.059 | 0.105 | 1 1/32 | 1/4 | 1/2 | ------ | 0.125 | 0.126 | 31/32 | 3/16 | 1/2 | ------ | 0.125 | 0.126 |
| 00 | 4 | 6 | .105 | .150 | 1 7/32 | 5/16 | 9/16 | ------ | .155 | .156 | 1 1/8 | 7/32 | 9/16 | ------ | .155 | .156 |
| 0 | 8 | 12 | .150 | .240 | 1 9/32 | 13/32 | 5/8 | 1/4 | .180 | .181 | 1 5/32 | 9/32 | 5/8 | 1/4 | .180 | .181 |

TABLE 9.—*Thread plug gaging members, taper lock design, range ¼ to 1½ inches, inclusive*

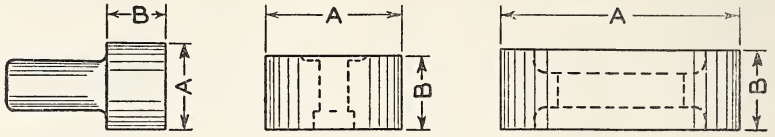



Not less than three full threads must remain on "Not go" plug.

| Handle size No. | Range | | | | | General dimensions | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Thread plug diameters | | | | Threads per inch | Go | | | | | | Not go | | | | | |
| | Nominal range, inclusive | | Decimal range | | | A | B | C | D | E | | A | B | C | D | E | |
| | From— | To— | Above— | To and including— | | | | | | Min. | Max. | | | | | Min. | Max. |
| | *Inches* | *Inches* | *Inches* | *Inches* | | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| 1 | ¼ | 5/16 | 0. 240 | 0. 365 | | 1½ | ½ | ¾ | ¼ | 0. 239 | 0. 240 | 1 5/16 | 5/16 | ¾ | ¼ | 0. 239 | 0. 240 |
| 2 | ⅜ | ½ | . 365 | . 510 | | 1¾ | ¾ | ¾ | ¼ | . 309 | . 310 | 1⅜ | ⅜ | ¾ | ¼ | . 309 | . 310 |
| 3 | 9/16 | ¾ | . 510 | . 825 | | 1⅞ | ⅞ | ¾ | ¼ | . 408 | . 410 | 1½ | ½ | ¾ | ¼ | . 408 | . 410 |
| 4 | ⅞ | 1⅛ | . 825 | 1. 135 | | 2 3/16 | 1 | ⅞ | 5/16 | . 608 | . 610 | 1 13/16 | ⅝ | ⅞ | 5/16 | . 608 | . 610 |
| 5 | 1¼ | 1½ | 1. 135 | 1. 510 | Coarser than 12 | 2⅝ | 1¼ | 1 | ⅜ | . 808 | . 810 | 2⅛ | ¾ | 1 | ⅜ | . 808 | . 810 |
| 5 | 1¼ | 1½ | 1. 135 | 1. 510 | 12 and finer | 2⅜ | 1 | 1 | ⅜ | . 808 | . 810 | 2⅛ | ¾ | 1 | ⅜ | . 808 | . 810 |

NOTE.—Taper lock gaging members are standard for all taper pipe thread plug gages up to and including 2 inch nominal pipe size (see table 12, p. 20).

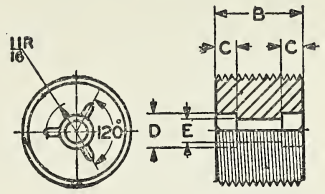
TABLE 10.—*Pipe thread plug gaging members, range ⅛ to 8 inches, inclusive*



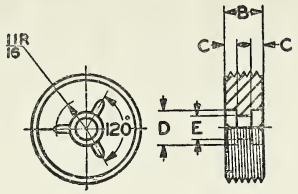

Taper lock gaging members and handles are standard for pipe thread plug gages to and including 2 inches nominal pipe size. The general dimensions of handles and gaging members which are referred to in this table are given in tables 2, 9, 11, 12, and 13 and figure 2.

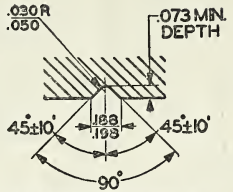
| Nominal pipe size | Handle size no. | Type blank | A | B |
|---|---|---|---|---|
| *Inches* | | | *Inches* | *Inches* |
| ⅛ | 2 | Taper lock | 7/16 | 0.310 |
| ¼ | 3 | do | 9/16 | .450 |
| ⅜ | 3 | do | 11/16 | .460 |
| ½ | 4 | do | 7/8 | .580 |
| ¾ | 4 | do | 1 1/16 | .600 |
| 1 | 5 | do | 1 3/8 | .740 |
| 1¼ | 5 | do | 1 11/16 | .770 |
| 1½ | 5 | do | 1 15/16 | .790 |
| 2 | 5 | do | 2 7/16 | .830 |
| 2½ | 6 | Reversible | 2 15/16 | 1.210 |
| 3 | 6 | do | 3 9/16 | 1.300 |
| 3½ | 7 | do | 4 1/16 | 1.350 |
| 4 | 7 | do | 4 9/16 | 1.425 |
| 4½ | 7 | do | 5 1/16 | 1.475 |
| 5 | 7 | do | 5 5/8 | 1.550 |
| 6 | 7 | do | 6¾ | 1.700 |
| 8 | 8 | Annular | 8¾ | 1.900 |

TABLE 11.—*Thread plug gaging members, reversible design, range above 1½ to and including 2½ inches*

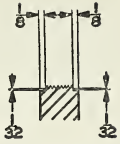



NOT LESS THAN THREE FULL THREADS MUST REMAIN ON "NOT GO" PLUG.



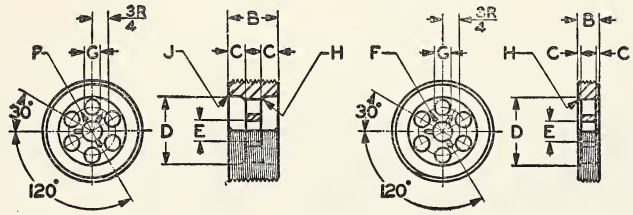

ENLARGED SECTION OF INTERNAL LOCKING MEMBER 3 REQUIRED ON BOTH ENDS OF ALL GAGES.



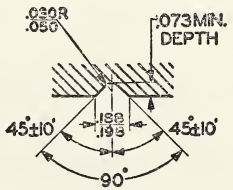

"NOT GO" GAGES 16 T.P.I. & FINER RELIEVED ON BOTH ENDS 32 BELOW SHARP ROOT OF THD. AS SHOWN.

| Handle size no. | Range, thread plug diameters | | Go | | | | | | | | | | | | Not go | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Above— | To and including— | 7 threads per inch and coarser | | | | Finer than 7 threads per inch and coarser than 16 | | | | 16 threads per inch and finer | | | | All pitches | | | |
| | | | *B* | *C* | *D* | *E* | *B* | *C* | *D* | *E* | *B* | *C* | *D* | *E* | *B* | *C* | *D* | *E* |
| | *Inches* | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| 6 | 1.510 | 2.010 | 1 7/8 | 1/2 | 25/32 | 17/32 | 1 1/4 | 3/8 | 25/32 | 17/32 | 7/8 | 9/32 | 25/32 | 17/32 | 7/8 | 9/32 | 25/32 | 17/32 |
| 6 | 2.010 | 2.510 | 2 | 1/2 | 25/32 | 17/32 | 1 3/8 | 3/8 | 25/32 | 17/32 | 7/8 | 9/32 | 25/32 | 17/32 | 7/8 | 9/32 | 25/32 | 17/32 |

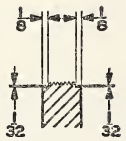
TABLE 12.—*Thread plug gaging members, reversible design, range above 2½ to and including 4½ inches*




NOT LESS THAN THREE FULL THREADS MUST REMAIN ON "NOT GO" PLUG.



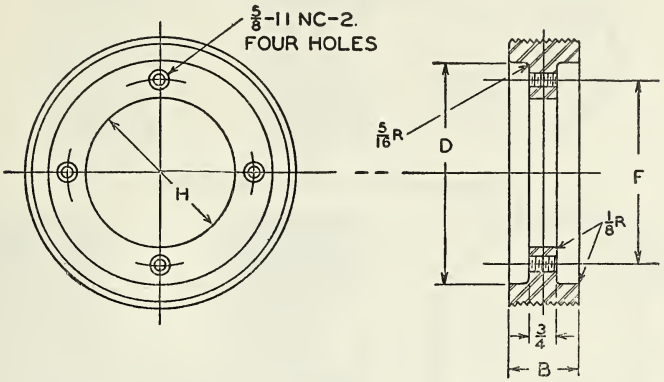

ENLARGED SECTION OF LOCKING GROOVE 3 REQUIRED ON BOTH ENDS OF ALL GAGES.




"NOT GO" GAGES 18 T.P.I. & FINER RELIEVED ON BOTH ENDS 1/32 BELOW SHARP ROOT OF THRD AS SHOWN.

| Handle size no. | Thread plug diameters | | | | Go | | | | | | | | | | | Not go | | | All | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal range, inclusive | | Decimal range | | 7 threads per inch and coarser | | | | Finer than 7 threads per inch and coarser than 16 | | | | 16 threads per inch and finer | | | All pitches | | | All pitches | | | |
| | From— | To— | Above— | To and including— | B | C | H | J | B | C | H | J | B | C | H | B | C | H | D | E | F | G |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inches* | *Inches* |
| 7 | 2½ | 3 | 2.510 | 3.010 | 2⅛ | 11/16 | 3/16 | 1/16 | 1½ | 3/8 | 3/16 | 1/16 | 1 | 1/8 | 3/16 | 1 | 1/8 | 3/16 | 1⅞ | 29/32 | ----- | ---- |
| 7 | 3 | 3½ | 3.010 | 3.510 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 2¼ | 29/32 | ----- | ---- |
| 7 | 3½ | 4 | 3.510 | 4.010 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 2⅝ | 29/32 | ----- | ---- |
| 7 | 4 | 4½ | 4.010 | 4.510 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 3 | 29/32 | 1 1/16 | ¾ |
| 7 | 4½ | 5 | 4.010 | 5.010 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 3 7/16 | 29/32 | 1 3/16 | 13/16 |
| 7 | 5 | 5½ | 5.010 | 5.510 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 3⅞ | 29/32 | 1¼ | ⅞ |
| 7 | 5½ | 6 | 5.510 | 6.010 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 4 5/16 | 29/32 | 1⅜ | 1 |
| 7 | 6 | 6½ | 6.010 | 6.510 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 4¾ | 29/32 | 1½ | 1⅛ |
| 7 | 6½ | 7 | 6.510 | 7.010 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 5¼ | 29/32 | 1⅝ | 1¼ |
| 7 | 7 | 7½ | 7.010 | 7.510 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 5¾ | 29/32 | 1¾ | 1⅜ |
| 7 | 7½ | 8 | 7.510 | 8.010 | 2¼ | ¾ | 5/16 | 1/16 | 1½ | ⅜ | ¼ | 1/16 | 1 | ⅛ | 3/16 | 1 | ⅛ | 3/16 | 6¼ | 29/32 | 1⅞ | 1½ |

TABLE 13.—*Thread plug gaging members, annular design, range above 8 to and including 12 inches*



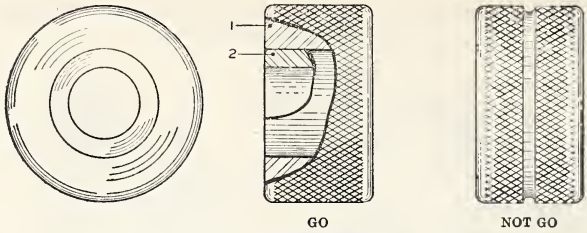

| Handle size no.[1] | Thread plug diameters | | | | Go | | | Not go | All | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal range, inclusive | | Decimal range | | 7 threads per inch and coarser | Finer than 7 threads per inch and coarser than 16 | 16 threads per inch and finer | All pitches | All pitches | | |
| | From— | To— | Above— | To and including— | *B* | *B* | *B* | *B* | *D* | *F* | *H* |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *Inch* | *Inches* | *Inches* | *Inches* |
| 8 | 8 | 8½ | 8. 010 | 8. 510 | 2¼ | 1½ | 1 | 1 | 6½ | 5¼ | 4 |
| 8 | 8½ | 9 | 8. 510 | 9. 010 | 2¼ | 1½ | 1 | 1 | 7 | 5⅝ | 4⅜ |
| 8 | 9 | 9½ | 9. 010 | 9. 510 | 2¼ | 1½ | 1 | 1 | 7½ | 6 | 4¾ |
| 8 | 9½ | 10 | 9. 510 | 10. 010 | 2¼ | 1½ | 1 | 1 | 8 | 6½ | 5⅛ |
| 8 | 10 | 10½ | 10. 010 | 10. 510 | 2¼ | 1½ | 1 | 1 | 8½ | 7 | 5½ |
| 8 | 10½ | 11 | 10. 510 | 11. 010 | 2¼ | 1½ | 1 | 1 | 9 | 7½ | 5⅞ |
| 8 | 11 | 11½ | 11. 010 | 11. 510 | 2¼ | 1½ | 1 | 1 | 9½ | 8 | 6¼ |
| 8 | 11½ | 12 | 11. 510 | 12. 010 | 2¼ | 1½ | 1 | 1 | 10 | 8½ | 6⅝ |

[1] 2 required.

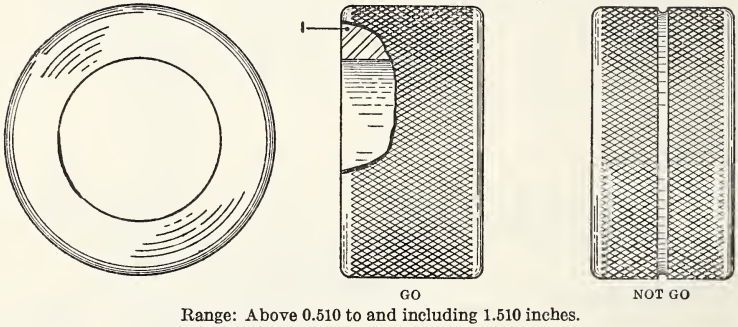
## PLAIN RING GAGE BLANKS

The use of the solid ring-gage design for external size control, being fairly well established, the committee's work on plain ring gages was concerned chiefly with matters of proportion. In the smaller sizes of plain ring gages it was felt desirable to employ a hardened bushing pressed into a soft gage body, in place of the one-piece ring gage, and this design has been adopted in the range above 0.059 to and including 0.510 inch. The single piece gage is employed in all cases above 0.510 inch, but gages in sizes above 1.510 inches are flanged, in order to eliminate unnecessary weight and facilitate handling. General details of construction are shown in figure 4, and dimensions are given in tables 14 and 15.

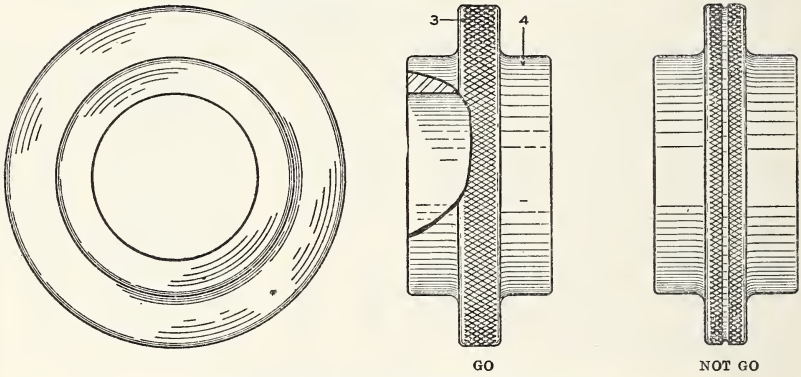
No dimensional difference exists between "go" and "not go" blanks of identical size range, but an annular groove is provided in the periphery of "not go" blanks as a means of identification.



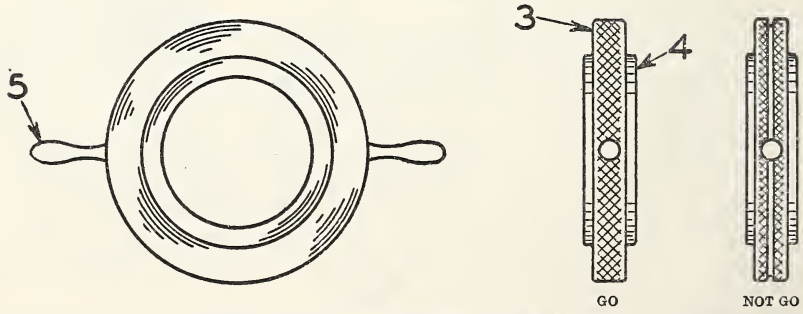

Range: Above 0.059 to and including 0.510 inch.




Range: Above 0.510 to and including 1.510 inches.




Range: Above 1.510 to and including 5.510 inches.

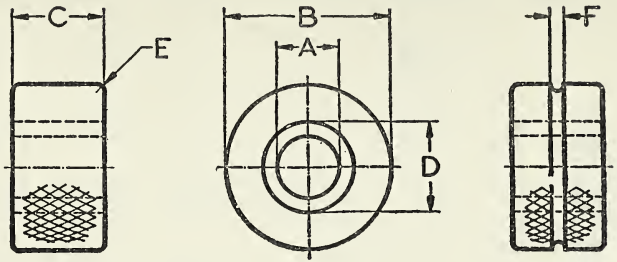



Range: Above 5.510 to and including 12.260 inches.

FIGURE 4.—*American Gage Design Standard plain ring gages, details of construction.*

1. Body.
2. Bushing.
3. Flange.
4. Hub.
5. Handle.

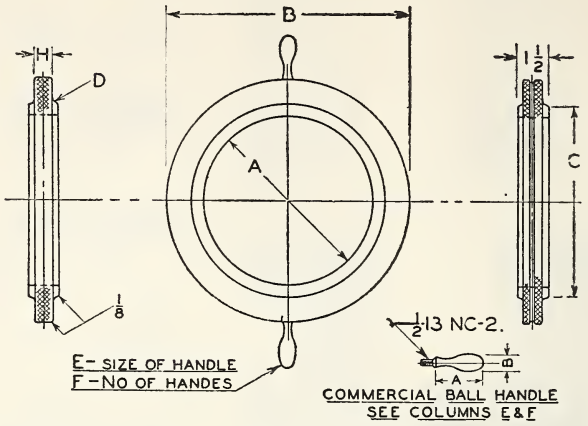
TABLE 14.—*Plain ring gages, range above 0.059 to and including 1.510 inches*




| Ring size no. | A Range | | General dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Above— | To and including— | B Outside diameter | C Thickness | D Bushing diameter | E Radius | F "Not go" groove width | Length of bushing |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | |
| 00 | 0. 059 | 0. 150 | 15/16 | 3/16 | 3/8 | 1/32 | 1/32 | (1) |
| 0 | . 150 | . 240 | 15/16 | 3/8 | 7/16 | 1/32 | 1/16 | (1) |
| 1 | . 240 | . 365 | 1 1/8 | 9/16 | 9/16 | 1/16 | 3/32 | (1) |
| 2 | . 365 | . 510 | 1 3/8 | 3/4 | 3/4 | 1/16 | 3/32 | (1) |
| 3 | . 510 | . 825 | 1 3/4 | 15/16 | (2) | 3/32 | 3/32 | (2) |
| 4 | . 825 | 1. 135 | 2 1/8 | 1 1/8 | (2) | 3/32 | 3/32 | (2) |
| 5 | 1. 135 | 1. 510 | 2 1/2 | 1 5/16 | (2) | 3/32 | 3/32 | (2) |

[1] Bushings are 1/16 inch longer than ring thickness, but are ground flush after hole is finished.
[2] Sizes 3, 4, and 5 are solid.

TABLE 15.—*Plain ring gages, range above 1.510 to and including 12.260 inches*




| Ring size no. | A Range | | General dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Above— | To and including— | B Outside diameter | C Hub diameter | D Radius | E Size of handle | F Number of handles | H Flange thickness |
| | *Inches* | *Inches* | *Inches* | *Inches* | *Inch* | *No.* | | *Inch* |
| 6 | 1.510 | 2.010 | 4 | A+ 7/8 | 1/8 | ------ | ------ | 1/2 |
| 7 | 2.010 | 2.510 | 4 1/2 | A+ 7/8 | 1/8 | ------ | ------ | 9/16 |
| 8 | 2.510 | 3.010 | 5 | A+1 | 5/32 | ------ | ------ | 5/8 |
| 9 | 3.010 | 3.510 | 5 1/2 | A+1 | 5/32 | ------ | ------ | 11/16 |
| 10 | 3.510 | 4.010 | 6 3/8 | A+1 1/8 | 5/32 | ------ | ------ | 3/4 |
| 11 | 4.010 | 4.760 | 7 1/4 | A+1 1/8 | 5/32 | ------ | ------ | 7/8 |
| 12 | 4.760 | 5.510 | 8 1/4 | A+1 1/8 | 3/16 | ------ | ------ | 1 |
| 13 | 5.510 | 6.260 | 9 1/4 | A+1 1/8 | 3/16 | 6 | 2 | 1 |
| 14 | 6.260 | 7.010 | 10 1/4 | A+1 1/8 | 3/16 | 6 | 2 | 1 |
| 15 | 7.010 | 7.760 | 11 1/4 | A+1 1/8 | 3/16 | 6 | 2 | 1 |
| 16 | 7.760 | 8.510 | 12 1/4 | A+1 1/8 | 3/16 | 6 | 2 | 1 |
| 17 | 8.510 | 9.260 | 13 1/4 | A+1 1/8 | 3/16 | 7 | 4 | 1 |
| 18 | 9.260 | 10.010 | 14 1/4 | A+1 1/8 | 3/16 | 7 | 4 | 1 |
| 19 | 10.010 | 10.760 | 15 1/4 | A+1 1/8 | 3/16 | 7 | 4 | 1 |
| 20 | 10.760 | 11.510 | 16 1/4 | A+1 1/8 | 3/16 | 7 | 4 | 1 |
| 21 | 11.510 | 12.260 | 17 1/4 | A+1 1/8 | 3/16 | 7 | 4 | 1 |

HANDLE DIMENSIONS

| Handle no. | A | B |
|---|---|---|
| 6 | 3 3/8 | 1 1/4 |
| 7 | 3 3/4 | 1 3/8 |

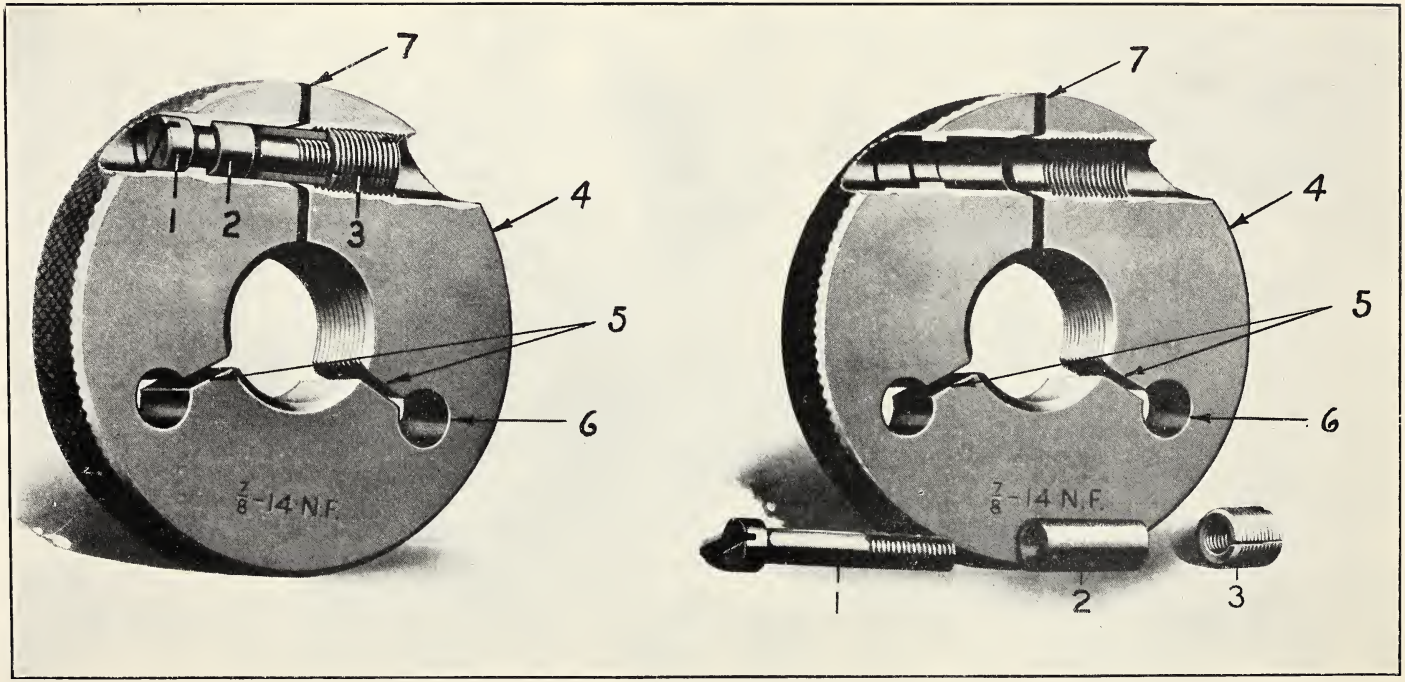



FIGURE 5.—*American Gage Design Standard thread ring gage locking device, details of construction, range no. 0 to 5½ inches, inclusive.*

1, Locking screw; 2, Sleeve; 3, Adjusting Screw; 4, Body; 5, Adjusting slot (one slot in range no. 0 to 5/16 inch, two slots in range 3/8 inch and larger); 6, Adjusting slot terminal hole; 7, Locking slot.

Gages in sizes above 5.510 inches are provided with ball handles.

In designing the large plain and thread ring gage blanks, the general outside and over-all dimensions were made identical for both types of blanks so that one set of dies could be utilized to make upset forgings for both types of gages.

## THREAD RING GAGE BLANKS

The committee found universal accord as to the superiority of the adjustable thread ring gage over the solid type, with the result that all American Gage Design Standard thread ring gage blanks are equipped with an effective device for adjusting and locking the gage in the manufacturing or resizing processes. Of the many locking devices considered the single-unit locking device was finally adopted as standard, as it permits a minimum diameter of blank for a given size range, and provides a simple adjustment and positive lock without introducing any mechanical stresses into the gage body which might tend to create distortion after setting. Referring to figure 5, the construction and operation of this device is as follows:

The adjusting screw, *3*, is threaded externally and internally and split longitudinally. Turning this screw to the right exerts pressure on the sleeve, *2*, against the shoulder in the left-hand side of the gage here shown, thus spreading the ring. Once the ring has been properly adjusted by means of adjusting screw, *3*, the adjustment is locked by tightening locking screw, *1*. The tightening of locking screw, *1*, exerts a pull between the shoulder immediately under its head and the internal threads of the adjusting screw, *3*, which causes the adjusting screw to expand into the threads in the wall of the gage, the thrust of this action being taken up longitudinally by the sleeve, *2*. Therefore, the clamping is accomplished by expansion of the adjusting screw equally in all directions and not by the application of any eccentric forces that tend to distort the gage or upset the adjustment. The locking pressure, it is seen, is taken up centrally in the locking screw itself as the reacting support is directly under the head of the locking screw in the form of a shoulder in the gage. The sleeve, *2*, being accurately fitted, serves as a large dowel to maintain the alignment of the gage.

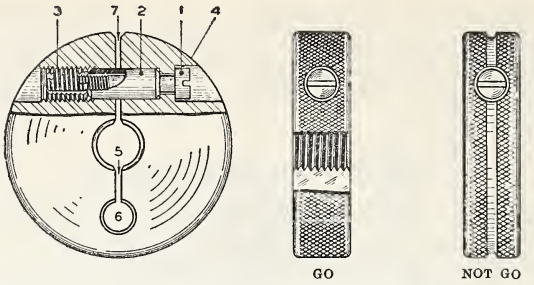
Dimensions for thread ring gage blanks in the range from no. 0 to 12¼ inches, inclusive, and of parts for the thread ring gage locking device, are given in tables 16, 17, 18, 19, and 20.

Five types of thread ring gage blanks have been provided as illustrated in figure 6, namely:

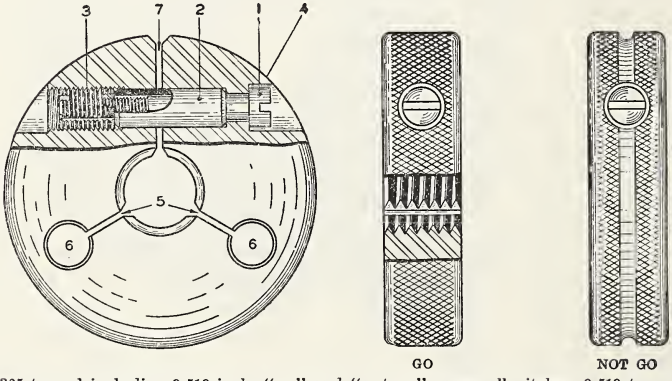
1. A thin flat disk type with one adjusting slot for all diameters and pitches, both "go" and "not go", no. 0 to 5/16 inch, inclusive.

2. A thin flat disk type with two adjusting slots for the following: (*a*) All diameters and pitches, "go" and "not go", above 5/16 to and including ½ inch; (*b*) fine pitches,[1] "go" and "not go", above ½ to and including 5½ inches; (*c*) coarse pitches, "not go" only, above ½ to and including 5½ inches.

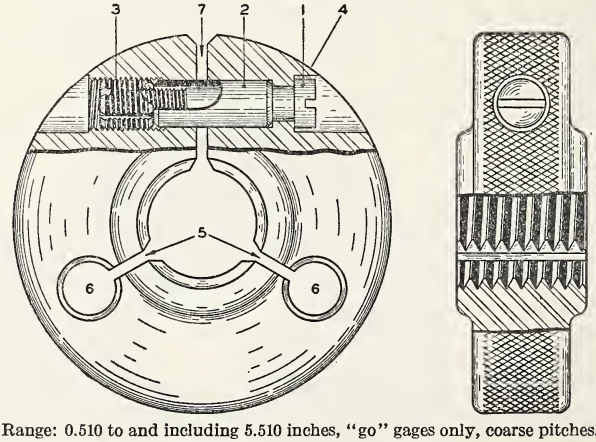
[1] Specific information as to the meaning of the terms "fine pitches" and "coarse pitches," as used above, is given in the footnote to table 16, p. 29.




Range: No. 0 to and including 0.365 inch, "go" and "not go" gages, all pitches.



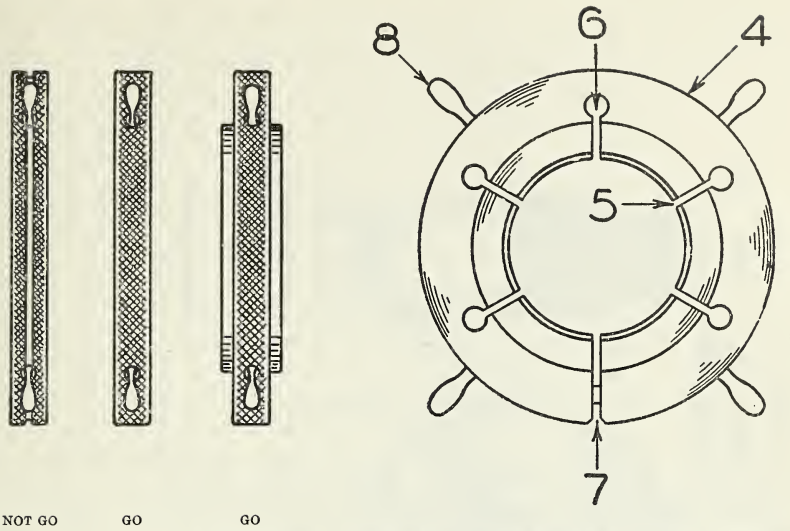

Range: 0.365 to and including 0.510 inch, "go" and "not go" gages, all pitches; 0.510 to and including 5.510 inches, "go" and "not go" gages, fine pitches; 0.510 to and including 5.510 inches, "not go" gages only, coarse pitches.




Range: 0.510 to and including 5.510 inches, "go" gages only, coarse pitches.

FIGURE 6.—*American Gage Design Standard thread ring gages, details of construction*—(Continued on page 27).

1. Locking screw
2. Sleeve
3. Adjusting screw
4. Body
5. Adjusting slot
6. Adjusting slot terminal hole
7. Locking slot
8. Ball Handle




Range: 5.510 to and including 12.260 inches. Thick blank for coarse pitches, "go" gages. Thin blank for fine pitches, "go" gages, and all "not go" gages.

FIGURE 6.—*American Gage Design Standard thread ring gages, details of construction*—Concluded.

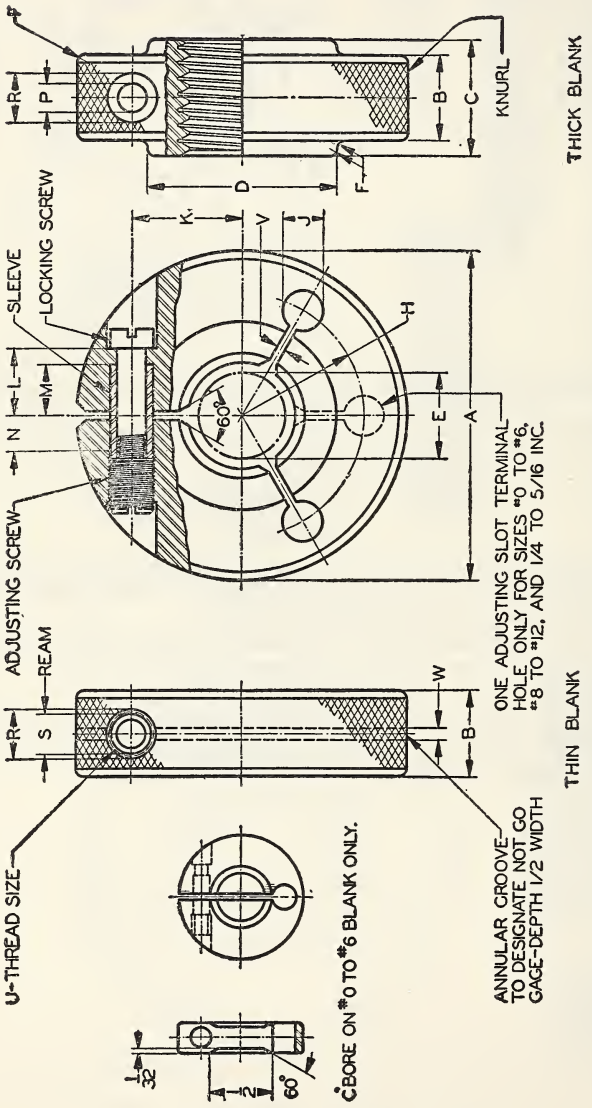
1. Locking screw
2. Sleeve
3. Adjusting screw
4. Body
5. Adjusting slot
6. Adjusting slot terminal hole
7. Locking slot
8. Ball handle

3. A thick flanged type with two adjusting slots for all "go" coarse pitch gages, above ½ to and including 5½ inches.

4. A thin flat type provided with ball handles and with a plurality of adjusting slots for all fine pitch "go" gages and all "not go" gages in the range above 5.510 to and including 12.260 inches.

5. A thick flanged type provided with ball handles and a plurality of adjusting slots for all coarse pitch "go" gages in the range 4.760 to and including 12.260 inches.

TABLE 16.—*Thread ring gages, range no. 0 to 4¾ inches, inclusive*



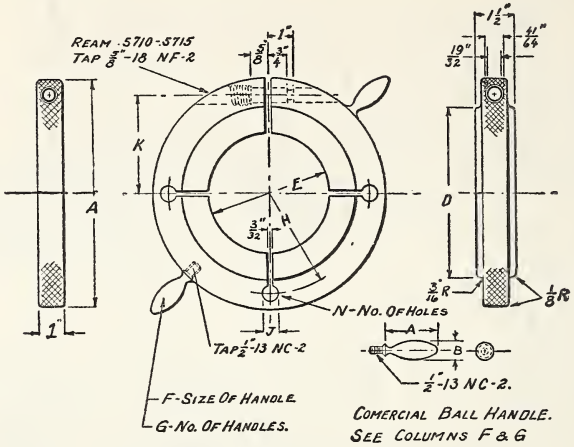
| Nominal range, inclusive | Decimal range, above and including— | General dimensions | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *A* | *B* | *C* | *D* | *E* | *F* | *H* | *J* | *K* | *L* | *M* | *N* | *P* Drill size | *R* Drill size | S Ream | | U | | | *V* | *W* |
| | | | | | | | | | | | | | | | | Min. | Max. | Size | Pitch diameter | | | |
| | | | | | | | | | | | | | | | | | | | Min. | Max. | | |
| | *Inches* | *Inches* | *Inch* | *Inches* | *Inches* | *Inches* | *Inch* | *Inches* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | | | *Inch* | *Inch* | | *Inch* | *Inch* | *Inch* | *Inch* |
| Nos. 0 to 6 | 0.059 | 1 | 1/4 | | | | 1/32 | 5/16 | 5/32 | 5/16 | 7/32 | 5/32 | 1/16 | No. 41 (0.0960) | 1 1/64 (0.1719) | 0.1370 | 0.1373 | No. 8–36 | 0.1460 | 0.1478 | 0.010 (1) | 1/32 |
| | .150 | | | | | | | | | | | | | | | | | | | | | |
| Nos. 8 to 12 | .150 | 1 | 1/4 | | | | 1/32 | 5/16 | 5/32 | 5/16 | 7/32 | 5/32 | 1/16 | No. 41 (0.0960) | 1 1/64 (0.1719) | .1370 | .1373 | No. 8–36 | .1460 | .1478 | 1/64 | 1/32 |
| | .240 | | | | | | | | | | | | | | | | | | | | | |
| 1/4 to 5/16 | .240 | 1 3/8 | 1 1/32 | | | 5/32 | 1/32 | 7/16 | 3/16 | 3/8 | 1 1/32 | 1/4 | 1/8 | No. 31 (0.1200) | 7/32 (0.2187) | .1810 | .1813 | No. 12–28 | .1928 | .1950 | 1/32 | 1/16 |
| | .365 | | | | | | | | | | | | | | | | | | | | | |
| 3/8 to 1/2 | .365 | 1 3/4 | 7/16 | | | 3/16 | 3/64 | 19/32 | 1/4 | 15/32 | 1/2 | 3/8 | 3/16 | No. 25 (0.1495) | 1 7/64 (0.2656) | .2150 | .2153 | 1/4–28 | .2268 | .2290 | 1/32 | 3/32 |
| | .510 | | | | | | | | | | | | | | | | | | | | | |
| 9/16 to 3/4 | .510 | 2 3/16 | 9/16 | 3/4 | 1 1/16 | 1 1/32 | 1/16 | 3/4 | 5/16 | 1 1/16 | 1 7/32 | 1 3/32 | 7/32 | No. 7 (0.2010) | 2 1/64 (0.3281) | .2720 | .2723 | 5/16–24 | .2854 | .2878 | 1/16 | 3/32 |
| | .825 | | | | | | | | | | | | | | | | | | | | | |
| 7/8 to 1 1/8 | .825 | 2 5/8 | 1 1/16 | 1 5/16 | 1 1/2 | 9/16 | 1/16 | 3 1/32 | 5/16 | 7/8 | 1 7/32 | 1 3/32 | 9/32 | No. 1 (0.2280) | 2 5/64 (0.3906) | .3340 | .3344 | 3/8–24 | .3479 | .3503 | 1/16 | 3/32 |
| | 1.135 | | | | | | | | | | | | | | | | | | | | | |
| 1 1/4 to 1 1/2 | 1.135 | 3 1/4 | 3/4 | 1 1/8 | 1 7/8 | 2 7/32 | 1/16 | 1 3/16 | 3/8 | 1 1/8 | 5/8 | 7/16 | 5/16 | 17/64 (0.2656) | 2 9/64 (0.4531) | .3890 | .3894 | 7/16–20 | .4050 | .4076 | 1/16 | 3/32 |
| | 1.510 | | | | | | | | | | | | | | | | | | | | | |
| 1 5/8 to 2 | 1.510 | 3 3/4 | 1 3/16 | 1 1/4 | 2 3/8 | 1 3/16 | 3/32 | 1 7/16 | 3/8 | 1 3/8 | 5/8 | 7/16 | 5/16 | 17/64 (0.2656) | 2 9/64 (0.4531) | .3890 | .3894 | 7/16–20 | .4050 | .4076 | 1/16 | 1/8 |
| | 2.010 | | | | | | | | | | | | | | | | | | | | | |
| 2 1/8 to 2 1/2 | 2.010 | 4 1/2 | 7/8 | 1 5/16 | 2 7/8 | 1 1 9/32 | 3/32 | 1 3/4 | 7/16 | 1 1 1/16 | 1 3/16 | 9/16 | 7/16 | 21/64 (0.3281) | 3 3/64 (0.5156) | .4510 | .4515 | 1/2–20 | .4675 | .4701 | 3/32 | 1/8 |
| | 2.510 | | | | | | | | | | | | | | | | | | | | | |
| 2 5/8 to 3 | 2.510 | 5 | 7/8 | 1 3/8 | 3 3/8 | 2 | 3/32 | 2 | 7/16 | 1 1 5/16 | 1 3/16 | 9/16 | 7/16 | 21/64 (0.3281) | 3 3/64 (0.5156) | .4510 | .4515 | 1/2–20 | .4675 | .4701 | 3/32 | 1/8 |
| | 3.010 | | | | | | | | | | | | | | | | | | | | | |
| 3 1/8 to 3 1/2 | 3.010 | 5 1/2 | 1 5/16 | 1 7/16 | 3 7/8 | 2 7/16 | 3/32 | 2 7/32 | 7/16 | 2 3/16 | 1 3/16 | 9/16 | 7/16 | 21/64 (0.3281) | 3 3/64 (0.5156) | .4510 | .4515 | 1/2–20 | .4675 | .4701 | 3/32 | 1/8 |
| | 3.510 | | | | | | | | | | | | | | | | | | | | | |
| 3 5/8 to 4 | 3.510 | 6 3/8 | 1 5/16 | 1 1/2 | 4 5/8 | 2 1 5/16 | 3/32 | 2 5/8 | 1/2 | 2 9/16 | 1 | 3/4 | 5/8 | 13/32 (0.4062) | 4 1/64 (0.6406) | .5710 | .5715 | 5/8–18 | .5889 | .5919 | 3/32 | 1/8 |
| | 4.010 | | | | | | | | | | | | | | | | | | | | | |
| 4 1/8 to 4 3/4 | 4.010 | 7 1/4 | 1 | 1 1/2 | 5 3/8 | 3 3/8 | 3/32 | 3 1/32 | 1/2 | 3 | 1 | 3/4 | 5/8 | 13/32 (0.4062) | 4 1/64 (0.6406) | .5710 | .5715 | 5/8–18 | .5889 | .5919 | 3/32 | 1/8 |
| | 4.760 | | | | | | | | | | | | | | | | | | | | | |

[1] Approximate.

NOTE.—Thin gage blanks are to be used for all "not go" thread ring gages. For "go" thread ring gages, for all American National threads, use thin or thick blanks as follows:

| Diameter | Thin blank | Thick blank |
|---|---|---|
| From no. 0 to 1/2 inch, inclusive. | All pitches | |
| Above 1/2 to 1 1/8 inches, inclusive. | Pitches 12 threads per inch and finer except 9/16–12. | Pitches coarser than 12 threads. |
| Above 1 1/8 inches | Pitches 10 threads per inch and finer. | Pitches coarser than 10 threads per inch. |

TABLE 17.—*Thread ring gages, range 4¾ to 12¼ inches, inclusive*



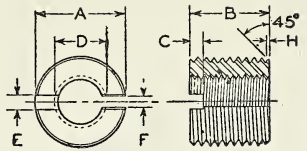

| Nominal range, inclusive | Decimal range | | *A* | *D* | *E* | *F* | *G* | *H* | *J* | *K* | *N* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Above— | To and including— | | | | | | | | | |
| | | | *Inches* | *Inch, size* | *Inches* | *No.* | | *Inches* | *Inch* | *Inches* | |
| 4¾ to 5½ | 4.760 | 5.510 | 8¼ | +1⅛ | 4 | | | 3 7/16 | ½ | 3½ | 2 |
| 5½ to 6¼ | 5.510 | 6.260 | 9¼ | 1⅛ | 4¾ | 6 | 2 | 3 15/16 | ½ | 3 15/16 | 2 |
| 6¼ to 7 | 6.260 | 7.010 | 10¼ | 1⅛ | 5½ | 6 | 2 | 4 7/16 | ½ | 4⅜ | 3 |
| 7 to 7¾ | 7.010 | 7.760 | 11¼ | 1⅛ | 6¼ | 6 | 2 | 4 13/16 | ⅝ | 5 | 3 |
| 7¾ to 8½ | 7.760 | 8.510 | 12¼ | 1⅛ | 7 | 6 | 2 | 5 5/16 | ⅝ | 5⅛ | 3 |
| 8½ to 9¼ | 8.510 | 9.260 | 13¼ | 1⅛ | 7¾ | 7 | 4 | 5 13/16 | ⅝ | 5⅝ | 5 |
| 9¼ to 10 | 9.260 | 10.010 | 14¼ | 1⅛ | 8½ | 7 | 4 | 6 7/32 | 11/16 | 6⅛ | 5 |
| 10 to 10¾ | 10.010 | 10.760 | 15¼ | 1⅛ | 9¼ | 7 | 4 | 6 23/32 | 11/16 | 6⅝ | 5 |
| 10¾ to 11½ | 10.760 | 11.510 | 16¼ | 1⅛ | 10 | 7 | 4 | 7¼ | ¾ | 7¼ | 5 |
| 11½ to 12¼ | 11.510 | 12.260 | 17¼ | 1⅛ | 10¾ | 7 | 4 | 7⅝ | ¾ | 7⅝ | 5 |

NOTE.—See note, table 16 (p. 29).

HANDLE DIMENSIONS

| Handle no. | *A* | *B* |
|---|---|---|
| 6 | 3⅜ | 1¼ |
| 7 | 3¾ | 1⅜ |

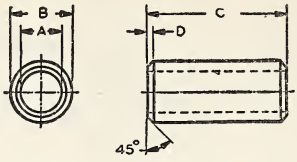
TABLE 18.—*Thread ring gage adjusting screws*




| *A* | | | Minor diameter | | *B* [1] | *C* | *D* | | | | *E* | *F* | *H* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Pitch diameter | | Minimum | Maximum | | | Size | Pitch diameter | | Tap drill | | | |
| | Minimum | Maximum | | | | | | Minimum | Maximum | | | | |
| | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | | *Inch* | *Inch* | *No.* | *Inch* | *Inch* | *Inch* |
| No. 8–36 | 0.1442 | 0.1460 | 0.1315 | 0.1333 | 3/16 | 3/64 | No. 2–64 | 0.0759 | 0.0773 | 50 (0.070) | 1/32 | 1/64 | 0.020 |
| No. 12–28 | .1906 | .1928 | .1744 | .1766 | 1/4 | 3/64 | No. 4–48 | .0985 | .1001 | 42 ( .093) | 1/32 | 1/64 | .020 |
| 1/4–28 | .2246 | .2268 | .2084 | .2106 | 5/16 | 1/16 | No. 6–40 | .1218 | .1235 | 32 ( .116) | 3/64 | 1/32 | .020 |
| 5/16–24 | .2830 | .2854 | .2641 | .2665 | 5/16 | 1/16 | No. 10–32 | .1697 | .1716 | 20 ( .161) | 3/64 | 1/32 | 1/32 |
| 3/8–24 | .3455 | .3479 | .3266 | .3290 | 3/8 | 5/64 | No. 12–28 | .1928 | .1950 | 14 ( .182) | 1/16 | 3/64 | 1/32 |
| 7/16–20 | .4024 | .4050 | .3797 | .3823 | 7/16 | 5/64 | 1/4–28 | .2268 | .2290 | 3 ( .213) | 1/16 | 3/64 | 1/32 |
| 1/2–20 | .4649 | .4675 | .4422 | .4448 | 1/2 | 3/32 | 5/16–24 | .2854 | .2878 | I ( .272) | 5/64 | 1/16 | 3/64 |
| 5/8–18 | .5859 | .5889 | .5607 | .5637 | 9/16 | 3/32 | 3/8–24 | .3479 | .3503 | Q ( .332) | 5/64 | 1/16 | 3/64 |

[1] Tolerance on length $B = \pm 1/64$ inch.

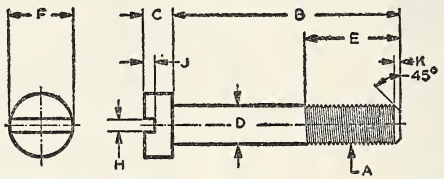
TABLE 19.—*Thread ring gage sleeves*




| *A* | *B* | | *C*[1] | *D* |
|---|---|---|---|---|
| | Minimum | Maximum | | |
| | *Inch* | *Inch* | *Inches* | *Inch* |
| No. 43 (0.089) | 0. 1368 | 0. 1370 | 1/4 | 0. 010 |
| No. 32 (.116) | . 1808 | . 1810 | 7/16 | . 020 |
| No. 27 (.144) | . 2148 | . 2150 | 5/8 | . 020 |
| No. 10 (.193) | . 2718 | . 2720 | 13/16 | 1/32 |
| No. 2 (.221) | . 3337 | . 3340 | 3/4 | 1/32 |
| F (.257) | . 3887 | . 3890 | 13/16 | 1/32 |
| P (.323) | . 4507 | . 4510 | 1 1/16 | 3/64 |
| 25/64) (.391) | . 5707 | . 5710 | 1 1/2 | 3/64 |

[1] Tolerance on length $C = \pm 1/64$ inch.

TABLE 20.—*Thread ring gage locking screws*




| *A* | | | *B*[1] | *C* | *D* | | *E* | *F* | *H* | *J* | *K* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Pitch diameter | | | | Min. | Max. | | | | | |
| | Min. | Max. | | | | | | | | | |
| | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| No. 2–64 | 0. 0745 | 0. 0759 | 29/64 | 5/64 | 0. 0840 | 0. 0860 | 3/16 | 5/32 | 1/32 | 3/64 | 0. 010 |
| No. 4–48 | . 0969 | . 0985 | 23/32 | 3/32 | . 1100 | . 1120 | 5/16 | 3/16 | 1/32 | 3/64 | . 020 |
| No. 6–40 | . 1201 | . 1218 | 1 | 1/8 | . 1360 | . 1380 | 7/16 | 7/32 | 3/64 | 1/16 | . 020 |
| No. 10–32 | . 1678 | . 1697 | 1 1/16 | 1/8 | . 1880 | . 1900 | 7/16 | 9/32 | 3/64 | 1/16 | 1/32 |
| No. 12–28 | . 1906 | . 1928 | 1 3/16 | 5/32 | . 2140 | . 2160 | 1/2 | 11/32 | 1/16 | 1/16 | 1/32 |
| 1/4–28 | . 2246 | . 2268 | 1 23/64 | 3/16 | . 2480 | . 2500 | 9/16 | 13/32 | 1/16 | 5/64 | 1/32 |
| 5/16–24 | . 2830 | . 2854 | 1 23/32 | 1/4 | . 3105 | . 3125 | 5/8 | 15/32 | 5/64 | 3/32 | 3/64 |
| 3/8–24 | . 3455 | . 3479 | 2 3/16 | 5/16 | . 3730 | . 3750 | 3/4 | 19/32 | 5/64 | 3/32 | 3/64 |

[1] Tolerance on length $B = -1/32$ inch.

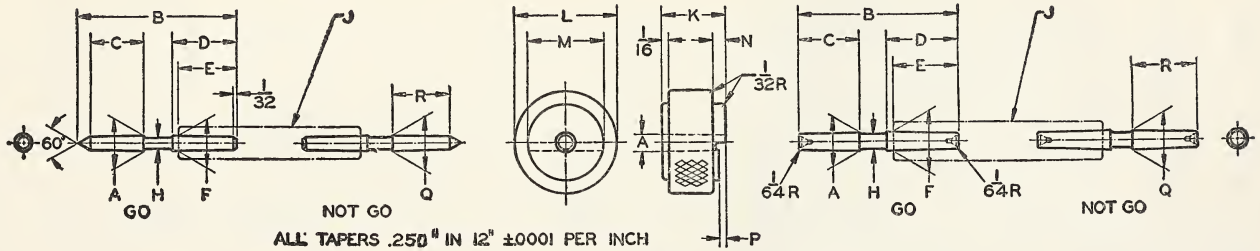
## TAPER PLUG AND RING GAGES FOR CHECKING TAPER LOCK HANDLES AND GAGING MEMBERS

It has been deemed advisable to formulate specifications for a complete set of finished gages for inspecting the taper shanks and handles of gages of taper lock design.

A complete set consists of a taper plug and a taper ring for each size range. General details of construction will be apparent from drawings and tables 21 and 22, pages 34 and 35.

In the range above 0.059 to and including 0.240 inch, the taper limits established by the American Gage Design Committee for taper lock handles and shanks may be readily maintained by the use of gages shown in table 21, in which the taper plug gage is a double-end limit gage. Similarly, in the range above 0.240 to and including 1.510 inches, the taper limits established by the American Gage Design Committee for taper lock handles and shanks may be readily maintained by the use of the gages shown in table 22, in which the taper plug gage is of the single-end limit type, with a ground step representing the minimum size of hole. For either range equally satisfactory results may be secured by using a single-end taper plug gage, on which a scribed line represents the minimum size of hole and the shoulder of the gage represents the maximum size of hole. Both designs are sanctioned by the American Gage Design Committee.

**TABLE 21.**—*Plug and ring gages for checking handles and gaging members of taper lock plug gages, range above 0.059 to and including 0.240 inch*



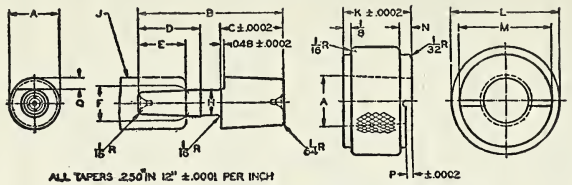

PLUG GAGES FOR CHECKING HANDLES

| Handle size no. | Go | | Not go | | Go and not go | | | | | | Handle no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *A* | *C* ±0.0002 | *Q* | *R* ±0.0002 | *B* | *D* | *E* | *F* Min. | *F* Max. | *H* | *J* |
| | *Inch* | *Inch* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | |
| 000 | 0.125 | 0.4520 | 0.126 | 0.5000 | 1 3/8 | 9/16 | 1/2 | 0.125 | 0.126 | 3/32 | 000 |
| 00 | .155 | .5145 | .156 | .5625 | 1 17/32 | 5/8 | 9/16 | .155 | .156 | 1/8 | 00 |
| 0 | .180 | .5770 | .181 | .6250 | 1 17/32 | 11/16 | 5/8 | .180 | .181 | 9/64 | 0 |

RING GAGES FOR CHECKING GAGING MEMBERS

| Size | *A* | *K* ±0.0002 | *L* | *M* | *N* | *P* ±0.0002 |
|---|---|---|---|---|---|---|
| | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* |
| 000 | 0.126 | 0.5480 | 1 | 3/4 | 1/8 | 0.0480 |
| 00 | .156 | .6105 | 1 | 3/4 | 1/8 | .0480 |
| 0 | .181 | .6730 | 1 1/8 | 7/8 | 1/8 | .0480 |

TABLE 22.—*Plug and ring gages for checking handles and gaging members of taper lock plug gages, range above 0.240 to and including 1.510 inches*




PLUG GAGES FOR CHECKING HANDLES

| Handle size no. | A | B | C | D | E | F | | H | Handle no. | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Min. | Max. | | J | |
| | Inch | Inches | Inch | Inch | Inch | Inch | Inch | Inch | | Inch |
| 1 | 0. 240 | 2 | 0. 7500 | 1 | 3/4 | 0. 239 | 0. 240 | 3/16 | 1 | 0. 025 |
| 2 | . 310 | 2 | . 7500 | 1 | 3/4 | . 239 | . 240 | 1/4 | 2 | . 025 |
| 3 | . 410 | 2 | . 7500 | 1 | 3/4 | . 309 | . 310 | 5/16 | 3 | . 050 |
| 4 | . 610 | 2 3/16 | . 8750 | 1 | 3/4 | . 408 | . 410 | 13/32 | 4 | . 100 |
| 5 | . 810 | 2 5/16 | 1. 0000 | 1 | 3/4 | . 408 | . 410 | 13/32 | 5 | . 200 |

RING GAGES FOR CHECKING GAGING MEMBERS

| Size | A | K | L | M | N | P |
|---|---|---|---|---|---|---|
| | Inch | Inches | Inches | Inches | Inch | Inch |
| 1 | 0. 240 | 0. 7980 | 1 1/8 | 7/8 | 5/32 | 0. 0480 |
| 2 | . 310 | . 7980 | 1 1/4 | 1 | 5/32 | . 0480 |
| 3 | . 410 | . 8460 | 1 3/8 | 1 1/8 | 3/16 | . 0960 |
| 4 | . 610 | . 9710 | 1 9/16 | 1 5/16 | 3/16 | . 0960 |
| 5 | . 810 | 1. 0960 | 1 3/4 | 1 1/2 | 3/16 | . 0960 |

## PLAIN ADJUSTABLE SNAP GAGES

During recent years a large number of adjustable snap gage designs have been developed by various firms, both in this country and abroad, and although in general construction and appearance the gages are very similar, they differ so much in detail that there has been no possibility of obtaining interchangeability of parts among them.

In response to insistent demand, the committee has undertaken the development of an adjustable snap gage which would embody the most desirable features of the gages now manufactured and thus enable the gage maker to produce gages which would conform to a common standard.

Four styles of adjustable snap gages have been provided as illustrated in figure 7, namely:

Model A: Employing 4 gaging pins.

Model B: Employing 4 gaging buttons.

Model C: Employing 2 gaging buttons and single block anvil.

Model MC: A miniature snap gage with 2 gaging buttons and single block anvil.

The frames of models A, B, and C have been so designed that common patterns can be used for all three. Frames are of the conventional C or semicircular type, of cast iron with solid web. Particular attention was given to weight, which approximates the average of existing proprietary designs.

Both the flanged gaging buttons and the straight gaging pins are of circular cross section, an arcuate bevel being provided at the front edge where they first engage the work. The gap between "go" and "not go" has been kept to a minimum.

A locking device was adopted which has stood the test of time—the 3-piece type with two flats on the shank of the gaging button or pin, and a locking nut and locking bushing, each provided with a bevel flat.

In the development of these gages, exceptional care was taken at every turn to insure that they should embody all of the best features of snap gage design, and the design adopted incorporates:

1. A design of frame which has proved to be exceptionally rigid under severe tests.
2. Reduction of weight to as low a point as strength of materials permits.
3. Distribution of metal to assure a nice balance and feel.
4. An effective and proved locking device.
5. Suitable construction of gaging pins, buttons, and anvils to give ample rigidity and maintain accuracy.
6. Ease and simplicity of adjustment.
7. Provision for sealing.
8. Careful selection of limits and tolerances to preserve accuracy and permit interchangeability.

General details of construction are shown in figure 7 and dimensions are given in tables 23 to 33, inclusive, and figure 8.

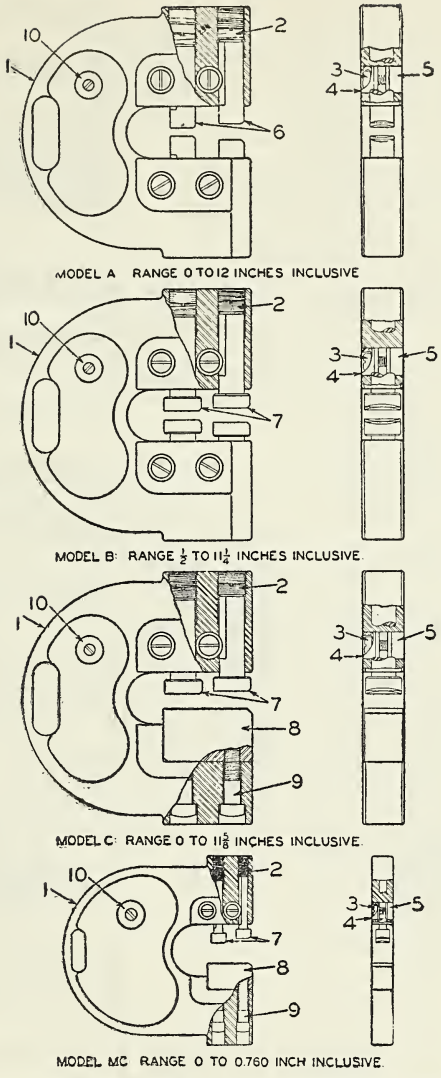
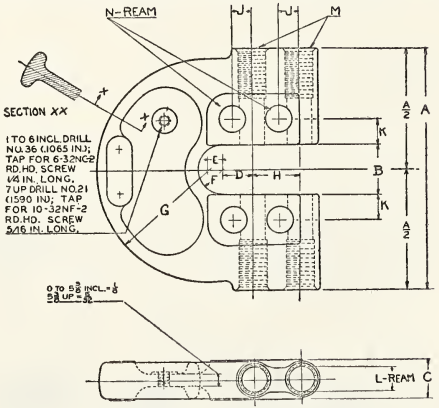



FIGURE 7.—*American Gage Design Standard adjustable snap gages, details of construction*

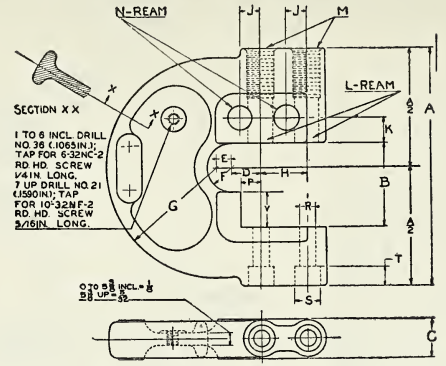
1. Frame
2. Adjusting screw
3. Locking screw
4. Locking bushing
5. Locking nut
6. Gaging pin
7. Gaging button
8. Anvil
9. Anvil screw
10. Marking disk

TABLE 23.—*Plain adjustable snap gages, models A and B, details of frame*



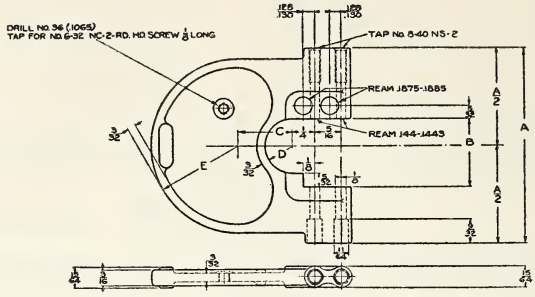

| Range, style A | | Range, style B | | Frame no. | A | B | C | D | E | F | G | H | J | | K | L | | M | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Above— | To and including— | Above— | To and including— | | | | | | | | | | Maximum | Minimum | | Maximum | Minimum | | Maximum | Maximum |
| *Inches* | *Inches* | *Inches* | *Inches* | | *Inches* | *Inches* | *Inch* | *Inch* | *Inches* | *Inches* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | | *Inch* | *Inch* |
| 0 | ½ | ---------- | ---------- | 1 | 3 | 5/8 | 31/64 | 3/8 | 3/16 | 5/16 | 1 3/8 | 1 9/32 | 0.258 | 0.256 | 5/16 | 0.3128 | 0.3125 | 0.3325-40NS-2 | 0.3135 | 0.3125 |
| ½ | 1 | ---------- | ---------- | 2 | 3 1/2 | 1 1/8 | 31/64 | 3/8 | 5/16 | 9/16 | 1 5/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325-40NS-2 | .3135 | .3125 |
| 1 | 1½ | ½ | 1 | 3 | 4 | 1 5/8 | 31/64 | 3/8 | 7/16 | 1 3/16 | 1 7/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325-40NS-2 | .3135 | .3125 |
| 1½ | 2 | 1 | 1½ | 4 | 4½ | 2 1/8 | 31/64 | 3/8 | 9/16 | 1 1/16 | 2 1/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325-40NS-2 | .3135 | .3125 |
| 2 | 2½ | 1½ | 2 | 5 | 5 | 2 5/8 | 31/64 | 3/8 | 1 1/16 | 1 5/16 | 2 3/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325-40NS-2 | .3135 | .3125 |
| 2½ | 3 | 2 | 2½ | 6 | 5 1/2 | 3 1/8 | 31/64 | 3/8 | 1 3/16 | 1 9/16 | 2 5/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325-40NS-2 | .3135 | .3125 |
| 3 | 3¾ | 2½ | 3⅛ | 7 | 6 7/8 | 3 15/16 | 39/64 | 7/16 | 7/8 | 1 31/32 | 3 5/16 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .3750 | .395-40NS-2 | .376 | .375 |
| 3¾ | 4½ | 3⅛ | 3⅞ | 8 | 7 5/8 | 4 11/16 | 39/64 | 7/16 | 1 | 2 1/32 | 3 11/16 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .3750 | .395-40NS-2 | .376 | .375 |
| 4½ | 5¼ | 3⅞ | 4⅝ | 9 | 8 3/8 | 5 7/16 | 39/64 | 7/16 | 1 1/8 | 2 23/32 | 4 1/16 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .3750 | .395-40NS-2 | .376 | .375 |
| 5¼ | 6 | 4⅝ | 5⅜ | 10 | 9 1/8 | 6 3/16 | 39/64 | 7/16 | 1 1/4 | 3 3/32 | 4 7/16 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .3750 | .395-40NS-2 | .376 | .375 |
| 6 | 7 | 5⅜ | 6¼ | 11 | 10 3/4 | 7 1/4 | 47/64 | ½ | 1 3/8 | 3 5/8 | 5 1/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575-40NS-2 | .4385 | .4375 |
| 7 | 8 | 6¼ | 7¼ | 12 | 11 3/4 | 8 1/4 | 47/64 | ½ | 1½ | 4 1/8 | 5 3/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575-40NS-2 | .4385 | .4375 |
| 8 | 9 | 7¼ | 8¼ | 13 | 12 3/4 | 9 1/4 | 47/64 | ½ | 1 5/8 | 4 5/8 | 6 1/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575-40NS-2 | .4385 | .4375 |
| 9 | 10 | 8¼ | 9¼ | 14 | 13 3/4 | 10 1/4 | 47/64 | ½ | 1 3/4 | 5 1/8 | 6 3/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575-40NS-2 | .4385 | .4375 |
| 10 | 11 | 9¼ | 10¼ | 15 | 14 3/4 | 11 1/4 | 47/64 | ½ | 1 7/8 | 5 5/8 | 7 1/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575-40NS-2 | .4385 | .4375 |
| 11 | 12 | 10¼ | 11¼ | 16 | 15 3/4 | 12 1/4 | 47/64 | ½ | 2 | 6 1/8 | 7 3/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575-40NS-2 | .4385 | .4375 |

TABLE 24.—*Plain adjustable snap gages, model C, details of frame*



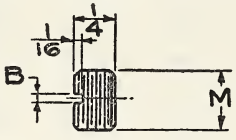

| Range, style C | | Frame no. | A | B | C | D | E | F | G | H | J | | K | L | | M | N | | R | | S | T | P | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Above— | To and including— | | | | | | | | | | Maximum | Minimum | | Maximum | Minimum | | Maximum | Minimum | Maximum | Minimum | | | | |
| *Inches* | *Inches* | | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In.* | *In* |
| 0 | ¼ | 1 | 3 | 1 1/16 | 31/64 | 3/8 | 3/16 | 5/16 | 1 3/8 | 1 9/32 | 0.258 | 0.256 | 5/16 | 0.3128 | 0.3125 | 0.3325–40NS-2 | 0.3135 | 0.3125 | 0.1927 | 0.1900 | 5/16 | 17/64 | 1/4 | 7/16 |
| ¼ | ¾ | 2 | 3 1/2 | 1 9/16 | 31/64 | 3/8 | 5/16 | 9/16 | 1 5/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325–40NS-2 | .3135 | .3125 | .1927 | .1900 | 5/16 | 17/64 | 1/4 | 7/16 |
| ¾ | 1¼ | 3 | 4 | 2 1/16 | 31/64 | 3/8 | 7/16 | 13/16 | 1 7/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325–40NS-2 | .3135 | .3125 | .1927 | .1900 | 5/16 | 17/64 | 1/4 | 7/16 |
| 1¼ | 1¾ | 4 | 4 1/2 | 2 9/16 | 31/64 | 3/8 | 9/16 | 1 1/16 | 2 1/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325–40NS-2 | .3135 | .3125 | .1927 | .1900 | 5/16 | 17/64 | 1/4 | 7/16 |
| 1¾ | 2¼ | 5 | 5 | 3 1/16 | 31/64 | 3/8 | 1 1/16 | 1 5/16 | 2 3/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325–40NS-2 | .3135 | .3125 | .1927 | .1900 | 5/16 | 17/64 | 1/4 | 7/16 |
| 2¼ | 2¾ | 6 | 5 1/2 | 3 9/16 | 31/64 | 3/8 | 1 3/16 | 1 9/16 | 2 5/8 | 1 9/32 | .258 | .256 | 5/16 | .3128 | .3125 | .3325–40NS-2 | .3135 | .3125 | .1927 | .1900 | 5/16 | 17/64 | 1/4 | 7/16 |
| 2¾ | 3 7/16 | 7 | 6 7/8 | 4 13/32 | 39/64 | 7/16 | 7/8 | 1 31/32 | 3 5/16 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .375 | .395–40NS-2 | .3760 | .3750 | .2531 | .2500 | 3/8 | 11/32 | 5/16 | 15/32 |
| 3 7/16 | 4 3/16 | 8 | 7 5/8 | 5 5/32 | 39/64 | 7/16 | 1 | 2 1/32 | 3 23/32 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .375 | .395–40NS-2 | .3760 | .3750 | .2531 | .2500 | 3/8 | 11/32 | 5/16 | 15/32 |
| 4 3/16 | 4 15/16 | 9 | 8 3/8 | 5 29/32 | 39/64 | 7/16 | 1 1/8 | 2 23/32 | 4 3/32 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .375 | .395–40NS-2 | .3760 | .3750 | .2531 | .2500 | 3/8 | 11/32 | 5/16 | 15/32 |
| 4 15/16 | 5 11/16 | 10 | 9 1/8 | 6 21/32 | 39/64 | 7/16 | 1 1/4 | 3 3/32 | 4 7/16 | 2 3/32 | .311 | .309 | 3/8 | .3753 | .375 | .395–40NS-2 | .3760 | .3750 | .2531 | .2500 | 3/8 | 11/32 | 5/16 | 15/32 |
| 5 11/16 | 6 5/8 | 11 | 10 3/4 | 7 3/4 | 47/64 | 1/2 | 1 3/8 | 3 5/8 | 5 1/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575–40NS-2 | .4385 | .4375 | .3158 | .3125 | 7/16 | 7/16 | 3/8 | 1/2 |
| 6 5/8 | 7 5/8 | 12 | 11 3/4 | 8 3/4 | 47/64 | 1/2 | 1 1/2 | 4 1/8 | 5 3/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575–40NS-2 | .4385 | .4375 | .3158 | .3125 | 7/16 | 7/16 | 3/8 | 1/2 |
| 7 5/8 | 8 5/8 | 13 | 12 3/4 | 9 3/4 | 47/64 | 1/2 | 1 5/8 | 4 5/8 | 6 1/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575–40NS-2 | .4385 | .4375 | .3158 | .3125 | 7/16 | 7/16 | 3/8 | 1/2 |
| 8 5/8 | 9 5/8 | 14 | 13 3/4 | 10 3/4 | 47/64 | 1/2 | 1 3/4 | 5 1/8 | 6 3/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575–40NS-2 | .4385 | .4375 | .3158 | .3125 | 7/16 | 7/16 | 3/8 | 1/2 |
| 9 5/8 | 10 5/8 | 15 | 14 3/4 | 11 3/4 | 47/64 | 1/2 | 1 7/8 | 5 5/8 | 7 1/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575–40NS-2 | .4385 | .4375 | .3158 | .3125 | 7/16 | 7/16 | 3/8 | 1/2 |
| 10 5/8 | 11 5/8 | 16 | 15 3/4 | 12 3/4 | 47/64 | 1/2 | 2 | 6 1/8 | 7 3/4 | 2 7/32 | .365 | .363 | 7/16 | .4378 | .4375 | .4575–40NS-2 | .4385 | .4375 | .3158 | .3125 | 7/16 | 7/16 | 3/8 | 1/2 |

TABLE 25.—*Plain adjustable snap gages, model MC, details of frame*



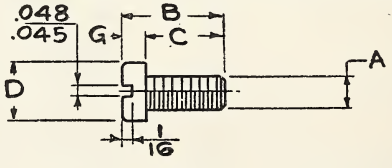

| Range | | Frame no. | *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|---|---|---|
| Above— | To and including— | | | | | | |
| *Inch* | *Inch* | | *Inches* | *Inches* | *Inch* | *Inch* | *Inches* |
| 0 | 0. 385 | 00 | 2 1/4 | 2 5/32 | 5/8 | 5/16 | 1 |
| 0. 386 | 0. 760 | 0 | 2 5/8 | 1 5/32 | 3/4 | 1/2 | 1 3/16 |

TABLE 26.—*Models A, B, and C snap gage adjusting screws*



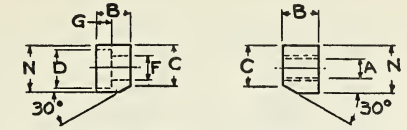

| Frame nos., inclusive | *B* | | *M* |
|---|---|---|---|
| | Max. | Min. | |
| | *Inch* | *Inch* | |
| 1 to 6 | 0. 048 | 0. 045 | 0. 3325–40NS-3 |
| 7 to 10 | . 048 | . 045 | . 395–40NS-3 |
| 11 to 16 | . 048 | . 045 | . 4575–40NS-3 |

TABLE 27.—*Models A, B, and C snap gage locking screws*




| Frame nos., inclusive | *A* | *B* | *C* | *D* | | *G* |
|---|---|---|---|---|---|---|
| | | | | Max. | Min. | |
| | | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| 1 to 6 | 8–36NF-2 | 7/16 | 11/32 | 0. 252 | 0. 248 | 3/32 |
| 7 to 10 | 10–32NF-2 | 17/32 | 27/64 | . 315 | . 310 | 7/64 |
| 11 to 16 | 12–28NF-2 | 21/32 | 17/32 | . 346 | . 341 | 1/8 |

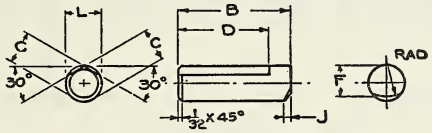
TABLE 28.—*Models A, B, and C snap gage locking bushings*




LOCKING BUSHING LOCKING NUT

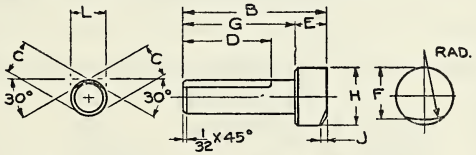
| Frame nos., inclusive | A | B | C | | D | | F | G | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Max. | Min. | Max. | Min. | | | Max. | Min. |
| | | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* | *Inch* |
| 1 to 6 | 8–36NF-2 | 11/64 | 0. 276 | 0. 271 | 0. 260 | 0. 255 | 11/64 | 3/32 | 0. 3125 | 0. 3105 |
| 7 to 10 | 10–32NF-2 | 15/64 | . 333 | . 328 | . 323 | . 318 | 13/64 | 7/64 | . 3750 | . 3730 |
| 11 to 16 | 12–28NF-2 | 19/64 | . 385 | . 380 | . 355 | . 350 | 15/64 | 1/8 | . 4375 | . 4355 |

TABLE 29.—*Model A snap gage gaging pins*



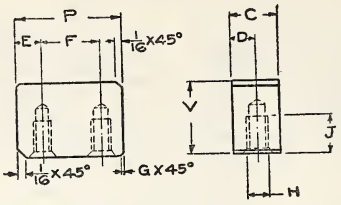

| Frame nos., inclusive | B | C | | D | F | J | L | |
|---|---|---|---|---|---|---|---|---|
| | | Max. | Min. | | | | Max. | Min. |
| | *Inches* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* | *Inch* | *Inch* |
| 1 to 6 | 15/16 | 0. 300 | 0. 298 | 13/16 | 17/64 | 3/64 | 0. 3125 | 0. 3123 |
| 7 to 10 | 1 7/32 | . 358 | . 356 | 1 1/32 | 21/64 | 3/64 | . 375 | . 3748 |
| 11 to 16 | 1 1/2 | . 417 | . 415 | 1 1/4 | 3/8 | 1/16 | . 4375 | . 4373 |

TABLE 30.—*Models B and C snap gage gaging buttons*



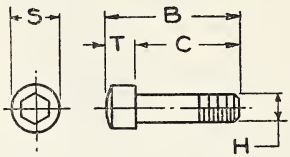

| Frame nos., inclusive | B | C | | D | E | F | G | H | | J | L | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max. | Min. | | | | | Max. | Min. | | Max. | Min. |
| | *Ins.* | *Inch* | *Inch* | *Ins.* | *In.* | *In.* | *Ins.* | *Inch* | *Inch* | *In.* | *Inch* | *Inch* |
| 1 to 6 | 1 3/16 | 0. 300 | 0. 298 | 13/16 | 1/4 | 7/16 | 15/16 | 0. 505 | 0. 500 | 3/64 | 0. 3125 | 0. 3123 |
| 7 to 10 | 1 17/32 | . 358 | . 356 | 1 1/32 | 5/16 | 9/16 | 1 7/32 | . 630 | . 625 | 3/64 | . 375 | . 3748 |
| 11 to 16 | 1 7/8 | . 417 | . 415 | 1 1/4 | 3/8 | 5/8 | 1 1/2 | . 755 | . 750 | 1/16 | . 4375 | . 4373 |

TABLE 31.—*Model C snap gage anvils*



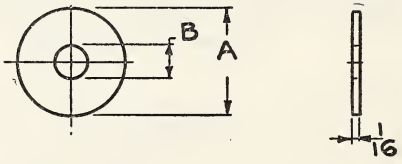

| Frame nos., inclusive | C | | D | | E | F | G | H | J | P | V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Max. | Min. | | | | | | | |
| | *Inch* | *Inch* | *Inch* | *Inch* | *In.* | *In.* | *In.* | | *In.* | *Inches* | *Ins.* |
| 1 to 6 | 0. 505 | 0. 500 | 0. 2525 | 0. 250 | 1/4 | 19/32 | 1/64 | 10-32NF-2 | 5/16 | 1 3/32 | 1/2 |
| | . 505 | . 500 | . 2525 | . 250 | 1/4 | 19/32 | 1/64 | 10-32NF-2 | 5/16 | 1 3/32 | 3/4 |
| 7 to 10 | . 630 | . 625 | . 315 | . 3125 | 5/16 | 23/32 | 1/32 | 1/4-28NF-2 | 11/32 | 1 11/32 | 9/16 |
| | . 630 | . 625 | . 315 | . 3125 | 5/16 | 23/32 | 1/32 | 1/4-28NF-2 | 11/32 | 1 11/32 | 15/16 |
| 11 to 16 | . 755 | . 750 | . 3775 | . 375 | 3/8 | 27/32 | 1/32 | 5/16-24NF-2 | 3/8 | 1 19/32 | 5/8 |
| | . 755 | . 750 | . 3775 | . 375 | 3/8 | 27/32 | 1/32 | 5/16-24NF-2 | 3/8 | 1 19/32 | 1 1/8 |

TABLE 32.—*Model C snap gage anvil screws*




| Frame nos., inclusive | B | C | H | S | T |
|---|---|---|---|---|---|
| | *Inches* | *Inches* | | *Inch* | *Inch* |
| 1 to 6 | 15/16 | 47/64 | 10-32NF-2 | 5/16 | 13/64 |
| 7 to 10 | 1 3/16 | 15/16 | 1/4-28NF-2 | 3/8 | 1/4 |
| 11 to 16 | 1 7/16 | 1 1/8 | 5/16-24NF-2 | 7/16 | 5/16 |

TABLE 33.—*Models A, B, and C snap gage marking disks*




| Frame nos., inclusive | A | B |
|---|---|---|
| | *Inch* | *Inch* |
| 1 to 6 | 5/8 | 9/64 |
| 7 to 16 | 1 | 13/64 |

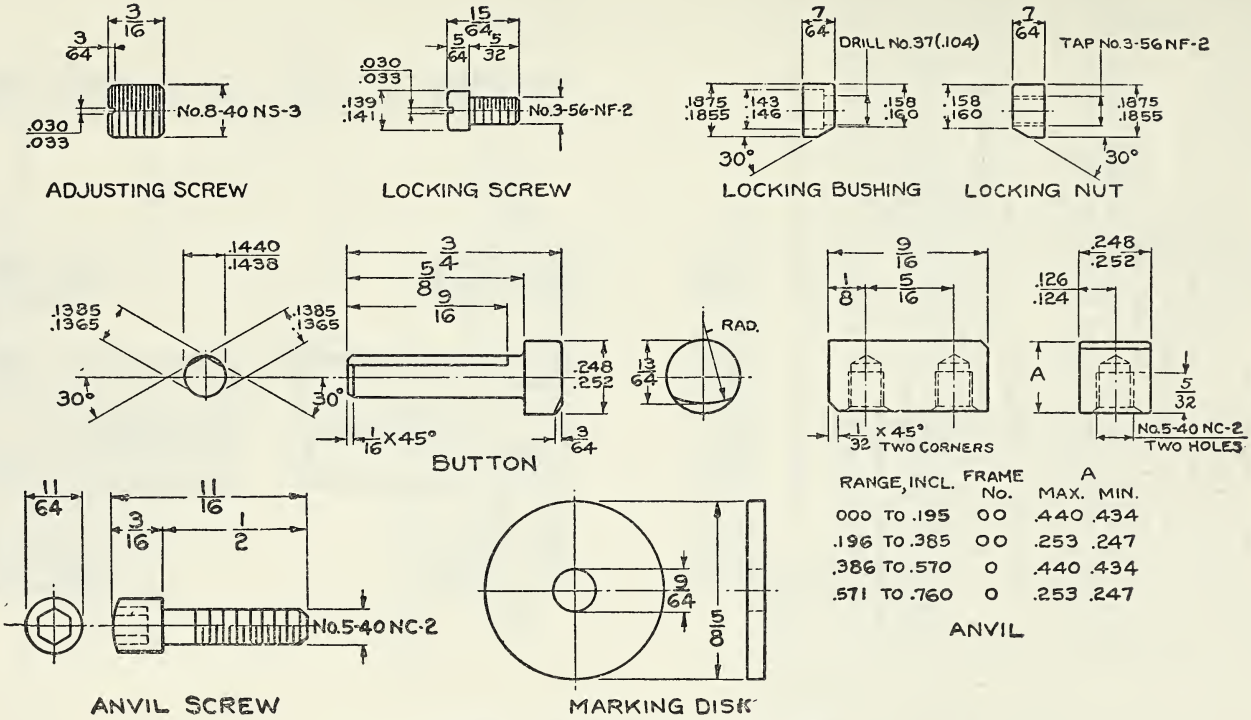



FIGURE 8.—*Model MC snap gage, details.*

## ADJUSTABLE LENGTH GAGES

As a corollary to the development of the adjustable snap gage, the committee felt that it would be a valuable contribution to gaging practice to develop an adjustable length gage in which the ease of setting and facility in handling which are characteristic of the snap gage could be applied to length measurement.

The American Gage Design Standard adjustable length gage employs for gaging members and adjusting and locking means, the same fittings which are utilized in frames nos. 7 to 10, inclusive, of the model B adjustable snap gage. For details, see tables 26, 27, and 28, pages 40, 41.

The gage heads are designed in two styles: (*a*) The progressive model with two pairs of gaging members on the same side of the spacing bar, and (*b*) the double-sided model with "go" and "not go" gaging members on opposite sides of the spacing bar, the "not go" end of the gaging head being noticeably chamfered in half-hexagonal form to distinguish it from the "go" end. Either model may be used to cover a very wide range, as the spacing bar may be constructed in any length desired.

General details of construction and dimensions are shown in figures 9, 10, 11, and 12.

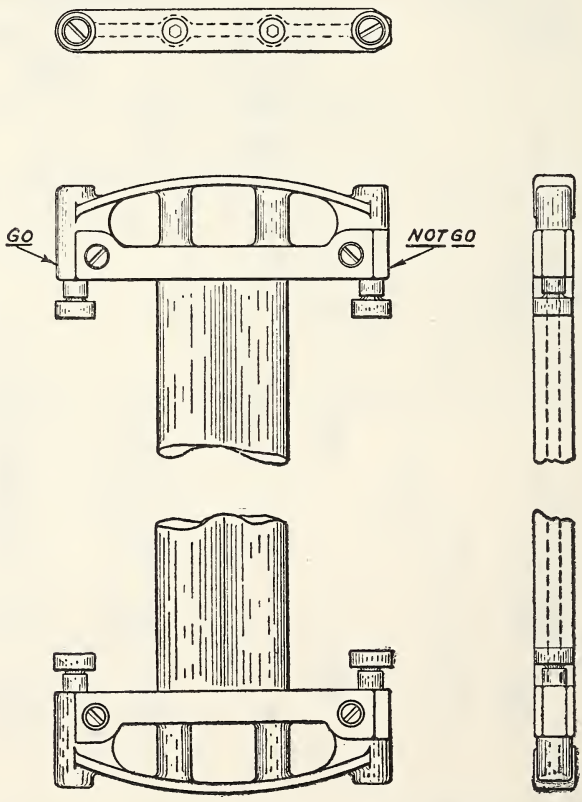



FIGURE 9.—*American Gage Design Standard adjustable length gage assembly (double-sided model shown).*

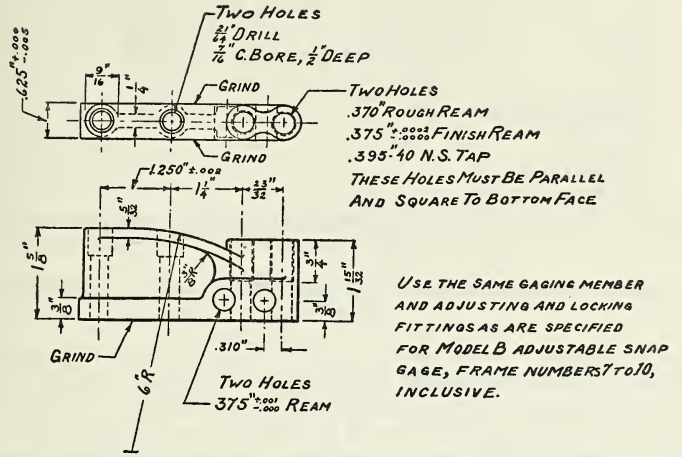



FIGURE 10.—*American Gage Design Standard adjustable length gage, detail of length gage head, progressive model.*

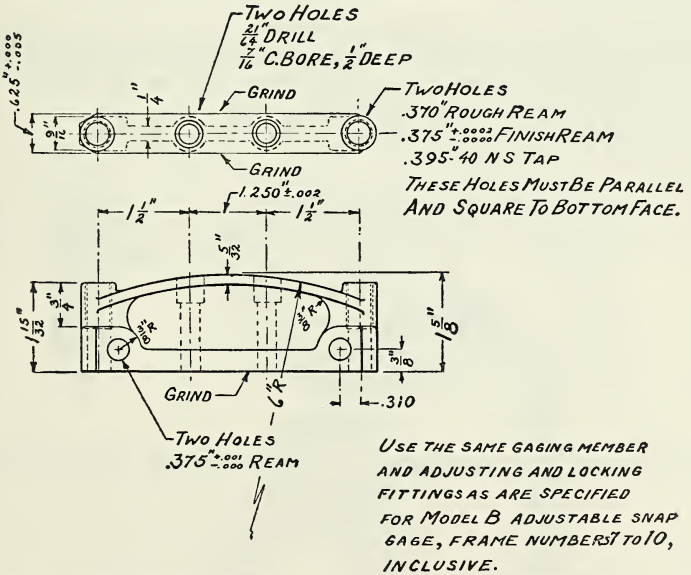



FIGURE 11.—*American Gage Design Standard adjustable length gage, detail of length gage head, double-sided model.*

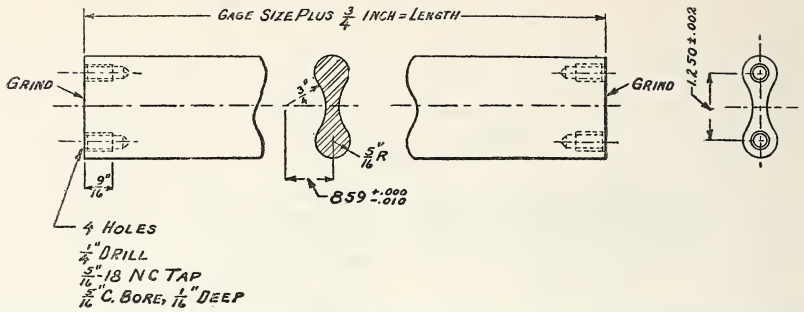



FIGURE 12.—*American Gage Design Standard adjustable length gage, detail of length gage spacing bar.*

## TWIN RING GAGE BLANKS—COMBINATION RING AND SNAP GAGE BLANKS

A type of gage which has enjoyed widespread use and acceptance, particularly in United States Government arsenals, is shown in figure 13. This gage was deemed sufficiently convenient for the rapid inspection of certain types of small precision parts to warrant its adoption by the committee as an American Gage Design Standard in the range 0.059 to 1.135 inches, inclusive.

As will be apparent from reference to figure 13, this gage consists of a flat blank or gage body of unhardened steel bored out to accommodate a "go" and a "not go" ring gage bushings of hardened tool steel. In this form, the gage body is tantamount to the conventional twin ring gage holder.

However, if desired, the blank holder can be readily milled out in manufacture at the "not go" end to transform it into an effective combination ring and solid snap gage, the jaws or anvils in this case being hardened, ground, and lapped to size.

General details of construction are shown in table 34.

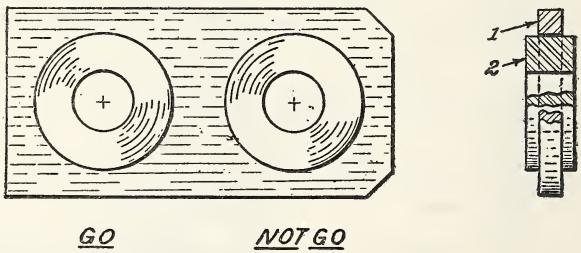
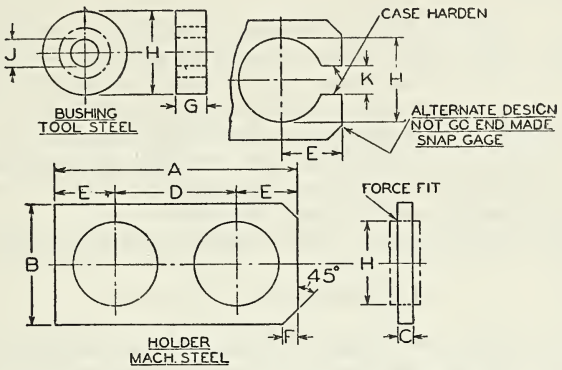



FIGURE 13.—*American Gage Design Standard twin ring gage, details of construction.*

1. Body.
2. Bushing.

TABLE 34.—*American Gage Design Standard twin ring gage blanks, combination ring and snap gage blanks, details of construction, range 0.059 to and including 1.135 inches*




| Range | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Above— | To and including— | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* | *J* Drill | *K* |
| *Inch* | *Inches* | *Inches* | *Inches* | *Inch* | *Inches* | *Inches* | *Inch* | *Inch* | *Inches* | *Inch* | *Inch* |
| 0. 059 | 0. 240 | 2 | 1 | 1/4 | 1 | 1/2 | 1/8 | 3/8 | 7/16 | ----- | 3/64 |
| . 240 | . 510 | 2 1/2 | 1 1/4 | 1/4 | 1 1/4 | 5/8 | 1/8 | 1/2 | 3/4 | ----- | 7/32 |
| . 510 | . 825 | 4 | 2 | 1/4 | 2 | 1 | 1/4 | 1/2 | 1 3/8 | 15/32 | 15/32 |
| . 825 | 1. 135 | 4 1/4 | 2 1/4 | 1/4 | 2 | 1 1/8 | 1/4 | 1/2 | 1 5/8 | 25/32 | 25/32 |

## OFFICIAL MONOGRAM FOR DESIGNATING PRODUCTS MADE TO AMERICAN GAGE DESIGN STANDARDS

The optional use of the monogram shown in figure 14, to identify gages made to American Gage Design Standards, is sanctioned by the committee. The monogram, it will be noted, consists of the initials "AD", the right hand side of the "A" and the straight side of the "D" being common. The monogram, if used, should be placed adjacent to the maker's trade mark.

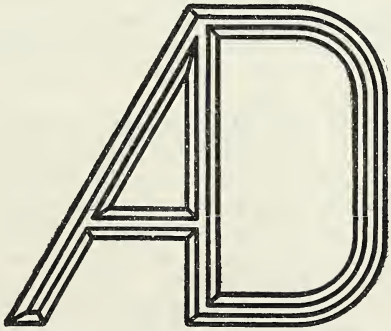


FIGURE 14.—*Official monogram for designating products made to American Gage Design Standards.*

## APPLICATION OF AMERICAN GAGE DESIGN STANDARDS TO SPECIAL TYPES OF GAGES, RECOMMENDED PRACTICE

While the American Gage Design Standards have been adopted with specific types and sizes of gages in mind, it is recommended that standard blanks, handles, etc., be used wherever practicable in the design and manufacture of special gages, the design of which did not come within the scope of the committee's work.

Where lengths and diameters are entirely special and blanks of standard dimensions cannot be utilized, it is further recommended that standard handles and fittings be used.

Observance of this practice will tend to reduce costs and facilitiate procurement.

## HISTORY OF PROJECT

The American Gage Design Committee was formed in December 1926 to consolidate for the benefit of industry at large the independent efforts which were already in progress on the part of a number of large industrial concerns, representatives of United States Government Departments, and several of the leading gage manufacturers to simplify gaging practice through the adoption of standard designs for gage blanks and component parts. The designs developed by the American Gage Design Committee are now available to everyone and will minimize the necessity for the manufacture of special gages of the simpler types. The committee was given full support and recognition by engineering societies, the American Standards Association, the Bureau of Standards, the War and Navy Departments, and the National Screw Thread Commission. It should be pointed out, however, that the major work of the committee was contributed by industry itself, many of the country's largest industrial units in widely diversified fields being represented by active membership on the committee.

By the spring of 1929, formal design standards had been completed and adopted for plain plug and ring, and thread plug and ring gages of all sizes above 0.059 to and including 4½ inches diameter. These standards were published in March 1930 as Miscellaneous Publication No. 100 of the Bureau of Standards, entitled "Plain and Thread Plug and Ring Gage Blanks, Recommended Commercial Standard", and were subsequently promulgated by the Department of Commerce as Commercial Standard CS8-30. They were later approved by the American Standards Association as American Standard B47-1932.

The widespread and almost immediate adoption of the original American Gage Design Standards by gage manufacturers and industry at large led to a very insistent demand that this work be extended to include gages of larger sizes and of other types commonly in use. Since the original report was published a considerable number of suggestions have been received from industry at large, particularly in response to the adherence survey of the American Gage Design Standards. The committee has given every suggestion the most painstaking study, and the best of them have been adopted in the present report.

No attempt has been made to set gage tolerances or fits, the work being confined solely to selection of the best possible designs for gage blanks; but the work on fits and tolerances of the National Screw Thread Commission and of the Sectional Committee on Allowances and Tolerances for Cylindrical Parts and Limit Gages is available for use in connection with gages made to American Gage Design Standards.

In promulgating these standards, the committee has not intended to render obsolete existing stocks of gages in the hands of manufacturers or users; rather, it has been its intention to provide a standard which could be gradually adopted through replacement of existing stocks. Representing the best ideas of industry at large, including gage makers and gage users, the American Gage Design Standards should have whole-hearted support and be accepted and used by gage purchasers, and should render obsolete the wasteful and costly practice of requisitioning gages to individual design standards, which has existed in many cases heretofore. Tool supervisors and standards departments of large industrial concerns are particularly urged to adopt, as soon as practicable, the American Gage Design Standards as a substitute for any individual standards which may now be employed.

The committee's efforts to make available in every instance the best possible design of gage blank was materially furthered by the generous action of the gage manufacturers represented on the committee, most of whom offered without reservation to dedicate to public use their proprietary patent rights on any gage construction the utilization of which might be desired by the committee. The committee desires to make formal recognition of the specific action of the Pratt & Whitney Co., of Hartford, Conn., and the Taft-Peirce Manufacturing Co., of Woonsocket, R.I., in contributing, respectively, their patented trilock plug gage design and patented single-unit thread ring gage locking device to public use, as a part of this standardization program.

The committee requested the application of the certification plan to this standard by the Bureau of Standards.

## STANDING COMMITTEE

The following standing committee was appointed to consider semi-annually any comments or suggestions as to changes in the standard in order that it may be kept in accord with the desires of the industry and the advance in the art:

Col. J. O. Johnson, chairman, Consulting Engineer, Washington, D.C.
F. S. Blackall, Jr., Taft-Peirce Manufacturing Co.
E. J. Bryant, Greenfield Tap & Die Corporation.
C. R. Burt, Pratt & Whitney Co.
A. C. Danekind, General Electric Co.
C. B. LePage, The American Society of Mechanical Engineers.
W. L. Barth, General Motors Corporation.

The following, among others, have participated in the work of the American Gage Design Committee:

Erik Aldeborgh, the Standard Gage Co., Poughkeepsie, N.Y.

J. Chester Bath, John Bath & Co., Worcester, Mass.

H. W. Bearce, secretary, Bureau of Standards, Washington, D.C.

F. J. Benesch, machine manufacturing planning division, Western Electric Co., Hawthorne Station, Chicago, Ill.

#*†F. S. Blackall, Jr., chairman of editorial subcommittee, president and general manager, The Taft-Peirce Manufacturing Co., Woonsocket, R.I.
*‡E. J. Bryant, Greenfield Tap & Die Corporation, Greenfield, Mass.
*C. R. Burt, president, Pratt & Whitney Co., Hartford, Conn.
Fred Colvin, editor American Machinist, Tenth Avenue and Thirty-sixth Street, New York, N.Y.
*‡A. C. Danekind, manager's office, Building 44, General Electric Co., Schenectady, N.Y.
A. H. d'Arcambal, Pratt & Whitney Co., Hartford, Conn.
C. F. Dreyer, development engineer, mechanical inspection development, Western Electric Co., Hawthorne Station, Chicago, Ill.
George M. Foster, Northern Electric Co., Montreal, Canada.
John Gaillard, mechanical engineer, A.S.A., 29 West Thirty-ninth Street, New York, N.Y.
#†‡W. H. Gourlie, gage division, Pratt & Whitney Co., Hartford, Conn.
A. Grieve, Chevrolet Motor Co., Detroit, Mich.
E. D. Hall, Western Electric Co., Hawthorne Station, Chicago, Ill.
E. A. Hanson, president, The Hanson-Whitney Machine Co., Hartford, Conn.
P. M. Herrick, Cadillac division, General Motors Corporation, Detroit, Mich.
H. D. Hiatt, Nash Motors Co., Racine, Wis.
W. L. Hindman, Dodge Bros., (Inc.), Detroit, Mich.
Commander H. B. Hird, Bureau of Engineering, Navy Department, Washington, D.C.
#*Col. J. O. Johnson, chairman, consulting engineer, Mills Building, Washington, D.C.
C. V. Johnson, sales engineer, The John-Sons Gage Works, Hartford, Conn.
‡H. S. Kartsher, 3211 Sycamore Road, Cleveland Heights, Ohio.
*C. B. LePage, assistant secretary, A.S.M.E., 29 West Thirty-ninth Street, New York, N.Y.
‡H. B. Lewis, Brown & Sharpe Manufacturing Co., Providence, R.I.
A. M. Lord, Taylor Instrument Cos., Rochester, N.Y. (deceased).
‡L. M. McPharlin, Pierce-Arrow Motor Car Co., Buffalo, N.Y.
‡P. V. Miller, manager, small tool department, The Taft-Peirce Manufacturing Co., Woonsocket, R.I.
C. H. Moen, Muncie Products Co., Muncie, Ind.
W. C. Mueller, assistant superintendent of manufacturing planning, Western Electric Co., Hawthorne Station, Chicago, Ill.
R. S. Newton, the New York Air Brake Co., Watertown, N.Y.
W. J. Outcalt, standards section, General Motors Corporation, Detroit, Mich.
‡D. W. Ovaitt, chairman of technical subcommittee (1926–30) Dodge Bros. Corporation, Division, The Chrysler Corporation, Detroit, Mich.
C. J. Oxford, chief engineer, National Twist Drill & Tool Co., Detroit, Mich.
Lieut. Col. E. C. Peck, room 305, Lake Erie Bank Building, 1612 Euclid Avenue, Cleveland, Ohio.
Louis E. Peck, general manager, the Threadwell Tool Co., Greenfield, Mass.
Charles M. Pond, manager, small tool and gage division, Pratt & Whitney Co., Hartford, Conn.
C. H. Reynolds, The Sheffield Machine & Tool Co., Dayton, Ohio.
P. D. Ritchey, The Standard Gage Co., Poughkeepsie, N.Y. (#resigned).
C. E. Rundorff, research department, Buick Motor Co., Flint, Mich.
‡A. W. Schoof, gage development and standards department, Western Electric Co., Hawthorne Station, Chicago, Ill.
A. J. Schwartz, United States Naval Gun Factory, Navy Yard, Washington, D.C.
J. A. Siegel, Packard Motor Car Co., Detroit, Mich.
O. J. Snider, Cadillac Motor Car Co., Detroit, Mich.
H. B. Stringer, Winter Bros. Co., Wrentham, Mass.
H. L. Van Keuren, The Van Keuren Co., 12 Copeland Street, Watertown, Boston, Mass.
#‡C. E. Watterson, president, The Sheffield Machine & Tool Co., Dayton, Ohio. (deceased).
‡W. H. Weingar, 88 Maplewood Avenue, West Hartford, Conn.
K. D. Williams, Bureau of Engineering, Room 2326, Navy Department, Washington, D.C.
Charles E. Winter, Winter Bros. Co., Wrentham, Mass.
George R. Worner, Taylor Instrument Cos., Rochester, N.Y.

‡Member of technical subcommittee (1926–30).
#Member of technical subcommittee (1930—).
* Member of standing committee.
† Member of editorial committee.

## EFFECTIVE DATE

The general conference set the effective date for new production as January 1, 1934, and for clearance of existing stocks not later than January 1, 1935.

## AMERICAN STANDARD

This commercial standard was approved as American Standard No. B47—1933, by the American Standards Association on October 30, 1933.

## ACCEPTORS

Individuals and organizations listed below have indicated in writing, acceptance of this specification as their standard of practice, but such endorsement does not signify that they may not find it necessary to deviate from the standard, or that they guarantee their products to conform to the requirements of this standard.

ASSOCIATIONS

American Petroleum Institute, Dallas, Tex.
American Railway Bridge & Building Association, Chicago, Ill. (in principle).
Metal Cutting Tool Institute, Hartford, Conn. (in principle).
National Association of Farm Equipment Manufacturers, Chicago, Ill.
Southern Supply & Machinery Distributors' Association, Richmond, Va.

FIRMS

T. R. Almond Manufacturing Co., Ashburnham, Mass.
American Locomotive Co., New York, N.Y.
American Machinist, New York, N.Y. (in principle).
American Tool & Manufacturing Co., Urbana, Ohio.
Axelson Manufacturing Co., Los Angeles, Calif.
John Bath & Co., Inc., Worcester, Mass.
Bausch & Lomb Optical Co., Rochester, N.Y.
Bethlehem Steel Co. (Lebanon plant), Lebanon, Pa.
B. H. Blood, consulting engineer, Hartford, Conn.
Brown-Morris Co., Detroit, Mich.
Brown & Sharpe Manufacturing Co., Providence, R.I.
The Bullard Co., Bridgeport, Conn.
Cambridge Instrument Co., Inc., Ossining, N.Y. (in principle).
Century Electric Co., St. Louis, Mo.
Chevrolet Motor Co., Flint, Mich.
The Chicago Screw Co., Chicago, Ill.
Cleveland Twist Drill Co., Cleveland, Ohio.
Coats Machine Tool Co., Inc., New York, N.Y.
The Comtor Co., Waltham, Mass.
Continental Motors Corporation, Muskegon, Mich.
Continental Motors Corporation, Detroit, Mich.
Electric Boat Co., Groton, Conn.
Excelsior Tool & Gauge Co., Detroit, Mich.
Fafnir Bearing Co., New Britain, Conn.
Federal Products Corporation, Providence, R.I.
The Ferry Cap & Set Screw Co., Cleveland, Ohio.
General Motors Corporation, Detroit, Mich.
The Geometric Tool Co., New Haven, Conn.
Gisholt Machine Co., Madison, Wis.
Greenfield Tap & Die Corporation, Greenfield, Mass.
Illinois Central Railroad Co., Chicago, Ill.
International Harvester Co., Chicago, Ill.
International Nickel Co., Inc., Huntington, W.Va. (in principle).
E. P. Johnson Rule Manufacturing Co., Chicago, Ill.
Jones & Lamson Machine Co., Springfield, Vt.
F. Jos. Lamb Co., Detroit, Mich.
Lamson & Sessions Co., Cleveland, Ohio.
Leeds & Northrup Co., Philadelphia, Pa.
Link-Belt Co., Chicago, Ill.
Manufacturers' & Inventors' Electric Co., New York, N.Y.
Midwestern Tool Co., Chicago, Ill.
Fletcher F. Milligan Co., Cleveland, Ohio.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Moto Meter Gauge & Equipment Corporation, La Crosse, Wis. (in principle).
National Twist Drill & Tool Co., Detroit, Mich.
Nestor Manufacturing Co., Inc., New York, N.Y.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

Northwest Automatic Products Corporation, Minneapolis, Minn.
Packard Motor Car Co., Detroit, Mich.
Pawtucket Manufacturing Co., Pawtucket, R.I.
Pheoll Manufacturing Co., Chicago, Ill.
Pierce Arrow Motor Car Co., Buffalo, N.Y.
Pratt & Whitney Co., Hartford, Conn.
Precision Gage & Tool Co., Dayton, Ohio.
Reed Small Tool Works, Worcester, Mass.
Reliance Die & Stamping Co., Chicago, Ill.
Remington Rand, Inc., Syracuse, N.Y.
Republic Steel Corporation, Upson Nut Div., Cleveland, Ohio.
Rhode Island Tool Co., Providence, R.I.
Rivett Lathe and Grinder Corporation, Brighton, Mass. (in principle).
R. & M. Manufacturing Co., Detroit, Mich.
Russell-Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
George Scherr Co., Inc., New York, N.Y.
F. H. Smith Manufacturing Co., Chicago, Ill.
Standard Tool Co., Cleveland, Ohio.
Superior Machine & Engineering Co., Detroit, Mich.
Taft-Peirce Manufacturing Co., Woonsocket, R.I.
Taylor Instrument Cos., Rochester, N.Y.
Threadwell Tool Co., Greenfield, Mass.
L. W. Van Denburgh, consultant on mechanical problems, Newark, N.J.
The Van Keuren Co., Watertown, Mass.
Vinco Tool Co., Detroit, Mich.
Warner & Swasey Co., Cleveland, Ohio.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Western Union Telegraph Co., New York, N.Y.
West & Dodge Thread Gauge Co., Inc., Boston, Mass.
Western Electric Co., New York, N.Y.
Westinghouse Electric & Manufacturing Co., Mansfield, Ohio.
Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
White Motor Co., Cleveland, Ohio.
Winchester Repeating Arms Co., New Haven, Conn.

GOVERNMENT

Ordnance Department, U.S. Army, Gage Division, Washington, D.C.
National Screw Thread Commission, Washington, D.C. (in principle).
Material Laboratory, Navy Yard, New York, N.Y. (in principle).
Matériel Division, U.S. Army, Air Corps, Wright Field, Dayton, Ohio.
Department of Interior, Washington, D.C.
U.S. Treasury Department, Washington, D.C.
Veterans' Administration, Washington, D.C.
War Department, Corps of Engineers, Washington, D.C.
Bureau of Standards, Gage Section, Washington, D.C. (in principle).

## COMMERCIAL STANDARDS

| CS No. | Item |
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| 0-30. | The commercial standards service and its value to business. |
| 1-32. | Clinical thermometers (second edition). |
| 2-30. | Mopsticks. |
| 3-28. | Stoddard solvent. |
| 4-29. | Staple porcelain (all-clay) plumbing fixtures. |
| 5-29. | Steel pipe nipples. |
| 6-31. | Wrought-iron pipe nipples (second edition). |
| 7-29. | Standard weight malleable iron or steel screwed unions. |
| 8-33. | Gage blanks (second edition). |
| 9-33. | Builders' template hardware (second edition). |
| 10-29. | Brass pipe nipples. |
| 11-29. | Regain of mercerized cotton yarns. |
| 12-33. | Fuel oils (second edition). |
| 13-30. | Dress patterns. |
| 14-31. | Boys' blouses, button-on waists, shirts, and junior shirts. |
| 15-29. | Men's pajamas. |
| 16-29. | Wall paper. |
| 17-32. | Diamond core drill fittings (second edition). |
| 18-29. | Hickory golf shafts. |
| 19-32. | Foundry patterns of wood (second edition). |
| 20-30. | Staple vitreous china plumbing fixtures. |
| 21-30. | Interchangeable ground glass joints. |
| 22-30. | Builders' hardware (nontemplate). |
| 23-30. | Feldspar. |
| 24-30. | Standard screw threads. |
| 25-30. | Special screw threads. |
| 26-30. | Aromatic red cedar closet lining. |
| 27-30. | Plate glass mirrors. |
| 28-32. | Cotton fabric tents, tarpaulins, and covers. |
| 29-31. | Staple seats for water-closet bowls. |
| 30-31. | Colors for sanitary ware. |
| 31-33. | Wood shingles (second edition). |
| 32-31. | Cotton cloth for rubber and pyroxylin coating. |
| 33-32. | Knit underwear (exclusive of rayon). |
| 34-31. | Bag, case, and strap leather. |
| 35-31. | Plywood. |
| 36-33. | Fourdrinier wire cloth (second edition). |
| 37-31. | Steel bone plates and screws. |
| 38-32. | Hospital rubber sheeting. |
| 39-32. | Wool and part-wool blankets. |
| 40-32. | Surgeons' rubber gloves. |
| 41-32. | Surgeons' latex gloves. |
| 42-32. | Fiber insulating board. |
| 43-32. | Grading of sulphonated oils. |
| 44-32. | Apple wraps. |
| 45-33. | Douglas fir plywood. |
| 46-33. | Hosiery lengths. |
| 47-34. | Marking of gold filled and rolled gold plate articles other than watch cases. |

NOTE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice in their industry, may secure copies of the above standards, while the supply lasts, by addressing the Division of Trade Standards, Bureau of Standards, Washington, D.C.



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