

ble of extension and contraction, and to be folded up, is not seriously claimed, we take it, to possess the merit of a patentable novelty. We may aptly apply to the last two claims the language of Mr. Justice Clifford, in *Machine Co. v. Murphy*, 97 U. S. 125:

"Except where form is of the essence of the invention, it has but little weight in the decision of such an issue; the correct rule being that, in determining the question of infringement, the court or jury, as the case may be, are not to judge about similarities or differences by the names of things, but are to look at the machines or their several devices or elements in the light of what they do, or what office or function they perform, and how they perform it, and to find that one thing is substantially the same as another, if it performs substantially the same function in substantially the same way to obtain the same result, always bearing in mind that devices in a patented machine are different, in the sense of the patent law, when they perform different functions or in a different way, or produce substantially a different result."

That other mechanics and tanners should have testified to making the equivalent of such case prior to the grant of this patent, unaided save by their observation that the box was used by grocers and on street lamps, should arouse little incredulity. Our conclusion is that the patent in question is void for want of patentable novelty. The decree of the circuit court is therefore reversed, and the cause is remanded, with directions to dissolve the injunction and dismiss the bill, at the cost of complainants.

FRASER et al. v. GATES IRON WORKS.

(Circuit Court of Appeals, Seventh Circuit. March 3, 1893.)

No. 407.

1. PATENTS—ANTICIPATION.

A patent for a gyrating crusher shaft in a stone crusher having a tapering journal bearing may be anticipated by any similar bearing, whether found in a stone crusher or not, as journal bearings, wherever found, are within the scope of the art to which the patent pertains.

2. SAME—INVENTION.

A tapering shaft and cylindrical bearing being old in stone crushers, the desirability and practicability of producing a continuous line of contact in the bearing is obvious, and involves no invention.

3. SAME.

In a gyrating crusher shaft for a stone crusher, having a tapering journal moving in a cylindrical bearing, the making of the exact adjustment in the angle of gyration necessary to produce a single line of contact between the journal and the bearing requires mere mechanical skill.

4. SAME—STONE CRUSHERS.

The Gates patent, No. 259,681, for a gyrating crusher shaft for a stone crusher, having a tapering journal in combination with a journal bearing, is void because of anticipation and for want of invention.

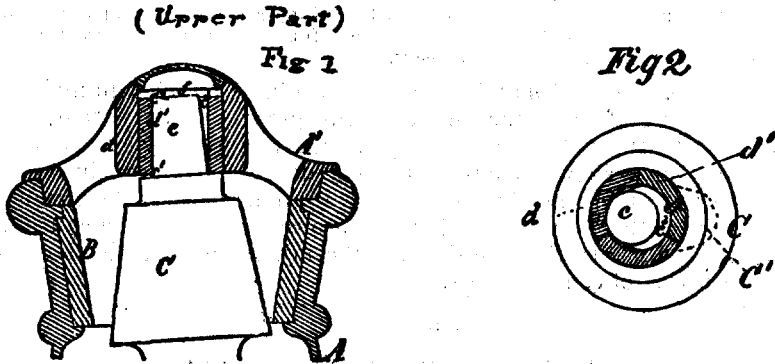
Appeal from the Circuit Court of the United States for the Northern Division of the Northern District of Illinois.

This appeal presents a question of the validity of the first claim of letters patent of the United States numbered 259,681, granted June 20, 1882, to Philetus W. Gates. The claim reads as follows:

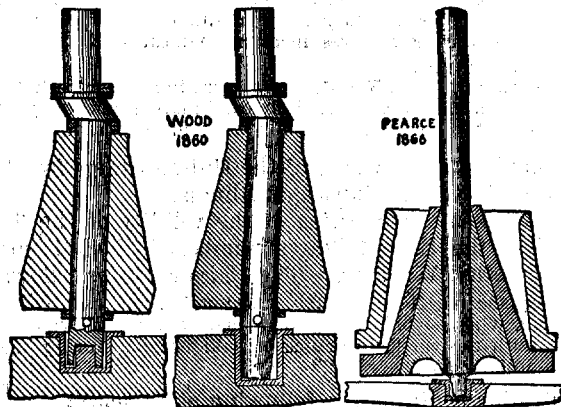
"A gyrating crusher shaft having the tapering journal, *c.* in combination with a journal bearing, whereby only a portion of said tapering journal stands parallel and in contact with the vertical surface of said bearing during the gyration of the shaft, substantially as described."

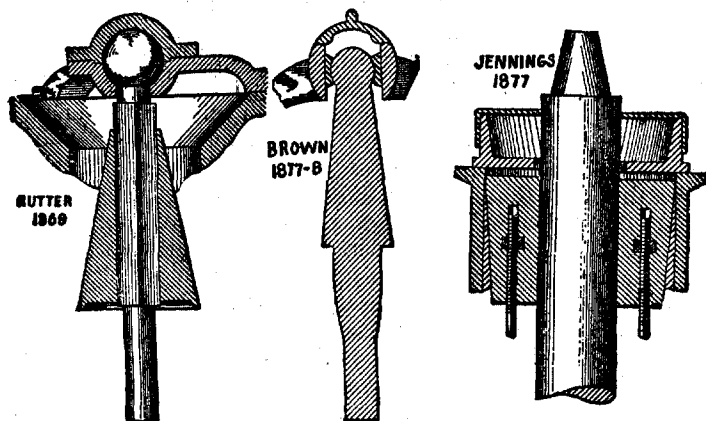
The specification contains the following statements:

"My invention relates specially to a shaft having a conical crusher head between its ends, and which has its lower end connected to a revolving eccentric, which gives the shaft and conical crusher head a revolving gyrating movement, while its upper end is fitted to move in a stationary journal bearing; and the object of my invention is to secure a continuous straight bearing during the action of the crusher head from the bottom to the top of the journal bearing along the working surface of the journal of the shaft, while the requisite accommodation for the gyratory movement of the shaft is afforded, and this object I attain by means hereinafter described, represented in the accompanying drawings, and claimed. * * * Any other form, combination, and arrangement of these well-known parts may be adopted in connection with my invention so long as the same produce a revolving gyratory motion of the conical crusher head."



The prior art in proof consists in part of letters patent of the United States, No. 9,914, to Dibben and Bollman, for multiplying gearing; No. 28,031, to G. H. Wood, for stone-crushing mill; No. 44,000, to Friedrich Klinkerman, for grinding mill; No. 56,793, to Henry Pearce, for quartz crusher; No. 63,675, to Thomas Varney, for quartz mill; No. 79,168, to Seth Wheeler, for universal joint; reissue No. 3,633, to James W. Rutter, for ore mill; No. 190,048, to Reuben T. Jennings, Sr., for mill bush; No. 201,643, to Charles N. Brown, for ore crusher and grinder. Chief reliance is placed by the appellant on the devices of Wood, Pearce, Rutter, Brown, and Jennings, of which the following illustrations have been furnished:





No question is made of the correctness of these drawings excepting those of the Wood and Pearce devices, in respect to which the brief for the appellant says:

"It will be understood that Wood and Pearce do not show details of their fixed or lower bearings. Wood describes his so that it can be reproduced in the two forms shown. Pearce does not describe his, but shows enough to enable a mechanic to make it; and as he says that the lower flange of his cone may be omitted so as to simply crush the ore without pulverizing it, his machine requires a resistance against lateral pressure, and a strength nearly, if not quite, equal to the Gates. For these reasons the substantial accuracy of the cuts cannot be seriously questioned."

For a general description of stone crushers and explanation of their modes of operation, and for an exposition of the art as it existed before the date of the patent in suit, reference is made to the opinion of the supreme court in *Iron Works v. Fraser*, 153 U. S. 332, 14 Sup. Ct. 883. For the opinion of the circuit court in this case, see 79 Fed. 75. The claim now in question was held to be without invention by the United States circuit court of appeals for the Fifth circuit in *Birmingham Cement & Mfg. Co. v. Gates Iron Works*, 41 U. S. App. 201, 24 C. C. A. 132, and 78 Fed. 350, referred to in the opinion below.

L. L. Bond, for appellants.

Edmund Wetmore and H. Gordon Strong, for appellee.

Before WOODS and JENKINS, Circuit Judges, and BUNN, District Judge.

WOODS, Circuit Judge, after making the foregoing statement, delivered the opinion of the court.

The opinion delivered below contains no recognition of a prior art in either straight or tapered journal bearings, but, proceeding entirely on the assumption or theory that "the structure which was in the art, and which that indicated in the patent was intended to supersede, was a ball and socket," is devoted to an explanation on geometrical principles of the differences in construction and in theoretical operation, when employed in gyrating stone crushers, between a ball and socket

bearing and the bearing of a tapering journal in a straight cylinder, or of a straight journal in a tapering cylinder, on a line parallel and in contact with the vertical surface of the bearing from the bottom to the top of the taper. In the case decided in the Fifth circuit the proof of the prior art was the same as that in this record, the additional evidence here having reference only to the supposed longer durability, greater output, and other like advantages of machines with the straight taper bearing over those having the ball and socket; and it was there held that the "whereby" clause "does not add anything to the claim, which must be taken and considered as for 'a gyrating crusher shaft, having a tapering journal, c, in combination with a journal bearing.'" That would seem to be the necessary construction of the claim, unless it may be allowable for any reason to substitute for "whereby" the words "so adjusted that"; but whether such a substitution could be deemed legitimate need not now be considered, and it is equally unnecessary to determine with accuracy to what extent the distinctions between the two kinds of bearings pointed out in the opinion below and elaborated in the argument here exist and are of practical importance. Some of the differences are clear enough, mathematically, and are perhaps practically important, but others are imaginary, or of no more than theoretical significance. For instance, it is not correct to say, as testified by an expert, that the resistance to pressure in a ball and socket bearing is limited "theoretically to a single point of contact." If the bearing of a ball were in a cylinder, as it might well be, the pressure would be so limited, and for that reason, doubtless, the wear upon a ball at the point of contact, and, in a less measure, the wear upon the surface of the cylinder would be more rapid at first, but the instant effect would be to produce a short line of contact parallel with the vertical surface of the cylinder, and, as the wearing progressed, that line would lengthen, and give to the ball, approximately, the form of a tapering journal; but when the bearing of the ball is in a closely fitting socket the pressure in any given direction must be of one-half of the superficial area of the ball against the corresponding half of the socket; and, if it be true—as the evidence shows it to be—that the ball and socket wear away more rapidly than the tapering journal and its bearing, it is chiefly because, in the ordinary form of construction, the socket in order to admit the ball into place must be composed of sections, and for that reason is subject to more rapid detrition. The patent in suit, however, is designed to include a combination of the tapering journal with a sectional as well as with an unbroken bearing, and consequently it is not material to the question of invention that one of the forms described has advantages over the other in respect to a feature which is common to the latter and the prior art. Besides, it is evident that the sectional feature of a ball and socket bearing is not indispensable. The socket need be only hemispherical, and when in that form it may be uncut. In the Rutter construction, for instance, if the lower half of the socket were removed, the bearing would still be adequate, or, if not, it would be lacking only in strength, which could be supplied by increasing the quantity of material in the part retained. Indeed, there is strong support in the evidence for the contention that the superiority of the Gates ma-

chine over prior stone crushers is due mainly to increased weight and strength, which of course are not elements of invention. The bearing of a ball head might be a straight or tapering cylinder, or of other conceivable forms which need not be composed of segmental sections.

It is manifestly true, as has been shown diagrammatically, that the horizontal resistance of the different points in the surface of a socket against corresponding points of the inclosed ball varies according to location, so that "at every point upon the socket, except those along its middle, there is an excess of contact pressure, varying in proportion to the distance of such point from the middle, requisite to produce a certain amount of horizontal resistance"; but, it being evident that the socket may be made strong enough to meet the actual resistance at every point of contact, and that the wearing produced by friction between the ball and its socket will tend to maintain contact between them at the greatest possible number of points, it is not perceived that the proposition is of more than theoretical import. Besides, it does not apply to the ball and socket alone, since, under the law of the lever, there is an obvious and necessary inequality of pressure at the various points of contact along the line of the taper bearing.

Again, it is not true, as asserted by counsel, that it is "one of the distinguishing features of the tapered mounting that it is, of necessity, completely and geometrically adapted and fixed for some one given degree of gyration." Of course, there cannot be contact between a tapering journal and its bearing from the bottom to the top of the taper except on a particular degree of gyration, and any maladjustment of the angle would result in primary contact of the journal only with the lower or with the upper edge of the bearing; but, on that supposition, the instant friction has commenced, a line contact like that of the patent must begin to form, and with the continued effect of friction the line of contact must increase in length gradually, but with less rapidity as it becomes longer; and there is consequently no ground for the expressed belief of counsel "that the mounting would be utterly impractical without the line contact." Moreover, it is easy to see that instead of a vertical cylinder an efficient bearing for a tapering journal might be found in a cap piece with a circular opening presenting a convex surface for contact with the journal; and in such a bearing the journal itself, instead of being tapered, might be either straight, or flaring or convex. That the tapered mounting is adapted to resist pressure only in the single direction opposite the gyrated position of the shaft is true only when the contact is on a line extending from the bottom to the top of the taper; and while it is evident that the tapered journal can be moved downward, and, if suitably constructed, upward, in its bearing, it is obvious that a ball head, though not capable of vertical movement with respect to its inclosing socket, may, with its shaft, be made movable vertically by mounting the socket in a cap or head piece capable of vertical adjustment, which, it hardly need be said, could be done consistently with the requisite strength and firmness of parts, since the chief strain upon the journal and its bearing is in lateral, and not in vertical, lines. That the ball and socket mounting need not be made in sections has already been pointed out, and in one so constructed, according to any of the forms suggested, a remov-

able lining might be used, which, like the lining for the taper bearing of the patent, could readily be lifted out, and a new one inserted in its place, without unbolting and lifting off the whole upper portion of the machine, for which, it is said, a chain and tackle and derrick would be needed.

The angle of the straight line of a tapered journal with the axis of the shaft, and the superficial lines of a sphere or hemisphere, or of a ball and socket, varying as they do with changing spherical diameters, may be multiplied indefinitely, and so the other conical sections, between the straight line and the circle, the hyperbola, the parabola, and the ellipse, afford an infinite variety of curves, each mathematically different from the other, in conformity to which, theoretically at least, bearings resembling those found in the art might be constructed. The practical impossibility of producing bearings with differences so infinitesimal, though still capable of clear mathematical statement, is manifest, but in that fact is a refutation of the argument pressed upon us at the hearing and reproduced in print, drawn from mathematical distinctions not shown to be of more than theoretical significance. In *Caverly's Admr. v. Deere & Co.*, 24 U. S. App. 617, 13 C. C. A. 452, and 66 Fed. 305, where the patentability of a machine with knives set at a particular angle was in question, it was said that:

"It is, of course, true that certain geometrical propositions are applicable to knives in such a machine standing at an angle of 45 degrees which would not be applicable if the angle were different, and, conversely, if the angle were different, the geometrical propositions incident thereto would not be applicable to knives inclined at the first named angle; but patentability does not follow in the one instance more than in the other."

See, also, *Western Electric Co. v. Standard Electric Co.*, 84 Fed. 654.

A practical and proper view of the case, as we see it, admits of but one conclusion. In mechanics, the tapering journal and bearing are as old as the first hub which was shaped to receive a tapering axle, and since, practically, an axle cannot be quite as large as the opening in the hub the contact between the two must be, theoretically, on a line continuous from one end to the other of the opening of the hub, if the taper of the hub and axle both be made continuous and uniform. The pressure will, of course, be on the underside of the axle, except that when the vehicle is in motion up and down hill, or over uneven surfaces, the line of contact may be pulled forward or pushed backward some degrees; but, notwithstanding these and other differences which might be suggested, the fact remains that in a hub and axle is a complete illustration of a tapering journal in combination with a suitable bearing. Other familiar illustrations might be suggested, but it is not necessary to go beyond the proofs in the record. The tapering journal of the Jennings device, though unaccompanied with a cut or description of its bearing, necessarily implies, and would suggest to the mind of the mechanic, a suitable bearing, consisting of an opening in a cap or headpiece, either cylindrical or cone-shaped, or with curved sides, and there could be no invention in selecting one or another known form of opening. That that device is not a stone crusher, or that its shaft or spindle does not gyrate, is not important, since journal bearings, wherever found, are in the art to which this patent pertains, and are

necessarily to be considered in determining its scope or validity. If, however, the investigation were limited to the bearings shown in the earlier stone crushers which have gyrating shafts, the anticipation is not less complete. It is no objection to the significance of the Pearce or Wood machine that the gyrating end is uppermost and the journal bearing below; and whatever doubt, in view of the conflicting testimony of the experts, there may be concerning the bearings in the machines of Pearce, Varney, Klinkerman, and others, the drawings and specification of the Wood machine, concerning which the experts have not spoken, necessarily imply a tapering journal substantially like that in question. It is true, the drawings do not disclose the exact form of the lower end of the shaft, but the specification says that the bottom of the structure on the inside, is furnished "with a hole or pin (d) in the center, on which or through which is stepped the bottom of the shaft," and, the shaft being a gyrating one, the bearing, as any competent mechanic could not fail to see, must be a hole into which the end of the shaft should fit, or a pin which should fit into a hole in the end of the shaft, with such freedom in either case as not to interfere with gyration. Even if there were no evidence of such bearings in the prior art, the form of the claim, which is for a combination, is equivalent to an admission of their existence, and that admission is emphasized by the proof contained in the file wrapper, the substance of which is stated in the opinion of the court in the Fifth circuit, and need not be rehearsed here. We find in the patent nothing which is not clearly in the prior art except the requirement, which, to say the least, is not clearly covered by the claim, that only a portion of the tapering journal shall stand parallel and in contact with the vertical surface of the bearing from the bottom to the top of the taper during the gyration of the shaft. But, the tapering shaft and cylindrical bearing being old in fact, as well as by implied admission, the desirability and practicability of producing the continuous line of contact in the bearing were alike obvious, and cannot be deemed to have involved invention. Between a tapering journal and a cylindrical bearing more than a single line of contact is impossible, and when the shaft is a gyrating one such contact can be produced only by a particular and exact adjustment, relatively, of the degree of taper in the journal and the angle of gyration. To effect that adjustment, it is evident, could never have required more than mechanical skill. Whatever may have been the reasons for the use of the ball and socket bearing in the earlier stone crushers with gyrating shafts, it is manifest that the straight and tapering forms of bearings are the more simple, and therefore were probably first in use, and that the change in stone crushers from the ball head to the tapered cone was a return from the complex to the simpler form. The decree in so far as it declares the claim in question valid, and to have been infringed, is reversed, and the cause remanded, with direction that the bill be dismissed.

BANNERMAN v. SANFORD.

(Circuit Court, S. D. New York. June 5, 1897.)

1. PATENTS—ANTICIPATION.

A patent cannot operate as an anticipation of a later patent when it is shown that the invention of the latter was perfected prior to the issuance of the former.

2. SAME—INVENTION.

Merely changing the connection of the hand piece in a magazine firearm from a swinging to a piston breech is merely putting the hand piece and means of connection to a new use in the same place, and is not patentable there separately from the parts connected with.

3. SAME—MAGAZINE FIREARMS.

The Roper patent, No. 316,401, for a magazine firearm having an actuating hand piece beneath the barrel, and connected with a piston breech for removing exploded shells, and inserting cartridges, without taking the gun from the shoulder, held invalid, because of prior use.

This was a suit in equity by Francis Bannerman against Philip G. Sanford for alleged infringement of a patent.

Charles G. Coe, for plaintiff.

Charles R. Ingersoll and George D. Seymour, for defendant.

WHEELER, District Judge. This suit hangs upon patent No. 316,401, dated April 1, 1885, and granted to Sylvester H. Roper, for a magazine firearm, having an actuating hand piece beneath the barrel, and connected with a piston breech, for removing exploded shells, and inserting cartridges, without taking the gun from the shoulder. The claims in question are:

(1) In a magazine firearm, a piston breech suitably connected to and in combination with an actuating sliding handle situated forward of the receiver, and serving as a means for supporting the barrel, and provided with a path of reciprocation in a line parallel with the axial line of the barrel.

(2) In a magazine firearm, the combination of a piston breech, a supporting handle forward of the receiver, and movable in the direction of the length of the barrel, means connecting the handle and piston breech, and means whereby the piston breech will be held in position during firing, substantially as specified.

(3) In a magazine firearm, the combination of a piston breech, a supporting handle forward of the receiver, and means connecting the piston breech and supporting handle, so that, when the supporting handle is used, the piston breech will be moved in the same direction, substantially as specified.

(4) In a magazine firearm, the combination of a piston breech, a supporting handle forward of the receiver movable in the direction of the length of the barrel, and means whereby, when the said supporting handle is moved back and forth, motion will be transmitted to the piston breech, so as to cause the latter to move back and forth, substantially as specified.

(5) In a magazine firearm, the combination, with a barrel and a tubular magazine, of a piston breech, a device whereby the passage of a cartridge from a point opposite the magazine to a point opposite the barrel will be effected, and a supporting handle forward of the receiver adapted to move in the direction of the length of the barrel to operate the piston breech, and to operate the device whereby the passage of a cartridge from the magazine to a point opposite the barrel is effected, substantially as specified.

(8) In a magazine firearm, the combination, with a barrel and magazine, of a piston breech, a supporting handle situated forward of the receiver, for reciprocating the piston breech in the direction of the length of the barrel, and a device operated by the piston breech, and serving to cause the passage of a cartridge from a point opposite the magazine to a point opposite the barrel, substantially as specified.