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duties. That office belongs to the quartermaster's department. What the commissary provides to feed the army it is the duty of the quartermaster to transport to such points as may be needed. Hence, in the case before us, it was in the ordinary course of business, the contract for transportation being already made, and further supplies being needed, that the purchase of the same should devolve on the commissary department.

JUDGMENT AFFIRMED.

HICKS *v.* KELSEY.

The mere change in an instrument or machine of one material into another—as of wood, or of wood strengthened with iron, into iron alone—is not “invention” in the sense of the Patent Acts, and therefore is not the subject of a patent; the purpose and means of accomplishment, and form and mode of operation of each instrument—the new as of the old—being each and all the same. The mere fact that the new instrument is a better one than the old one—requiring less repair, and having greater solidity than the old one, does not alter the case. It does not bring the case out of the category of more or less excellence of construction.

APPEAL from the Circuit Court for the Northern District of Illinois; the case being this:

Hicks obtained a patent for an improved wagon-reach, and filed a bill against Kelsey, charging infringement and praying the usual relief. The defendant answered, denying the novelty of the alleged invention, and also denying infringement.

The thing called a “wagon-reach”—that is to say, a pole or shaft connecting the front and rear axles of wagons or carriages, and having an upward crook or curve in it, so as to allow the front wheel, which, when a carriage is turned, goes against the reach if straight, to pass under it—had confessedly long been made, and was public property. These had been made of wood, necessarily for the sake of strength of a certain thickness, and consisted of one piece, strengthened by straps of iron attached to each side of the reach.

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The supposed improvement of the plaintiff consisted precisely and only in leaving out the wood in *the curve* and bolting the iron straps together, whereby the curve became all iron and less bulky, but in all other respects having the same shape and performing the same office as before. About all this there was no dispute whatever. Instead of being bolted together, the straps might be welded so as to make the curve consist of solid iron.

The question was whether this change of material—making the curve of iron instead of wood and iron—was a sufficient change to constitute invention,—the purpose being the same (namely, to turn the wheel under the body of the wagon), the means of accomplishing it being the same (namely, by a curved reach), and the form of the reach and mode of operation being the same.

Witnesses were examined, whose testimony went to show that the iron reach had advantages over those of mere wood, or of wood and iron. One said that of thirty-five, which he had made in about two years, none had come back broken, or needing repairs; that this was not the case with the old sort.

Another said :

"My experience is that, in those made of wood and iron, the wood between the iron plates in summer contracts and loosens the bolts."

Another said :

"Hicks's reach being iron, the two plates come together as one whole substantially soldered. In the wooden one, the moment the shrinkage becomes such that the bolts become loose, each has to take its own part, and the transit of the trucks, moving from the right to the left, turning the friction from that, takes each separate strain from one and throws it on to the other, so it makes only the thickness of the one side—the one piece of iron—where otherwise it would be two plates together. The crooked part, right at the crook, would break, according to that arrangement, because the other part is stronger. It will break whenever it gets so it will vibrate, at the weakest point."

The court below decided that plainly there was nothing

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but a change of material, and that this—the purpose, means of accomplishment, form of the instrument, mode of operation, being all as in the old reach—was not a sufficient change to constitute invention. It accordingly dismissed the bill. From its action herein this appeal was taken.

Mr. S. A. Goodwin, for the appellant:

This invention does not consist in the *mere* substitution of a particular material for other material which had been previously used for the same purpose and in the same way. The invention consists in the production of a certain described article by a certain described mechanical process, which process, viewed as a whole, is new in itself. That process is, the making an ordinary wooden reach of two separate parts, in splicing those parts at the front and rear ends by a particular and new mechanical arrangement to a curved metallic intermediary splice, made substantially solid in two plates, or one casting, so that a new article is produced by a new mechanical arrangement or device,—a new curved reach. This article has added advantages and increased utility over the old wooden curved reach improved upon. They are shown in the proofs. Indeed, the matter is intelligible without proofs. The *curved* reach is indispensable, to prevent the wheel, when the carriage is turned and one of the front wheels put under it, from rubbing against the reach, lifting it up, and upsetting the carriage. But a curved reach must be made. One is rarely found in the natural growth of a tree. The curved part, when made, is necessarily weak, being usually made of wood sawed across the grain. To give strength the whole wooden reach has iron plates along it, fastened on both its sides with spikes or bolts. The wood and the iron shrink unequally, and the bolts all become loose. But when the central part is *all* made of iron alone, leaving the ends, for the sake of lightness, to be of wood alone, all this is obviated.

We say, then, that this *new material* in the crook or curve; with the *new method of attachment* at each end (the splice) to the two wooden parts; with the *new construction* of the reach

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as a whole; with the *new operation* in consequence of the change; with the *increased utility* and *beneficial results*, thus incontestably proved, bring this patent within the principle of all the cases as a patentable invention.

There are many cases in which the materiality of an invention, whether it be a machine or a process, can be judged of only by its effect on the result, and this effect is tested by the actual improvement in the process of producing an article, or in the article itself introduced by the alleged invention.*

No opposing counsel.

Mr. Justice BRADLEY, having stated the case, delivered the opinion of the court.

The question is whether the mere change of material—making the curve of iron instead of wood and iron—was a sufficient change to constitute invention; the purpose being the same, the means of accomplishing it being the same, and the form of the reach and mode of operation being the same.

It is certainly difficult to bring the case within any recognized rule of novelty by which the patent can be sustained. The use of one material instead of another in constructing a known machine is, in most cases, so obviously a matter of mere mechanical judgment, and not of invention, that it cannot be called an invention, unless some new and useful result, an increase of efficiency, or a decided saving in the operation, is clearly attained. Some evidence was given to show that the wagon-reach of the plaintiff is a better reach, requiring less repair, and having greater solidity than the wooden reach. But it is not sufficient to bring the case out of the category of more or less excellence of construction. The machine is the same. Axe-helves made of hickory may be more durable and more cheap in the end than those made of beech or pine, but the first application of hickory to the purpose would not be, therefore, patentable.

* Roberts *v.* Dickey, 4 Fisher, 532, per Strong, J.; and see McCormick *v.* Seymour, 2 Blatchford, 243—definition of a patentable subject, by Nelson, J.

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Cases have frequently arisen in which substantially the question now presented has been discussed. Perhaps, however, none can be cited more directly in point than that of *Hotchkiss v. Greenwood*,* in which it was held that the substitution of porcelain for metal in making door-knobs of a particular construction was not patentable, though the new material was better adapted to the purpose and made a better and cheaper knob—having been used for door-knobs, however, before. So, in a case at the circuit, referred to by Justice Nelson in the last-named case,† the substitution of wood for bone as the basis of a button covered with tin was held not patentable.

In *Crane v. Price*,‡ it is true, the use of anthracite instead of bituminous coal with the hot-blast in smelting iron ore was held to be a good invention, inasmuch as it produced a better article of iron at a less expense. But that was a process of manufacture, and in such processes a different article replacing another article in the combination often produces different results. The latter case is more analogous to the cases of compositions of matter than it is to those of machinery; and in compositions of matter a different ingredient changes the identity of the compound, whereas an iron bar in place of a wooden one, and subserving the same purpose, does not change the identity of a machine.§

But the plaintiff's counsel alleges that his invention does not consist of the mere substitution of a particular material for another material which had been previously used for the same purpose in the same way, but consists in the production of a certain described article by a certain described mechanical process, which process, viewed as a whole, is new and useful; and then he describes what he supposes to be such new mechanical process. This is his argument; but the facts do not bear out such a view of the case.

In our judgment, the patent in this case is void for want of novelty in the alleged invention.

DECREE AFFIRMED.

* 11 Howard, 248. † Ib. 266. ‡ Webster's Patent Cases, 409.

§ See *Curtis on Patents*, 3d edition, §§ 70-73.