parties. Section 1930 provides: 'In such an action or special proceeding, the court must, in a proper case, substitute a successor in office, in place of a person made a party in his official capacity, who has died or ceased to hold office; but such a successor shall not be substituted as a defendant, without his consent, unless at least fourteen days' notice of the application for the substitution has been personally served upon him.'"

We infer from this and from the substitution, already referred to, made by the Supreme Court of New York in *Long Sault Development Co.* v. *Call*, 242 U. S. 272, s. c. *Matter of Long Sault Development Co.*, 212 N. Y. 1, that such substitutions are a matter of state practice and law, and, as already said, this enables us to avail ourselves in such a case as this of that practice. *City of Boston* v. *Jackson, supra.*

The motions for substitution of the State Tax Commission of New York for Wendell, Comptroller, and of Sherman, Attorney General, for Newton, Attorney General, will be granted.

VANDENBURGH *v.* TRUSCON STEEL COMPANY.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT.

No. 273. Argued January 17, 1923.—Decided February 19, 1923.

1. A patent cannot be extended by reissue to a field beyond its original intention. P. 14. *Miller* v. *Brass Co.*, 104 U. S. 350.
2. Patent No. 841,741, to Vandenburgh, for a bar, to be used in reinforcing concrete construction, provided on one side with a series of kerfs, each with an integral overlapping spur, and a spiral coil disposed in the kerfs and retained beneath the spurs, is not infringed by a collapsible construction consisting of a spiral loosely engaging two spacer bars. P. 14.
3. The method of attaching a metal spiral to a metal rod by kerfs, was anticipated in metal working and in reinforcing concrete, and

adding a spur or clamp, or hammering the kerf edges, to fix the rod, involved no invention P. 15.
277 Fed. 345, affirmed.

This was a bill in equity by Vandenburgh praying an injunction and accounting for the infringement of a patent granted him January 22, 1907, No. 841,741, and reissued to him August 15, 1916. Reissue No. 14,182. The patent is for a reinforcing bar to be used in concrete construction.

The patent since reissue has been the subject of litigation in the second, third and sixth circuits. In all the circuits, the first and second claims of the reissue have been held void because too broad and because secured nine years after the original issue for the purpose of covering intervening devices. In the second circuit, Judge Hough, sitting on the District Court, found that claim 3 must be so narrowly construed that defendant's device did not infringe. The Circuit Court of Appeals sustained the third claim and found infringement, reversing the District Court's decree, and sent the case back for assessment of profits which have been found to be about $15,000.00.

In the third circuit, Judge Orr found claim No. 3 invalid for lack of invention. The Circuit Court of Appeals sustained the decree of dismissal by the District Court, but on the ground of non-infringement.

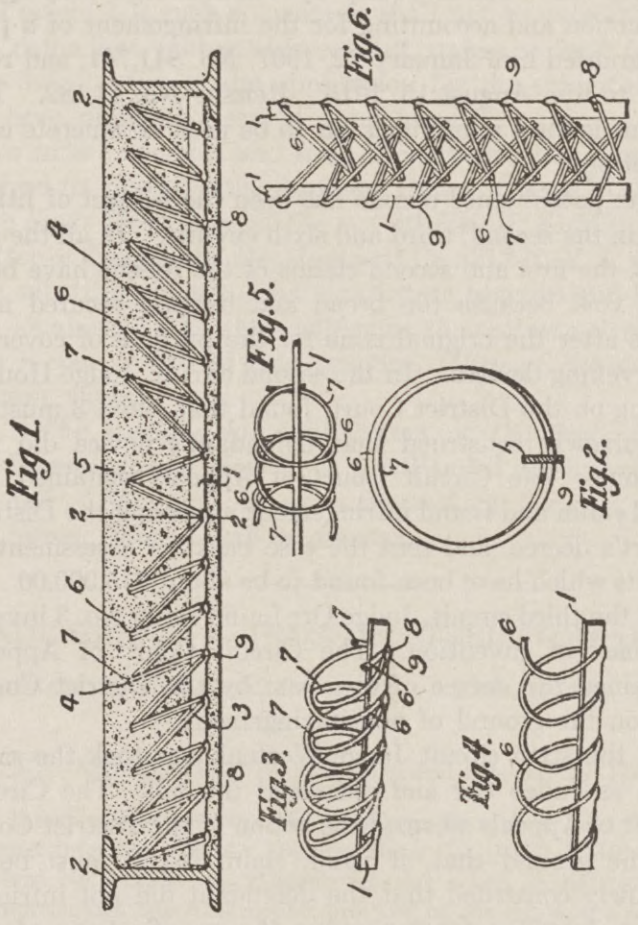
In the sixth circuit Judge Westenhaver took the same view as Judge Orr and dismissed the bill. The Circuit Court of Appeals affirmed the action of the District Court on the ground that, if valid, claim No. 3 must be so narrowly construed that the defendant did not infringe.

The drawings accompanying the specifications of the patent are the same in the reissue and appear on the page following.

The specifications say:

" The invention has for an object to provide a reinforcing-bar with one or more spirally-disposed coils secured to

the bar so as to provide an extended area of contact adapted to resist strain longitudinally and laterally of the bar and to form a truss within the body of concrete or



other plaster material which provides the maximum of supporting strength in the arch or surface to be formed.

"Other and further objects and advantages of the invention will be hereinafter set forth, and the novel features thereof defined by the appended claims.

" In the drawings, Figure 1 is a vertical section showing the bar applied to supporting girders or beams. Figure 2 is an enlarged vertical section on the line 2—2, Fig. 1. Fig. 3 is a detailed perspective of the primary and secondary coils shown in Fig. 1. Fig. 4 is a similar view of a modified form using one coil. Fig. 5 is a detailed plan of the form shown in Fig. 3, and Fig. 6 is an elevation of two meshing coils used for girder and column construction.

* * * * *

" The bar may be provided with a primary coil 6, extending in one direction, as shown in Fig. 4, which is sufficient in light construction; but when a heavier construction is to be used a secondary coil 7 is provided, which extends in the opposite direction to the coil 6 and through the same so as to cross beneath the coil 6 at a point directly above the bar, thus providing a construction in which all lateral pull or strain of the coil is avoided, owing to the equalization thereof by the oppositely-extending coils and the tendency of the coils to move or flatten toward the face of the bar resisted. This preferred construction is shown in Figs. 1 and 3, and it is also desirable that both of the coils be deflected away from the center of the bar, as shown in Fig. 1, as the greatest supporting strain carried by the arch is at the center thereof, and this deflection therefore resists such strain and tends to draw the coils upward into a position at right angles to the bar.

"As a preferred means of securing the coils to the bar I have shown a series of kerfs 8 in one face of the bar inclined away from the center of the bar toward the opposite ends thereof, and the coils are seated within these kerfs and held therein by means of the integral spurs 9, which are forced downward upon the coils when inserted and permanently retain them in position.

"In Fig. 6 a modified application of the invention is shown where two of the bars are disposed parallel to each other, with their coils intermeshing, for use in column or girder construction, wherein such a construction provides the maximum of strength with the minimum of weight in the reinforcing material.

"In the operation of the invention it will be seen that the bar supporting the coil resists any movement thereof longitudinally of the bar and provides the necessary strength upon which the truss structure formed by the coils is carried."

The first four claims of the original patent were as follows:

1. In a reinforcing bar, a spiral coil rigidly secured thereto at two points in each convolution thereof and extended beyond and free of said bar at the opposite side therefrom to the securing-point.

2. In a reinforcing-bar, a spiral coil rigidly secured thereto at two points in each convolution thereof and extended beyond and free of said bar at the opposite side therefrom to the securing-point, said coils being deflected in opposite directions from the center of the bar toward the ends thereof.

3. A reinforcing-bar provided upon one end with a series of kerfs each having an integral overlapping spur, and a coil disposed in said kerfs, each convolution thereof being retained beneath one of said spurs.

4. A reinforcing-bar provided upon one edge with a series of kerfs disposed diagonally to the length of the bar each having an overlapping integral spur projected toward the center of the bar, and a coil disposed in said kerfs and retained beneath said spurs.

The first and second claims of the reissued patent were as follows:

1. A concrete reinforcing consisting of a bar having a plurality of integral spurs, and a spiral coil permanently

secured thereto by having the spurs bent down on the several coils, the coils extending beyond and free of the bar at the opposite side therefrom to the securing point.

2. A concrete reinforcing consisting of a bar having integral means to secure a coil thereto, and a spiral coil permanently secured to the bar in each convolution and extended beyond and free of said bar at the opposite side therefrom to the securing point.

The third and fifth claims of the reissued patent were the same as the third and fourth of the original.

The defendant makes and sells a collapsible spiral, or cylindrical helix used in strengthening concrete columns or pillars. It consists of a cylindrical spiral of steel wire fitted to two T bars or spacers. Each convolution of the spiral engages the leg or outside edge of the T spacers at regular intervals. The engagement is loose fitting so that this construction which is normally stove pipe shaped can be made flat for shipment by moving the metal rods or spaces longitudinally in opposite directions. The method by which the spiral is attached to the spacer bar is a rectangular notch in the edge of the T bar, with one or both corners peened or hammered down so as to retain and loosely hold the spiral. This is said to infringe the claims of plaintiff's reissued patent Nos. 1 and 2 and also claims 3 and 5 which were in the reissue as in the original patent, except that in claim 3 the word end was changed to edge to correct an obvious error.

Mr. O. Ellery Edwards and *Mr. Carlos P. Griffin* for petitioner.

Mr. W. F. Guthrie, with whom *Mr. E. N. Pagelsen* was on the brief, for respondent.

Mr. Chief Justice Taft, after stating the case as above, delivered the opinion of the Court.

The expansion and improvement of the art of reinforcing concrete began several decades ago. There were two

different needs, one was for strengthening concrete beams and the other for strengthening concrete columns. The term reinforcing bar is usually applied in the art to a rod or bar used to reinforce a concrete beam against the tension longitudinal of the beam itself. The concrete itself has great power of resisting compression, but it has not tensile strength and its weakness manifests itself in cracking along the lower half of the beam. A steel bar placed below the middle of the beam furnishes the useful tensile resistance. But it was found that certain diagonal cracks developed in the beam toward the respective ends of the beam and it was sought to prevent these by minor auxiliary rods attached to the main reinforcing bar. This was the field which Vandenburgh entered and devised an arrangement, shown in Figure 1 of his drawings, of a reinforcing bar imbedded in the lower part of the beam with transverse loops or spirals, part on one side of the center of the bar and part on the other and fitted rigidly into the bar so that those on each side leaned at an angle away from the center and in an opposite inclination from those on the other. In strong construction, these spiral loops were doubled by a second spiral which meshed with the first. Now, as the specifications show, this arrangement of the bar and opposing spirals was to apply the truss principle to the strengthening of the beam and to give it the tensional resistance along the lower part of the beam and against the diagonal tensions near the ends of the beam. No one can read the specifications and examine the drawings without perceiving that this was the gist of the Vandenburgh invention. Reference is made to the use of the plan for column construction, but the only use of it for that purpose is shown in Figure 6, which discloses two upright reinforcing bars with their spirals meshing but connected in no other way.

The truss formation was not especially adapted to the needs and strains of the concrete column. The history of

that field in the art shows that one of the pioneers was a Frenchman named Considere, who some years before the plaintiff's patent had shown that the tendency of concrete in a column was to expand outwardly under the vertical pressure to which it was chiefly exposed and the best way of reinforcing columns was by pouring the liquid concrete into a hooping made of a series of independent hoops, or into a continuous helicoidal spiral or cylindrical helix of a steel wire or rod, of a stove pipe form. After him, column hooping became common in the art as the only practical method of column reinforcing and the convolutions of the spiral were spaced and supported by steel uprights with which they engaged in various ways. In one French patent, the convolutions were tied with steel wire to the spacers. It is the form of this engagement between the uprights and the spirals which is the crux of the present suit.

The preferred form of Vandenburgh for the engagement between his reinforcing bar and the spiral loops of his truss arrangement is by a kerf or cut in the edge of bar inclined away from its center in which the coil rod is placed and held therein by an integral spur forced downward upon the coil when inserted, which permanently retains it in position. The defendant has a rectangular cut in the edge of the T spacer or upright and retains the spiral rod in it by peening or hammering down the edges of the cut so as to keep the rod from slipping out, but leaving play enough to permit the collapsing of the spiral and shipment in its collapsed form. Others had adopted a similar form of engagement. Observing this, Vandenburgh who had not used or exploited his original patent in any way, went back to the patent office and secured a reissue in which he was permitted to broaden his first and second claims with respect to the kerfs and spurs so as to change the word "rigidly" used in the original claim to "permanently." Having done this, he

proceeded to sue in the second, third and sixth circuits persons using what he insisted were equivalents of his form of engagement in their column hooping reinforcement of concrete columns. All the courts, and there are six of them, have held these changed claims of the reissued patent to be void and to give him no right to claim infringement in the collapsible feature of the column hooping. The original specifications leave no doubt that the patentee used the word "rigidly" deliberately and properly because his truss, as he portrayed it, required rigid connection between the spiral loops and the main reinforcing bar. His making his form of engagement loose was an afterthought to catch makers who had not been advised in his specifications that there was anything collapsible in his truss formation. The reissue as to the first two claims was in the teeth of the admonitions of this Court speaking through Mr. Justice Bradley in *Miller* v. *Brass Co.*, 104 U. S. 350. They are therefore void.

Counsel for the patentee say now that the collapsible feature was only an incidental matter, and that what they now rely on is the combination under claims 3 and 5 of the reinforcing bar provided upon one edge with a series of kerfs each having an integral overlapping spur and a coil each convolution thereof being beneath one of the spurs. We do not think the respondent has this combination. We think the patentee's combination must be limited to a spiral with one bar in the truss formation, or at least one in which the spiral is free at one end and has no second support or spacer such as respondent uses. Patentee relies on Fig. 4 of his drawing and says that to add another spacer or bar is only the work of a mechanic; but he can not properly say so because Fig. 4 is only a detail of Fig. 1 of the drawings and was intended to be a lighter construction of the same beam with the same truss combination as shown in Fig. 1. Moreover, it is

perfectly obvious from the description and some of the claims that the spiral of Vandenburgh was intended to be free of all but the bar shown. This is made certain by Fig. 6 which is the only application of the device to column use shown and in that we have two bars standing upright each engaged with convolutions of a spiral, the loops of each spiral meshing with those of the other spiral but free of the other bar. It is clear to us that Vandenburgh having secured a patent for a truss form of reinforcement and finding it unworkable, for it never has been adopted in the trade or in any structure, is through reissue seeking to expand the paper combination he claims into a field in which it does not belong.

But it is insisted that Vandenburgh was the first to introduce into the field of concrete reinforcing the kerf and integral spur to clamp the spiral rod, that this involved invention, and that claim No. 3 should be construed to secure him a reward for this. It may be true that in the field of reinforcing concrete the kerf and spur had not been used before as Vandenburgh used it, but the kerf and spur were old in the art in kindred fields. They were old in metal working art. Exactly the equivalent is shown in sand screens for mixing the materials of concrete and in sustaining fence wires. It is difficult to differentiate the field of metal working from this art of reinforcing concrete because the problem was only one of spacing firmly the convolutions of the metal spiral and that was a well known device for such a need. We do not think the principle of *Potts* v. *Creager,* 155 U. S. 597, applies in this case. More than this in the very field itself, there was a prior German patent of Kieserling & Moller showing the use of the kerf for spacing a spiral in reinforcing concrete. It does not seem to us that it involved real invention merely to add a spur or clamp or to peen or hammer down the edges of the kerf so as to fix the spiral rod firmly. We find therefore that claims 3 and

5 were without merit as involving invention and that the action of the Circuit Court of Appeals should be

Affirmed.

CONCRETE STEEL COMPANY *v.* VANDENBURGH.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT.

No. 238. Argued January 17, 1923.—Decided February 19, 1923.

Decided upon the grounds expressed in *Vandenburgh* v. *Truscon Steel Co., ante,* 6.
278 Fed. 607, reversed.

CERTIORARI to a decree of the Circuit Court of Appeals sustaining a patent and awarding damages for infringement.

Mr. Thomas J. Johnston, with whom *Mr. Lucius E. Varney* was on the brief, for petitioner.

Mr. O. Ellery Edwards and *Mr. Carlos P. Griffin,* with whom *Mr. Joseph W. Cox* was on the brief, for respondent.

Mr. Solicitor General Beck, Mr. Assistant Attorney General Lovett and *Mr. Melville D. Church,* by leave of court, filed a brief on behalf of the United States, as *amici curiae.*

MR. CHIEF JUSTICE TAFT delivered the opinion of the Court.

This is a review of the decree of the Circuit Court of Appeals of the Second Circuit sustaining the validity of claim No. 3 of the Vandenburgh patent, just considered in the previous case of *Vandenburgh* v. *Truscon Steel Co., ante,* 6, and awarding $15,000 for profits to Vandenburgh for defendant's infringement. The two cases can not be distinguished. We must, therefore, reverse