

Syllabus.

GATES IRON WORKS *v.* FRASER.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR
THE NORTHERN DISTRICT OF ILLINOIS.

No. 253. Argued March 8, 1894. — Decided May 14, 1894.

The claims covered by letters patent No. 56,793, issued July 31, 1866, to Henry Pearce for "a new and useful machine for crushing and pulverizing quartz-rock, stone, and any description of ores," were not infringed by the machine made by the defendants, and were, in some respects, anticipated by the invention patented to Jonathan F. Ostrander by letters patent No. 4478, dated April 25, 1846; by the invention patented to George H. Wood by letters patent No. 28,031, dated April 24, 1860; and by the invention patented to James W. Rutter by reissued letters patent No. 3633, dated September 7, 1869.

The invention patented to Charles M. Brown by letters patent No. 201,646, dated March 26, 1878, for "a new and useful improvement in ore-crushers," was in its general features a reproduction of the machine patented to James W. Rutter by reissued letters patent No. 3633, dated September 7, 1869; and, in view of the prior patents to Rutter and Tripp, must receive a narrow construction, which frees the defendants from the charge of infringing them.

The invention patented to George Raymond and Albert Raymond by letters patent No. 237,320, dated February 1, 1881, for "improvements in grinding mills," was for a combination which included several features not found in the machines made by the defendants.

The function of the safety pin in letters patent No. 110,397, issued to John H. Rusk, December 20, 1870, and antedated December 9, 1870, is practically the same as that of the pin in the combination patented to George and Albert Raymond.

The claim in letters patent No. 243,343, issued June 21, 1881, to Philetus W. Gates for the segmental cast-bearing for the ball of the socket joint, having a form which gives it a bearing contact upon the ball, was anticipated by machines constructed by Charles M. Brown and in public use more than two years before Gates applied for his patent.

The claim in letters patent No. 243,545, issued June 28, 1881, to Philetus W. Gates for a novel application of a loose collar around the eccentrically gyrating shaft to prevent dirt from getting into the bearing, was anticipated in the Brown machine, as changed in 1878, by a circular washer or collar upon the top of the sleeve that surrounded the breaking head, which fitted around the shaft.

The invention patented to Philetus W. Gates by letters patent No. 246,608, dated September 6, 1881, viz., a device for a depression or groove in the outer bearing surface of the bearing-box, and applying within this de-

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pression a removable portion of carbon-bronze metal, so as to correct the wear of the machine at that place, is void for want of patentable invention.

The alleged invention in letters patent No. 250,656, issued December 13, 1881, to Philetus W. Gates, is for a combination of old features, viz., a shaft, a bearing for the shaft, a hard metal plate in the lower end of the shaft, an adjustable sliding step block, an oil step box, and a hard metal plate at the end of the shaft, all of which, except the metal plate, were present in the Brown machine as made and sold more than two years before Gates applied for the patent; and the metal plate was old and in use for the same purpose as in Gates's machine long before his application.

The use of safety pins for saving machinery from the strain of a sudden jar did not involve patentable invention.

A verbal assignment of an interest in letters patent is held to have no force or effect against a subsequent assignee claiming under a formal written transfer, and having no knowledge of the previous verbal transfer.

At the March term, 1890, of the Circuit Court of the United States for the Northern District of Illinois the Gates Iron Works, a corporation organized under the laws of the State of Illinois, filed its bill of complaint against David R. Fraser, Thomas Chalmers, and Hiram H. Scoville, alleging that the said complainant was the sole owner of several letters patent of the United States, namely, No. 56,793, issued to Henry Pearce, July 31, 1866; No. 201,646, issued to Charles M. Brown, March 26, 1878; No. 237,320, issued to George and Albert Raymond, February 1, 1881; No. 110,397, issued to John H. Rusk, December 20, 1870; No. 243,343, issued to P. W. Gates, June 21, 1881; No. 243,545, issued to P. W. Gates, June 28, 1881; No. 246,608, issued to P. W. Gates, September 6, 1881; and No. 250,656, issued to P. W. Gates, December 13, 1881; and which said letters patent, and the inventions and improvements therein described, had, by assignments in writing, prior to the commencement of the suit, become vested in the complainant. The bill further alleged that the defendants were making, using, and vending machines embodying the said inventions, in disregard of the rights of complainant, and prayed for the usual relief.

The defendants filed a joint and several answer, admitting that the letters patent mentioned in the bill had been issued,

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but denying that the persons to whom they had been granted were the original and first inventors of the several inventions described and claimed therein, or that the defendants had infringed, or were infringing, the rights of the complainant in the said inventions.

The answer further averred that the defendant Hiram H. Scoville had, prior to the filing of the application by Charles M. Brown for a patent for the improvements described and claimed in said patent No. 201,646, dated March 26, 1878, by and with the consent of the said Brown, made and put into use two machines containing the inventions secured by said patent No. 201,646, and that the defendants had a right to make and sell machines containing said inventions by virtue of an oral license given by Brown to Scoville before the application for said patent was filed.

The answer further alleged that P. W. Gates was not the original and first inventor of the improvements described in the several patents Nos. 243,343, 243,545, 246,608, 250,656; but that substantially those improvements were invented by said Charles M. Brown before the supposed invention thereof by Gates, and were embodied and exemplified in certain full-sized working machines built by the said Hiram H. Scoville, which were publicly used more than two years before Gates made application for any one of the said four patents.

The answer further stated that Henry Pearce was not the original and first inventor of the improvement patented by said patent No. 56,793, dated July 31, 1866, and that substantially the same thing was shown and described in letters patent No. 28,031, issued to one G. H. Wood, dated April 24, 1860.

Subsequently the defendants, with leave of court, filed the following amendment to the answer, to wit:

“Letters patent to J. F. Ostrander, granted and dated April 25, 1846, No. 4478, ‘grain mill.’

“And as to the patent mentioned in said bill of complaint as having been granted and issued to J. H. Rusk, Charles M. Brown, G. and A. Raymond, and the four patents to P. W. Gates, numbered respectively 243,343, 243,545, 246,608, and 250,656, they further aver, upon information and belief, that

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the said Brown, Raymond, Rusk, and Gates were not the original and first inventors of the things patented by or to them respectively, and that substantially the same things were patented by or shown and described in the following letters patent, to wit :

“As to patent to H. Pearce, No. 56,793.

“Letters patent to J. F. Ostrander, granted and dated April 25, 1846, No. 4478, for improvement in grain mill.

“Letters patent to G. H. Wood, granted and dated April 24, 1860, No. 28,031.

“As to patent to J. H. Rusk, No. 140,397.

“Letters patent to A. C. Ellithorpe and I. Scoville, granted and dated November 23, 1858, for improvements in machine for breaking stones, etc., No. 22,113.

“Letters patent to Hiram H. Scoville, granted and dated May 26, 1868, No. 78,332, for improvement in stone breaker.

“As to patent to C. M. Brown, No. 201,646.

“Letters patent to Charles Tripp, granted and dated November 10, 1857, No. 18,610, for improvement in grinding mill.

“Letters patent to Conrad P. Wagner, granted and dated January 30, 1866, No. 52,347, for improvement in quartz mill.

“Reissue letters patent to James W. Rutter, granted and dated September 7, 1869, No. 3633, for improvement in ore crusher.

“As to chilled iron, V. I. Knight's American Mechanical Dictionary, published in New York, 1874, p. 537. Title ‘Chill.’

“As to patent to P. W. Gates, No. 243,343.

“Letters patent to L. Fagin, granted and dated October 30 1866, No. 59,201, for improvement in hanging millstones.

“Letters patent to S. N. Taylor, granted and dated February 27, 1866, No. 52,908, for improvements in knuckle joint.

“As to patent to P. W. Gates, No. 243,545.

“Letters patent to Charles Tripp, granted and dated November 10, 1857, No. 18,610, for improvement in grinding mill.

“Letters patent to Conrad P. Wagner, granted and dated

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January 30, 1866, for improvement in quartz mill, No. 52,347.

“Letters patent to Thomas Varney, granted and dated April 9, 1867, No. 63,675, for improvement in quartz mill.

“As to patent to P. W. Gates, No. 246,608.

“Letters patent to H. Pearce, granted and dated July 31, 1866, No. 56,793, for improvement in quartz mill.

“As to patent to P. W. Gates, No. 250,656.

“Letters patent to P. W. Gates, granted and dated June 28, 1881, No. 243,545, for improvement in rock or stone breaker.

“Letters patent to Daniel Hughes, granted and dated February 20, 1866, No. 52,716, for improvement in quartz crusher, etc.

“Letters patent to L. Fagin, granted and dated October 30, 1866, No. 59,201, for improvement in hanging millstones.

“English letters patent to Claude Marie Savoye, No. 6195 of 1831, for improvement in machinery for grinding grain and other substances.

“The defendants, further answering, say upon information and belief that some of the older ones of complainant's said patents show and describe improvements which are claimed in other and later of the complainant's said patents, and they further say that as to the said several patents by them herein and hereintofore mentioned are shown and described devices, parts, or combination of parts that are substantially the same as the devices and combinations set forth in other patents than those to which they are specifically named as relating, and that any and all of said patents will be referred to as containing the substance of any or either of the complainant's said patents as may be deemed appropriate.”

The cause was put at issue, a large amount of evidence taken, and after argument on March 31, 1890, the court below dismissed the bill at complainant's costs. From this decree an appeal was taken to this court.

Mr. Lewis L. Coburn for appellant.

Mr. L. L. Bond, (with whom was *Mr. C. E. Pickard* on the brief,) for appellees.

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MR. JUSTICE SHIRAS, after stating the case, delivered the opinion of the court.

The patents that are before us for consideration are for improvements in stone-crushing machines. We shall preface our discussion of the questions that arise by adopting from the brief of the plaintiff in error the following description of the final and perfected form of the machine, and which is claimed to embody the various inventions and improvements covered by the several patents:

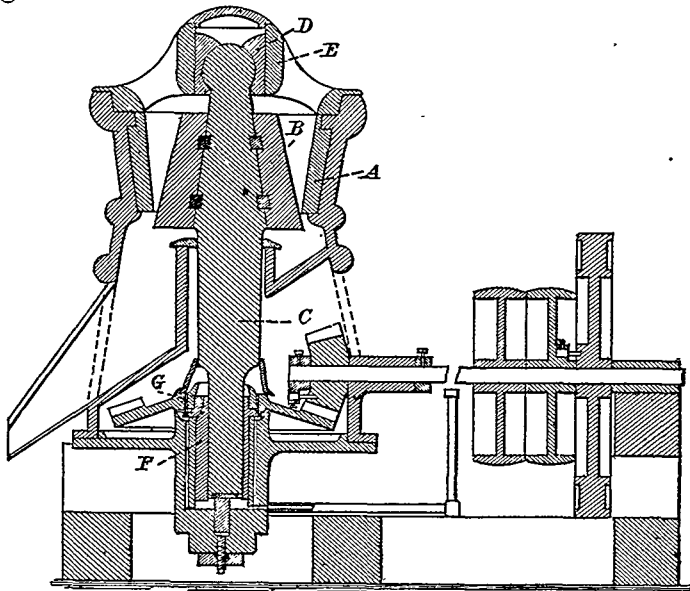
“The inventions of these various patents can be more readily understood by first understanding the construction of this type of stone-crushing machines which has become to be known as the gyratory type of stone crushers. This name comes from the fact that the crushing cone is carried on a vertical shaft which has its bearing at one end in the axis of the conical enclosing case which surrounds the crushing cone, while the bearing of the other end of the cone shaft is eccentric to the axis of the enclosing or surrounding conical cylinder which surrounds the crushing cone. This vertical shaft which carries the crushing cone of the machine is loose in its bearings, but the end of this shaft which is eccentric to the axis of the enclosing conical case or cylinder of the machine is carried around in a circle by being placed in an eccentric box in a gear wheel that is revolved on its centre, which centre is in the axis of the enclosing case or cylinder of the machine. The shaft which carries the crushing cone describes in its movement, when the machine is in operation, a conical orbit around the vertical axis of the enclosing conical cylinder of the machine. The stone to be crushed is dumped into the top of the machine between the crushing cone and the cylindrical conical case or shell which surrounds it, the cone shaft is carried around in its conical orbit, the crushing cone impinges the ore or rock between it and the surrounding case or cylinder, and crushes it. The shaft or arbor of this crushing cone being loose in its bearings, it does not rub or grind the stone, but simply cracks it into finer pieces, and then impinges the next pieces of ore or rock, and so on around the entire

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conical orbit, the space between the crushing cone and the enclosing conical case or cylinder opposite of where the ore or rock is being cracked or broken becomes greater by reason of the crushing cone being carried to the opposite side of the enclosing case or cylinder, and the broken rock falls down into a narrower space, and when the crushing cone comes around again, it is again broken, until it is sufficiently fine to pass out at the bottom of the space between the crushing cone and its enclosing case or cylinder.

“This construction of ore crushers, or stone breakers, as they are frequently called, is a continuous feed machine, the stone being constantly fed in at the top of the machine in a coarse state, and continuously passes out at the bottom of the crushing space, broken to a certain definite size, which is fixed by an adjustment of the crushing cone in the enclosing case or cylinder.”

This form of machine is illustrated in the following drawing:



Vertical Sectional View of Machine.

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In this cut A represents the conical enclosing case or cylinder which surrounds the crushing cone B, which is rigidly attached to and is carried on the vertical shaft or arbor C. The top or upper end of the arbor C has a bearing in the chilled section box D that is held in an open spider-frame E, this bearing being exactly in line of the axis of the enclosing conical case or cylinder A. The bottom or lower end of the shaft C has its bearing in what is termed an eccentric box, F, which is placed in the gear wheel G. This eccentric box is placed at one side of or eccentric to the vertical axis of the enclosing case or cylinder A. The gear wheel G is supported on the base of the machine, so that the centre of its hub is exactly in line with the vertical axis of the enclosing conical case or cylinder A, and when it is revolved it carries the lower end of the shaft or arbor C, around in a circle, and consequently continually brings the conical crushing cone B in closer proximity to one side of the enclosing case or cylinder to impinge the stone contained in the enclosing case or cylinder, and that impingement is continually changing from one place to another throughout the entire circle, and the space opposite of the place of impingement between the crushing cone and its enclosing case or cylinder is wider than where the impingement of the ore or stone is taking place. This particular motion of the crushing cone and its shaft or arbor has been termed a gyratory motion. The shaft or arbor is never vertical, and one of its bearings is in an eccentric box placed eccentric to the bearing of the other end of the shaft or arbor, and eccentric to the axis of the enclosing case or cylinder. The crushing cone and its shaft or arbor describes at each revolution of the geared wheel in which the eccentric box of the shaft or arbor is placed, a conical orbit.

It is claimed by the plaintiff in error that this form of machine is the composite result of the application of the improvements described in the patents set up in the bill. To test the soundness of this claim it will be necessary for us to look into the condition of the art prior to the issue of the earliest patent owned by the complainant, that is, prior to July 31, 1866, the date of letters patent No. 56,793, granted to Henry Pearce.

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The first patent to which our attention has been particularly directed is that issued April 25, 1846, to Jonathan F. Ostrander, and numbered 4478. It is a claim for an improvement in grinding mills, and the nature of the invention is said to consist in "making the surfaces of the stones, or metallic plates, between which the material is ground, the one convex, the other concave, . . . and also in giving the movable plate or stone a compound motion, consisting of, firstly, an oblique gyrating motion of its axis around the axis of the fixed plate; and, secondly, a rotating motion around its own axis." The material to be ground is fed to the mill by being placed in a cup-shaped opening in the top of the shell that encloses the machine, and the ground material is received in a gutter surrounding the base. We here perceive the double motion, that is, "the revolving and rolling motion," which is a feature of the Pearce patent, and the operation of the two machines is similar in that, in both, the pestle alternately closes upon and recedes from the sides of the outer shell, so that any substance or material to be ground is thereby crushed, and passes downward to the lower part of the machine, where the space gradually lessens, and is crushed finer.

The patent No. 28,031, granted April 24, 1860, to George H. Wood, was for a machine for crushing stone, quartz, ores, or any other substance capable of being reduced or pulverized by pressure. The specification describes a machine having an outer shell or case and an interior cone or pestle, which has an eccentric motion. We shall hereafter show that the machine made by the defendants does not contain the distinguishing features of the Pearce patent. But we have briefly described the inventions of Ostrander and of Wood to make it to appear that machines composed of an outer shell or case enclosing an outer cone or pestle, and operating on the material to be crushed by an eccentric motion, were known to the art.

Letters patent No. 88,216, dated March 23, 1869, reissue No. 3633, dated September 7, 1869, were granted to James W. Rutter for an improvement in ore crushers, and in which it is stated that the invention related to that class of crushing

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and grinding machines in which a conical grinder or crusher, with concentric and eccentric bearings, is operated within a stationary upright cylinder or chamber, or in which the crushing chamber is made conical and the crusher straight. There are other special features contained in this patent not relevant to our present inquiry, but this patent does provide for grinding ore or other material introduced at the upper or top end of the machine, and subjecting it to a continuous crushing and grinding force till it reaches the bottom, where it is discharged into a gutter or annular space.

With this brief view of the state of the art we shall now examine the letters patent upon which the complainant directly relies. The first is that which was granted to Charles M. Brown, No. 201,646, dated March 26, 1878.

The object of this invention is described as being "to furnish a strong, compact machine, in which large pieces of ore may be broken into smaller fragments by the regular continuous movements of the mechanism, and also in which the power used for crushing the ore shall be applied in a more advantageous manner than has been done heretofore in machines designed for this purpose."

The specification describes a machine composed of an outer shell or case, with an opening on one side for the egress of the crushed ore. Within this outer shell is an upright shaft or spindle, whose upper end is pivoted within a circular cap or cover, which is accurately fitted within the top of the outer shell. The lower end of the shaft is pivoted in a bearing in the hub of a bevel gear, and this bearing is placed in an eccentric position with reference to the centre of the hub. The end of the shaft rests on a loose plate or button, which is raised or lowered by an adjusting screw, which passes through the lower part of the hub in a line with the axis of the shaft. The upper part of the shaft, below the place where it is pivoted in the cap, is contracted into a neck, and below this neck it is enlarged in the form of a pyramidal section, so as to receive a conical breaking head, which is accurately fitted on the shaft. The outer shell or case is lined with a hard or durable material, made in sections so that they may be readily

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replaced by similar pieces when they are worn out by use, and their wearing surfaces may be either smooth or corrugated. The ore is fed into the machine through openings in the head, and falls into the space between the outer shell, lined as before mentioned, and the breaking head. When the driving mechanism, which is not claimed as a part of the invention, is set in operation, the breaking head receives an eccentric gyratory motion from the eccentrically-placed bearing in the hub of the gear below, and advances successively towards every portion of the outer shell, crushing the ore that is contained between these two surfaces. As the breaking head advances on one side it recedes on the opposite, thus allowing the partially broken ore to fall still lower in the space between the shell and the breaking head, to be again and again acted upon until it is reduced to fragments sufficiently small to pass through an opening at the bottom of the chamber. Here it falls upon an inclined plate and passes out of the machine through the opening in the side of the shell. The claims of the inventor were substantially for the combination of the gyrating spindle; the conical breaking head with the breaking interior surface of the shell; the sliding socket bearing in which the upper end of the shaft operates; the eccentric bearing at the lower end of the shaft, and the adjusting screw which raises or lowers the shaft. His fourth claim was as follows: "In our ore-breaking machine, a shell or case frame, enclosing at its upper part a concave breaker, and provided with an oblique trough, integral with the frame, the inner edge of which extends upwards and within the concave base of the breaker all around, and having a low-down discharge at one side."

It will be seen that, in its general features, this machine is a reproduction of that of Rutter. In both we find the outer shell; the shaft to which a gyrating motion is given by the eccentric bearing at the lower end, and which shaft works at the upper end in a ball and socket joint, and the crusher or breaking head of a conical form. The operation of the machines is similar in that the material to be crushed is fed into the machine at the top, and passes down between the inner surface of the shell and the breaker, and the gyrating motion

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of the shaft causes the breaking head to so operate that, as it approaches the shell on the one side it departs from the other side, thus permitting the partially broken ore to fall further down in the chamber, and thus to be exposed over and again to the crushing operation of the breaking head. It is true, however, that the Rutter machine operates differently from that of Brown's, because its crusher or breaking head does not revolve on its own axis. There are also some minor features in which the machines differ, but such minor features of the Brown machine are not found in the defendant's machine.

The next patent, in chronological order, set up in the bill, is that numbered 237,320, granted February 1, 1881, to George Raymond and Albert Raymond. It claims to cover certain improvements in that class of mills in which vertical metallic grinding disks are employed, and the invention is said to consist in "the combination of the driving shaft, grinding or reducing devices having an exposed hub or bearing, and a safety pin connecting said parts, and in minor details."

As the claims in this patent are for a combination which includes several features not found in the machine as made by the defendants, we need not dwell upon it further than to observe that among the devices described is that of a "safety pin," made of wood, which connects the rotary disk with the shaft, and the object of which is to relieve the strain or wrench which is sometimes given to the machine by some stone or metal of a hardness too great to yield to the crushing operation. The pin, which is strong enough to hold the rotary disk in its connection with its shaft when the material is capable of being crushed, breaks when a refractory substance is suddenly encountered, and thus permits the disk to stop, while the shaft is permitted to continue its motion. The offending substance is then removed, and the broken pin is removed and replaced by a new one. We shall have occasion to revert to this safety pin when we reach the question of infringement. But in this connection we may briefly refer to the patent No. 110,397, issued to John H. Rusk, December 20, 1870, and which is also set up in the bill. The feature of this patent which concerns our inquiry is the use of safety pins, whose

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function is the same with that of the Raymond patent, with the difference that the Rusk pins are made of soft metal, strong enough to hold the driving shaft and the spindle together in all ordinary grinding operations, but weak enough to yield when any extraordinary strain is put on the machine by the accidental introduction of a substance too hard to be crushed. Another difference is that, in the Rusk machine, the pins are placed between the two driving gear wheels, which it is necessary to remove in order to get at the safety pins to remove them or replace them, while, in the Raymond machine, the safety pins are placed in an accessible position, so that they can be removed without disturbing other parts of the machine.

Continuing our history of the complainant's machines, we come now to No. 243,343, issued to P. W. Gates, June 21, 1881. It is for an alleged improvement for ball joints of stone breakers and other machines, and consists mainly in constructing bearings in which the ball works so hardened or chilled on the internal surface of the bearing as to offer but slight friction to the ball which fits and works within it. Further reference will be had to this patent when we treat the question of infringement.

We next come to No. 243,545, issued to P. W. Gates, June 28, 1881. The specification, in terms, refers to letters patent No. 201,646, issued March 26, 1878, to Charles M. Brown, and claims for certain improvements to the Brown machine. The machine as a whole is a reproduction of the main features contained in the Brown and Rutter machines, but exhibits some changes and improvements in details, to which we shall hereafter refer.

On September 6, 1881, letters patent No. 246,608 were granted to P. W. Gates, and are now the property of the complainant company. This is a claim for an improvement in eccentric revolving bearing boxes for ore crushers and stone breakers. The inventor, in his specification, says: "My invention relates especially to the revolving eccentric bearing box employed at the lower end of the gyrating shaft of stone breakers and ore crushers, and the nature of my invention

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consists in providing the thicker or eccentric portion of said bearing box with a depression or groove in its outer bearing surface, and applying within this depression a removable portion of carbon bronze metal or other suitable durable wearing metal, said removable portion of metal being of a segmental form and extending partly around the circumference of the eccentric bearing box proper, and also extending vertically from or nearly from the upper to the lower ends of said box proper, and being adapted for being secured in position by bevel flanges at the edges of the depression or groove, or by other suitable means provided on the bearing box proper, and on the removable portion of metal or by said flanges, together with screws or dowels. It also consists in the combination of the box proper, having a peculiarly formed depression or groove in its periphery, and a peculiarly formed removable carbon bronze metal or other suitable bearing metal portion whereby greater strength in the parts is secured." The practical necessity for this improvement is said to arise out of the fact that there is a destructive wear on the periphery of the bearing box, especially at the place where the box is made with an increased thickness opposite one side of its eccentric bore. In practice, it is said that this wear operates to change the throw or motion of the eccentric, thus impairing the effective capacity of the machine, and it is claimed that this defect is remedied by the use of the removable bronze metal. When the wear becomes so great as to injure the operation of the machine, the bronze can be removed and another portion of bronze metal put in its place, and thus dispense with procuring a new eccentric box.

Still another improvement was patented by P. W. Gates by letters issued December 13, 1881, and numbered 250,656. This invention relates to alleged improvements in the shaft of ore-crushing machines, and in the method of applying oil to the machinery while in place and in motion, and calls for no special attention at this stage of our inquiry.

The defendants' machine, as described by W. S. Bates, an expert called on behalf of the defendants, has an outer shell or case; a crushing cone within the shell, mounted on a

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shaft; a fixed bearing for the upper part of the shaft; an eccentric bearing for the lower part of the shaft, by which it is made to travel in a circular path; a step bearing for the lower end of the shaft to take the thrust due to the weight and the crushing effort, and suitable gearing operating on the eccentric bearing to revolve the same.

The stress of the case is in the effort of the complainant's witnesses to establish an infringement in the defendants' machine of the Pearce patent and of the Rusk patent.

Undoubtedly, the leading features of the Pearce machine are found in that of the defendants. There are the conical shell or case; a conical crusher within the shell; a shaft on which the crusher is secured; a pivotal point at the lower end of the shaft, and an eccentric bearing at the upper end of the shaft, whereby the shaft and the crushing cone are caused to revolve in a conical orbit. But, as we have heretofore seen, these are present in the Wood machine, a prior invention. The Wood patent shows a stone-crushing mill consisting of a conical shell, a conical crusher within the shell, a shaft on which the crusher is mounted, a fixed pivotal point at the lower end of the shaft, and the crusher revolves in a conical orbit. The mode of operation is the same in the two patents — that is, the material to be crushed is fed into the top of the machine, the sides of the crushing cone are caused to approach and recede from the sides of the shell, so as to crush the material, the motion being greatest at the top, where the large lumps are, and least at the bottom, so that the material is finely reduced, and passes out at the bottom. The modes of supporting and adjusting the crushing head and shaft are mechanically different. Some of these principal features are likewise to be seen in the Ostrander machine under a still older patent.

The infringement of the Rusk patent is said to be in the use in the defendants' machine of the safety break pins; and it must be conceded that the defendants do use such a device. Rusk does not claim the invention of the pin. What he does claim is "the combination of soft-metal pins or plugs with the driving gear of a grinding mill."

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Hiram H. Scoville, one of the defendants' witnesses, testified that the use of breaking pins was common in large machines; in a brick machine as far back as 1860; in the Blake ore crusher in the form of a breaking link; and in machines used in the shop of the witness in 1875.

Bates, defendants' expert, testified that "there is nothing new in the use of such safety devices for such a purpose. Their use is common in all classes of machines which are liable to sudden or unexpected strains. I have here two examples of safety pins applied to cultivators, to wit: patent No. 11,379 to G. Lichtenthaler, July 25, 1854, and patent No. 75,669 to J. D. De Turk, March 17, 1868. Both of these patents show cultivator teeth, arranged with wooden pins, for the purpose of having the pins break should the teeth strike a root or stone, the object being to prevent the breaking of the machine."

We do not perceive that this testimony was controverted by the complainant's witnesses. The complainant's expert does indeed claim that the patents referred to as showing the prior use of safety pins do not show such use in combination with driving gear. But, assuming that the use of safety pins for saving machinery from the strain of a sudden jar was old, we cannot regard their use, for such a purpose, in connection with the driving gear of a stone-crushing machine, as patentable. It is also to be observed that Rusk expressly limited himself to a soft-metal pin, and thus limited, the use of wooden pins being old, no infringement would be shown by defendants' use of a hard cast-iron pin.

Coming now to the Brown patent, and not regarding, at this stage of the discussion, the defendants' claim of a license, we have to consider the claim of infringement. The claims asserted are the 2d, 3d, and 4th. There is no pretence of infringement of the 1st claim, for the reason that the defendants' machine does not have the adjusting screw, the main feature of that claim.

A comparison of the Brown patent, in the particulars relied on, with the prior Rutter and Tripp patents, satisfies us that, even if some of his additional devices were deemed novel, it is

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plain, from the history of such machines, that his claims, to be saved, must receive a very narrow construction. Thus limited, they are not infringed in defendants' machines. We dismiss this part of the case by adopting the views of the court below: "Claims 2, 3, and 4 of the Brown patent are involved in this suit. The fourth claim is limited to a shell enclosing at its upper end a concave breaker, and provided with an oblique trough 'integral with the frame, the inner edge of which extends upwards and within the concave base of the breaker 6 all around.' This claim was allowed on the ground that this feature of the combination was an improvement on anything contained in the prior art. One element in the combination covered by the second claim is the 'breaking head 6, constructed with a concave base as shown.' Both the drawing and the specification show a concave breaking head, into which the shell or trough extends. The trough or shell is cast integral with the case shell. These claims cannot be broadened by eliminating or disregarding any of their language. The breaking head of the defendants' machine is not concave, and it follows that their machine has no trough extending upward and within the concave breaking head. The defendants' machine, therefore, infringes neither the second nor the fourth claim of the Brown patent. The defendants' machine does not contain the spindles with the sliding bearing mentioned in Brown's third claim, or any other sliding bearings, and the adjusting screw or step embraced in the third claim is not found in the defendants' machine."

The defendants, in the fifth paragraph of their answer, aver that, prior to Brown's application for patent No. 201,646, H. H. Scoville, one of the defendants, by and with Brown's consent, made and put into use two machines containing the invention described in that patent, and that by virtue of an oral license thus given by Brown to Scoville the defendants have a right to make and sell machines containing inventions covered by said patent. Scoville testifies that, in consideration of assistance given by him to Brown in bringing out his invention, the latter had verbally agreed that he, Scoville,

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was to have a half interest in the exclusive manufacture of the ore breakers, but that Brown had never made an assignment of such interest in a legal form. Brown himself testifies to the same effect. But, as it appears that subsequently Brown assigned these letters patent to the complainant company, and as there is nothing to show that the latter had any notice or knowledge of Scoville's interest, we think that no effect can be given to this alleged verbal license or interest.

In the sixth paragraph of their answer the defendants allege that, before P. W. Gates made application for either one of the four patents issued to him, the same improvements that were described in the Gates patent were known to and used by Brown and Scoville; that said improvements were invented by Brown, and were embodied by Scoville in full-sized working machines, and which machines were publicly used more than two years before Gates' application for his patents.

The history of these two machines is given by Scoville and Brown. The former testifies that in the early part of 1878 he made two machines under the Brown patent. He says that he and Brown loaned them to other parties to test their value as stone breakers. The first was loaned to the Kirby & Howe Stone Company of Iowa, who operated the machine for nine months, when they broke the cast-iron shaft, and then returned the machine. This machine was repaired in the works of the Gates & Scoville Iron Works Company, of which Scoville was then vice-president and superintendent. This machine was then sold to the Chicago City Railway Company, and has since been used by them. He further testifies that the second machine was loaned to General McDowell, in charge of the custom-house, then in course of erection at Chicago, and several thousand tons of concrete and slag for the foundation were broken by this machine. It was then returned to Scoville, who says he made some repairs on it, and also some changes which have since been adopted and claimed by the complainant company. This machine was afterwards sold to Smith Bros., of Marion, Ohio. Brown testifies that one of these two machines was made in 1877,

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and sold on trial to Mr. Kirby of Iowa, during the fall of that year; that the second one was in the shop of Scoville during the summer of 1878, and loaned the following winter to be used in breaking stone for the construction of the United States custom-house.

Scoville further testified that these two machines were at first made in the manner described in the Brown patent, but that on their return by the parties to whom they had been loaned they were somewhat changed. Those changes he thus describes: "They were changed by my own order, and under my superintendence, with Mr. Brown's advice, the old breaking heads being worn, and requiring new ones. We made a change in the new heads from the old by cutting off the lips that form the concave for the head, making the head level on the bottom, and also cutting off the top of the annular ring that projects up from the trough, so as to make room for a washer or riding ring, which ring we put on to keep the dust out from the gear. We also took out at that time the wedges in the top of the machine for adjusting a section of bearings around the ball, and put in sections that just fitted. That was all the change that was made. My recollection is that it was in November, 1878, in respect to the breaker sold to the Chicago City Railway Company. The second was somewhat later." He further testified as to a provision that was made by grooves to receive zinc or other metal that might be filled in to form a collar for the purpose of keeping the head from working off.

Brown's testimony is to the same effect, but he goes more into detail. Among other important changes that he alleges were made was that made at the top of the machine by leaving out the adjustable wedges around the socket bearing, and making this bearing to fill the space around the shaft inside of the head at the top of the machine, and that the segments that supported the ball at the upper end of the shaft were introduced in place of the wedges and were made or cast on a round chill, with pieces of sheet iron placed in the mould where the junction of the segments was designed to be, so that after the casting was made it could readily be spread

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apart into four pieces. He also states that he put a breaking pin between the driving shaft and the gear, but this was modified by placing the breaking pin between the driving pulley and a hub which was fastened on the countershaft. All these changes were made in 1878, and none of them, according to Brown, were made by the design or suggestion of P. W. Gates.

P. W. Gates, on behalf of the complainant company, testified that two machines were made by Brown, one of which was used by the Kirby-Howe Company of Iowa, and which was returned about September 1, 1878. The other, built by Brown or Scoville, was loaned to the United States government to use at the custom-house, and was returned. He admits that, in repairing these two machines, considerable changes were made, exhibiting features not shown in the original Brown patent, but he claims that these changes were devised by himself.

But whether these improvements were attributable to Brown, as testified by Scoville and Brown, or to Gates, as he testifies, is not specially important. What is important is the fact, that it thus appears that several of the features claimed in the Gates patents were illustrated in these two reformed Brown machines, actually in public use more than two years before Gates applied for his patents.

The claim of Gates No. 1, for the segmental cast bearing for the ball of the socket joint, having a form which gives it a bearing contact upon the ball, is found in the Brown reformed machine. The claim in Gates No. 2, of a novel application of a loose collar around the eccentrically-gyrating shaft, to prevent dirt getting into the bearing, was anticipated in the Brown machine as changed in 1878, by a circular washer or collar upon the top of the sleeve that surrounded the breaking head, which fitted around the shaft, the object being to keep the dust from the machinery below.

We agree with the court below in thinking that the first claim in Gates' patent No. 3, for the device of a depression or groove in the outer bearing surface of the bearing box, and applying within this depression a removable portion of carbon bronze metal, so as to correct the wear of the machine

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at that place, can scarcely be deemed an invention, as the use of soft metals for that function is shown to be old. At all events, the defendants' machine uses Babbitt metal over the entire surface; that is, going entirely around, instead of only a portion of the distance. In this respect defendants' machine follows the Brown amended machine. Nor can any force be given to Gates' claim that the use of the Babbitt or carbon bronze metal in the depression or groove is a new article of manufacture. Whether or not such a device, as a merely incidental feature of a compound machine, can be deemed a new article of manufacture, there is no proof of infringement, as it is not pretended that the defendants have ever made any such new article of manufacture. The alleged invention in Gates' patent No. 4 is for a combination of old features, to wit: a shaft, a bearing for the shaft, a hard metal plate in the lower end of the shaft, an adjustable sliding step block, and an oil step box.

All the elements of this combination were shown to be present in the Brown machine as made and sold more than two years before Gates applied for this patent, except the hard-metal plate at the end of the shaft. But the use of hard or steel-wearing plates was shown to be old, and several letters patent, viz., C. M. Savoye, an English patent, 1831; T. Varney, No. 63,675, issued April 9, 1867; Palen & Avery, No. 111,239, issued January 24, 1871, and several others were put in evidence by the defendants, and exhibited the feature of a hard-metal wearing plate at the end of the working shaft.

Our conclusion is that reached by the court below, and its decree dismissing the bill is

Affirmed.