bodying the device covered by the first claim. It never went into commercial use.

Upon the question of infringement the complainant must, in order to obtain the summary relief demanded, satisfy the court beyond a reasonable doubt.

The claim covers "a female member made in two parts" and it is conceded that if the claim be strictly construed and limited to two parts, the defendant does not infringe, for the reason that more than two parts are actually assembled in the construction of its button-hole member.

That the claim is susceptible of the construction contended for by the defendant cannot be denied. It is enough for the present motion that the court entertains doubt as to the propriety of the complainant's contention. For manifest reasons the court should not at this stage of the litigation extend the discussion beyond the point necessary for the decision of the motion in hand.

The motion must be denied.

BUNDY MFG. CO. v. DETROIT TIME-REGISTER CO.

(Circuit Court of Appeals, Sixth Circuit. May 2, 1899.)

No. 604.

1. PATENTS—INFRINGEMENT—JOINDER OF ELEMENTS.
   One may not escape infringement by the mere joinder of two elements into one integral part, if the united part effects the same results, in substantially the same way, as the separate parts before the union.

2. SAME—MECHANICAL EQUIVALENTS—WORKMEN'S TIME RECORDERS.
   In a workman's time recorder, the mere substitution, for a turning key having the workman's number on its ward, of a pushing key having such number upon a fin, the function of each being to set in motion mechanism which operate the impression devices, is but the use of a mechanical equivalent.

3. SAME.
   A patent for a workman's time recorder, in which the printing is done by pressing a recording strip against the type by a blow from an impression hammer, is infringed by a mechanism in which the type is pressed upon the recording strip by pressure only. The two methods are mere mechanical equivalents.

4. SAME—CONSTRUCTION OF PATENT.
   To be entitled to the benefit of the doctrine of equivalents, it is not essential that the patent shall be for a pioneer invention in the broad sense of that term. If the invention is one which marks a decided step in the art, and has proved of value to the public, the patentee will be entitled to the benefit of the rule of equivalents, though not in so liberal a degree as if his invention were of a primary character.

5. SAME—MERITORIOUSNESS OF INVENTION.
   The meritoriousness of an improvement depends—First, upon the extent to which the former art taught or suggested the step taken; and, second, upon the advance made in the usefulness of the machine as improved.

6. SAME—ESTOPPEL BY ACCEPTING ACTION OF PATENT OFFICE.
   To be estopped by the action of the patent office, the patentee must be shown to have surrendered something which he now claims in order to obtain that which was allowed.

7. SAME—WORKMEN'S TIME RECORDERS.
The Bundy patent, No. 452,894, for a workman's time recorder, construed, and *held* infringed as to claims 3 and 4 by the time recorder of the Watson patent, No. 515,805.

8. SAME.
The Bauer patent, No. 305,882, for a watchman's time detector, construed, limited, and *held* not infringed as to claim 4 by the time recorder of the Watson Patent, No. 515,805.

Appeal from the Circuit Court of the United States for the Eastern District of Michigan.

Alan D. Kenyon and Wm. Houston Kenyon, for appellant.
James Whittemore, for appellee.

Before TAFT and LURTON, Circuit Judges, and CLARK, District Judge.

LURTON, Circuit Judge. This is a bill to restrain infringement of the third and fourth claims of patent No. 452,894, of May 26, 1891, to W. L. Bundy, for a workman's time recorder; and also the fourth claim of patent No. 305,882, of September 30, 1884, to W. Bauer, for a watchman's time detector. The defendant is a corporation known as the Detroit Time-Register Company, and is engaged in making and selling a workman's time recorder, under a patent to N. M. Watson, No. 515,805, of March 6, 1894. Bundy's invention relates to time-recording mechanism actuated directly by a clock, and connections with a clock, by which the time of the arrival or departure of workmen, clerks, or other employés may be recorded by the employés themselves. His specifications state that his object is "to provide a mechanism by which each workman or employé in a shop or factory, or the like, will, by his own act, accurately record the time of his arrival or departure, thereby preventing all disputes, each workman having his own key, and being known by an arbitrary number, which is embossed upon the bit of the key, and, upon its being inserted and turned, will present the embossed number in alignment with the numbers upon the hour and minute recording wheels, and through the agency of a hammer and pad thereon, actuated by the key, and a ribbon and strip of paper in proper juxtaposition the hour, minute, and the number of the key will be printed upon the paper, and a feed mechanism will shift the paper and ribbon a fixed space, ready for the operation of the printing mechanism by the next workman and the recording of his time and the number of his key, as before. Then the 'time' of each workman is made up from the paper strip, crediting each one with the time between his arrival and departure, whether it be full time or only a part thereof." The claims which are here involved are as follows:

"(3) A clock movement and hour and minute recording wheels, synchronous mechanism actuating said wheels, a key provided with a bit carrying numbers, brought into alignment with the hour and minute wheels by the turning of the key, a recording strip, and an impression hammer, in combination as set forth. (4) A clock movement, hour and minute recording wheels, synchronous mechanism actuating said wheels, a key provided with a bit carrying numbers brought into alignment with the hour and minute wheels by turning of the key,

a ward upon the key, a recording strip, and an impression hammer operated by mechanism actuated by the ward of said key as it is turned, in combination as set forth."

The patentee does not claim any novelty in any of the parts or elements of his combination. The claims involved are distinctly for the union or combination of all the elements arranged and combined together so as to accomplish a given result, in the manner described. Neither does the complainant insist that the structure of the defendant includes the precise mechanism described in the specifications of his patent, nor that the elements combined to produce the results attained are identically the elements described in the patent to Bundy. What is claimed is this: That both the elements and actuating mechanism found in the structure of the defendant are mechanical equivalents for those found in the Bundy machine, and that they are combined in substantially the same way, so that the mechanical equivalent for each element performs substantially the same function of the corresponding element in the complainant's machine; and that the differences between the elements combined in the two machines, and in the mode of arrangement, are merely colorable according to the rule forbidding the use of known equivalents.

The learned judge who decided this case in the circuit court, after an elaborate consideration of the claims of the Bundy patent in the light of the history of the art and of the occurrences in the patent office, reached the conclusion that the Bundy patent was not entitled to a liberal construction, nor to the benefit of the doctrine of equivalents, but was limited to the specific device described and claimed by him, and that, thus construed, the defendant's structure did not infringe. In this interpretation of Bundy's invention we are unable to agree. Our inability to agree with the conclusions of the circuit court results from the view we take of the meritoriousness of Bundy's combination in producing a simple and accurate time recorder, capable of being used by a very large number of workmen in rapid succession, and without danger of confusion or error. The results attained by him were such as to distinctly mark the line between success and failure, and the rapid occupation of the field by his invention serves as evidence that the public for the first time realized that in his time recorder had been found a practical structure, which accomplished accurately and simply what no previous invention would do. It is manifest from the conditions under which such a mechanism must be operated, as well as from the results sought by its use, that to be efficient it must be capable of correctly recording in rapid succession, not only the time of arrival or departure, but some number or mark by which each of an indefinite number of employés may be distinguished from all of his associates in connection with the record of his time. But this record must be one which can be automatically made by the machine when set in motion by the workman. This condition makes it of the highest importance to the usefulness of the recorder that the act to be done by the workman shall be single and simple, so simple that employés of every grade of intelligence shall be capable of operating the machine without liability of mistake

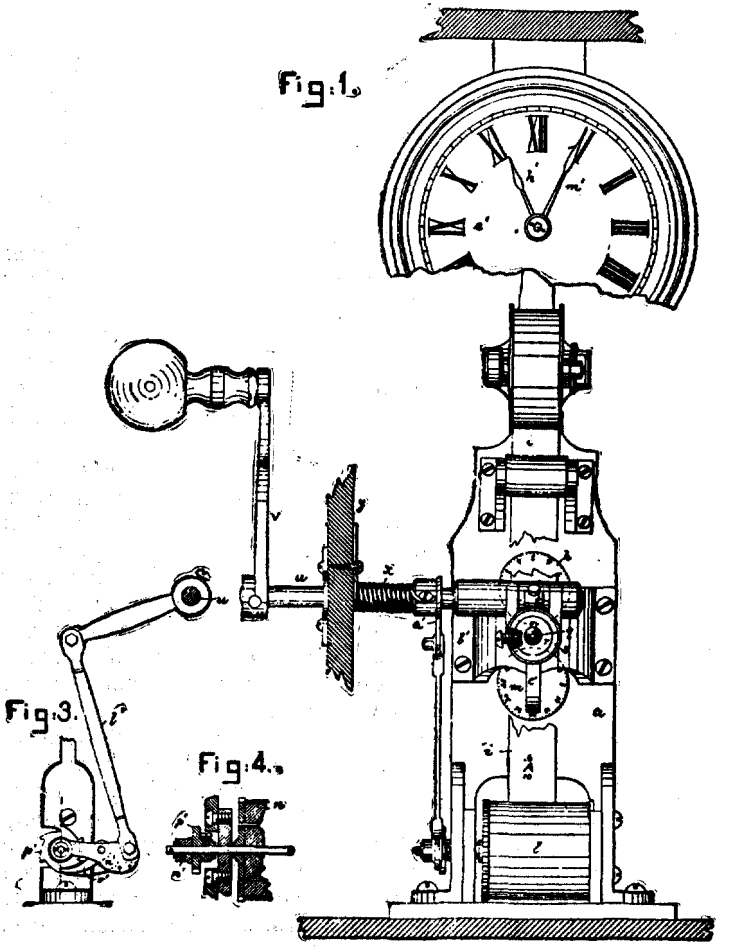
in the record or injury to the machine. This was the problem which required solution in order to produce a practical time recorder, and this problem is fully met in the invention of Bundy. But it is said that, if the claims of his patent are so broadly construed as to give him the benefit of a liberal application of the rule of equivalents, it will be found that he was anticipated; and for the purpose of limiting Bundy to the precise structure described by him the defendants have gone very deeply into the so-called "history of the art." For this purpose a series of patents for watchman's clocks have been introduced, including the following: J. E. Buerk, August 25, 1865; Anton Myers, No. 117,442, of 1871; L. Aldridge, of 1875; W. Imhauser, of 1876; and W. Bauer, No. 305,882. The general nature of the machines represented by the patents referred to, and their uses is fully discussed and explained in Imhauser v. Buerk, 101 U.S. 647. The learned counsel for defendant, in his brief, thus describes these clocks, and the limitation upon their usefulness, by saying:

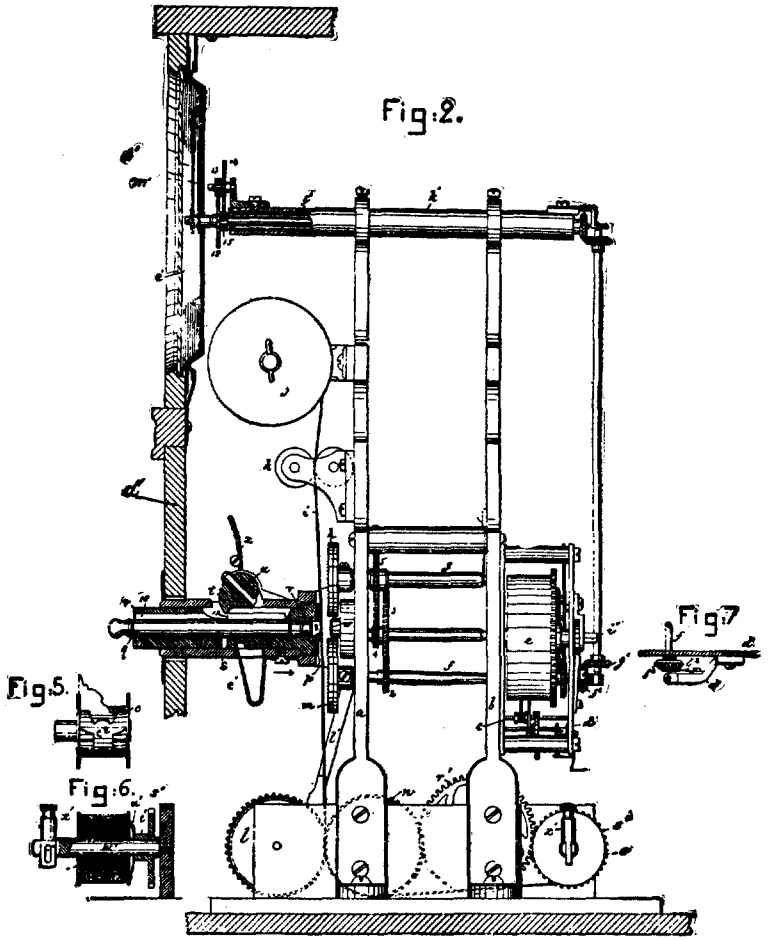
"In all these watchman clocks, however, the recording strip was moved by the clock, and was synchronized therewith, so that they were not adapted to be used by a large number of watchmen in quick succession, because if so used, they would print in the same place; but were rather intended for use by one or a few watchmen at different intervals of time. In other words, there was no paper feed after each operation."

It is true that in a patent to B. Bocklin, No. 199,181, for a tell-tale clock, there is found a feeding device by which the recording strip is fed forward with each operation. But Bocklin's invention, though embodying hour and minute recording wheels, synchronized with a clock, and a recording strip carried forward with each operation of the machine, was in fact intended only for use by watchmen who might record thereon the time of call at the station. There was no way by which the machine could be used by more than a very few watchmen, because no means for identifying a large number of employés was included in the invention. The problem was a distinct one. A watchman's clock, to be used by one or two or three watchmen, or possibly as high as seven, was well known. But such machines were not adapted for use as time recorders for an indefinite number of records made in quick succession. The evolution of a practical workman's time recorder out of the improved watchman's clock of either Bauer or Bocklin required the discovery and application of mechanism by means of which each of an indefinite number of employes of varying degrees of intelligence and care might, by a single and simple act, identify himself in association with a record of the exact time of doing that act. This involved invention. This is just what Bundy was the first to do, in a way which met all the conditions requisite to a time recorder which should rapidly, accurately, and without danger of mistake keep the time for a great number of men, who might arrive or depart in quick succession. A number of others sought to accomplish this end before Bundy made the invention now involved. Those which are regarded as the closest anticipations are the patents of Lane & Hill, No. 210,788, dated December,

1878; C. S. Haskell, No. 319,092, dated June 2, 1865; W. L. Bundy, No. 393,205, dated November, 1888; and of A. Dey, No. 411,586, dated September 24, 1889. The patent in suit to W. L. Bundy follows all of these, and is dated May 26, 1891. That which is the closest approximation to Bundy's patent is also the first in time of those mentioned, being the patent to Lane & Hill. This structure is shown in Figs. 1 to 7, inclusive, set out below.

It contains, like all patents for time recorders, a clock movement, hour and minute recording wheels, h and m, synchronous mechanism for actuating these wheels, a movable recording strip, i, and impression mechanism for pressing type on the recording wheels, h and m, and upon the end of the so-called "key," q, against the recording strip which runs between the type upon the registering time wheels, and the type recording the workman's number carried





on the end of the key, q. No inking ribbon is used, the record being embossed. The so-called "key," q, is not a key in any true sense, inasmuch as it does not set in motion or actuate any mechanism whatever. It is properly an elongated type, the type being carried on its inner head, 8. The type carried in this way represents the number distinguishing the workman carrying and using the particular key. This key is inserted in a slot in the plunger, r, in a sleeve, s, as shown in Fig. 2. The fin, 10, shown on the key in Fig. 2, performs no function in operating the mechanism, and serves only to keep the key in an upright position. This machine is operated by inserting the key, 9, in the plunger, r, and then grasping and turning the handle, v, shown in Fig. 1. The fin, 10, is notched, as shown by 11 in Fig. 2, "as is also the shank of the plunger, r, to permit the cam, t, or an arm or toe on the shaft, u,

when turned by the workman seizing the handle, v, to descend into an opening in the sleeve, s, and act against the shoulders of the key and of the plunger, force the key, plunger, and pad forward, and press the strip, i, against the registers, h, m, and emboss or imprint upon the strip the hour and minute of the day at which the movement took place. The head, 8, acts against the bed, w, placed opposite it, behind the strip, so that with each record of hours and minutes there also appears a letter, character or number to designate a person." This embossing, it will be noticed, occurs on both sides of the recording strip; that is, the number carried on the workman's key is embossed on one side, while the figures representing time are embossed upon the opposite side. This invention was never put into practical use, none being ever sold or made for purposes of sale. The mechanism of the Lane & Hill device is put in motion, not by the operation of any key, but by the handle, v. The key is merely an elongated type, and performs no function except to carry into proper position the type on its end, and to act in conjunction with the plunger into which it is inserted as a part of the impression mechanism by which the embossing is done. The handle, v, actuates the mechanism for feeding forward the recording strip as well as the impression mechanism by which the printing is done. The defect in this device as a practical workman's time recorder is that its operation requires two entirely distinct acts to be done by the workman: First, he must insert the key in the slot of the plunger far enough for the cam, t, to engage the notch, 11; and, second, he must grasp and turn the handle, v, with the requisite force to press the plunger forward and do the work of embossing. The necessity for doing two distinct things is in itself most objectionable in a device of this kind. The mechanism was liable to injury if the key is not inserted far enough to enable the cam to engage the key in its notch, and was liable to become jammed in the plunger. Excessive force, altogether likely when men are crowding and indifferent, applied to the crank handle, is likely to result in injury to the crank by loosening or detaching the handle from the shaft. All of these defects are pointed out by experts, in addition to the fact that the operation of the machine is necessarily much slower than that of one requiring only one simple act by the operator. This invention was never put into practical use, none having ever been made for the market.

The Haskell patent is wholly unlike the Bundy in material respects. Haskell attempted to solve the problem of identifying the workmen by requiring them to write their names or numbers upon the paper strip and then to print the time by revolving a handle. The Bundy patent of 1888 undertook to accomplish the desired result by placing numbers representing the different employés upon wheels called "operators' wheels" within the casing of the clock. The workman's number is brought into alignment with the type upon the time-recording wheels by lugs upon the key of different shapes and lengths, operating through a complicated and delicate mechanism to move the

operator's type wheel. The intricacy and delicacy of the mechanism necessary to bring the particular number desired into alignment was such as to make the machine unreliable, and of no practical value whatever. It was but a toy machine, and was worthless for actual use. The Dey machine was another which placed the workman's number upon an operator's type wheel inside the machine. These wheels were connected with indicators on certain index plates on the face of the recorder. The workman was first required to turn the indicator opposite to the desired number on the index plate, which brought the corresponding number on the operator's type wheel into alignment with the type-recording wheels. Then the workman is required to pull down a lever which sets in motion the mechanism which does the printing, and feeds forward the strip and inking ribbon. This constituted the state of the art when Bundy made the invention covered by his patent of 1891. There was no practical operative machine which fully met the conditions incident to the successful use of such a recorder, where both simplicity and accuracy were essentials to usefulness.

The Bundy time recorder is a structure which automatically records upon a movable recording strip the time of the arrival and departure of employés, and, opposite the time, records the individual mark or number distinguishing the different workmen, so that the precise time of the arrival of each workman is distinctly recorded. Each workman is furnished with a key, upon a bit or ward of which is a number in type, by which the particular workman is distinguished. The record is made by the simple operation of inserting and turning the key. The recording strip of the claims is a movable strip fed forward with each turning of the key, and with this strip the inking ribbon is also carried. The single and simple operation of turning the key not only brings the type printing the workman's number into alignment with the type on the time recording wheels, but by the same operation the ward of the key sets in motion mechanism within the machine by which the recording strip and inking ribbon are fed forward, and also actuates suitable impression mechanism by which the type carried on another ward of the key for printing the workman's number and the type upon the time-recording wheels for printing the time indicated by the clock, are brought into contact with the inking ribbon and recording strip and a printed record made. The very essence of this invention lies in Bundy's key and its functions, for by the simple and easy operation of that key the work of aligning, printing, and feeding is done. This structure is sufficiently illustrated by Figs. 1, 3, 4, 5, 10, 11, and 12 of the drawings of the patent, which are set out on following pages.

Fig. 1 is a front elevation of a clock, having its front broken away to show the recording mechanism. Fig. 3 is a side elevation of the recording mechanism, showing the impression hammer and helve in partly dotted lines. Fig. 4 is a top plan of the hour and minute recording wheels, 10 and 11, the mechanism for actuating them, inserted and turned into position in alignment with these wheels, ready for the making of the impression, as shown in Fig. 3. Fig. 7

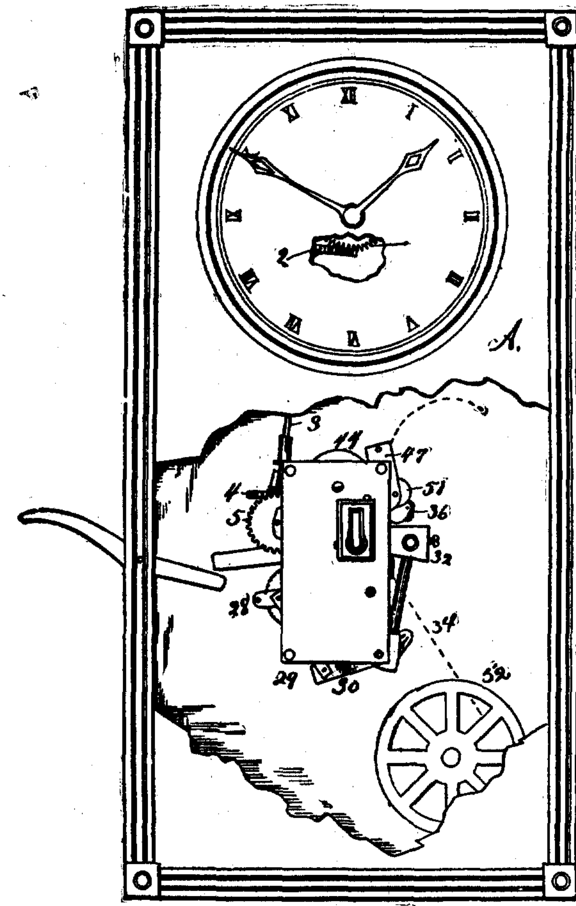


Fig. 1

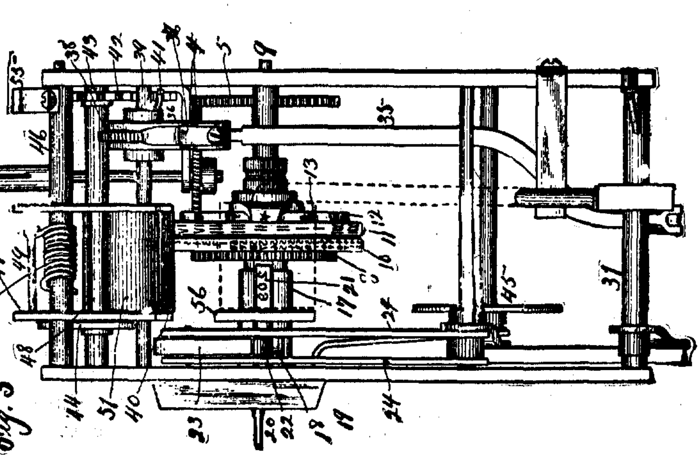


Fig. 3

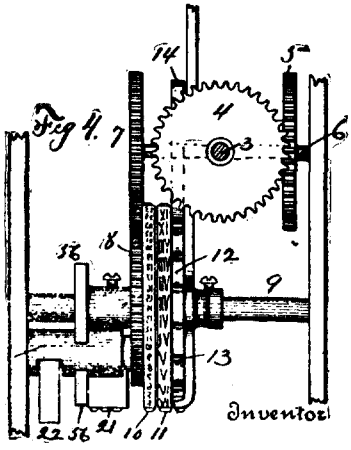


Fig 4.
Inventor

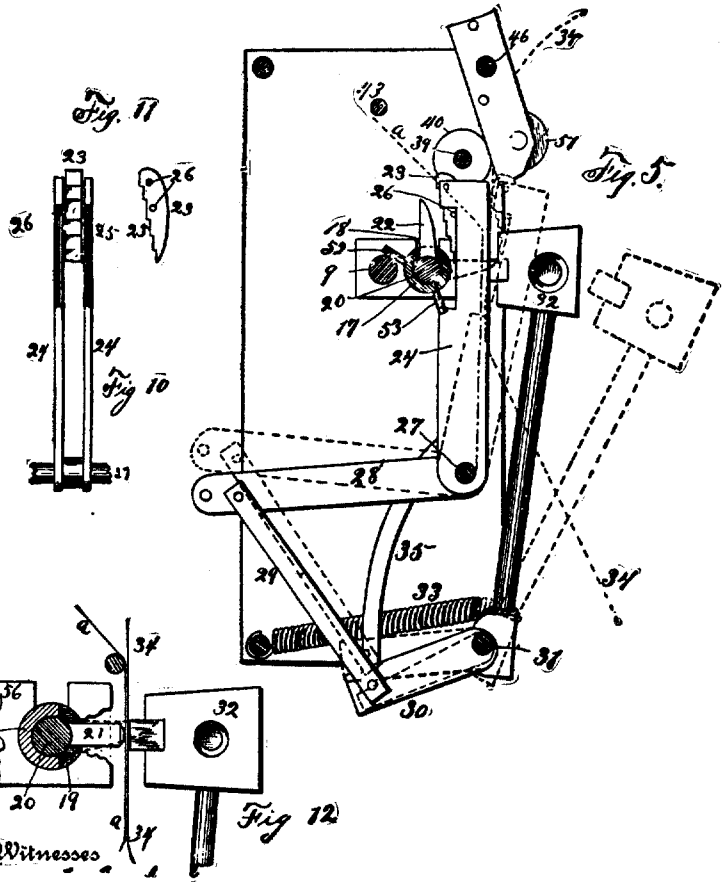


Fig. 11
Fig 10
Fig. 5.
Witnesses
Fig 12

is a side elevation of Bundy's key, showing an arbitrary number on the so-called "bit," 21. Fig. 5 is a sectional elevation of the recording mechanism, the front being removed, and the hour and minute wheels and the means for actuating them being also left off, and showing in dotted lines the position assumed by the hammer and helve, and their operating mechanism, when a key is turned, and just at the instant when the hammer is about to be released by a slight, further movement of the key. Fig. 10 is a front elevation of the key locking pawl, the parallel bars supporting it, and the shaft to which said bars are secured. Fig. 11 is a side elevation of the pawl detached. Fig. 12 shows the key turned in the key holder, and the hammer in the act of making an impression.

Defendant's mechanism, like that of complainant's, consists of two parts,—a large clock case, containing clock works, and a smaller machine within the clock case. Three drawings found below represent correctly the mechanism involved in the time recording apparatus carried within the clock frame, and show all the material parts of the machine, except the clock movement. These drawings are as follows:

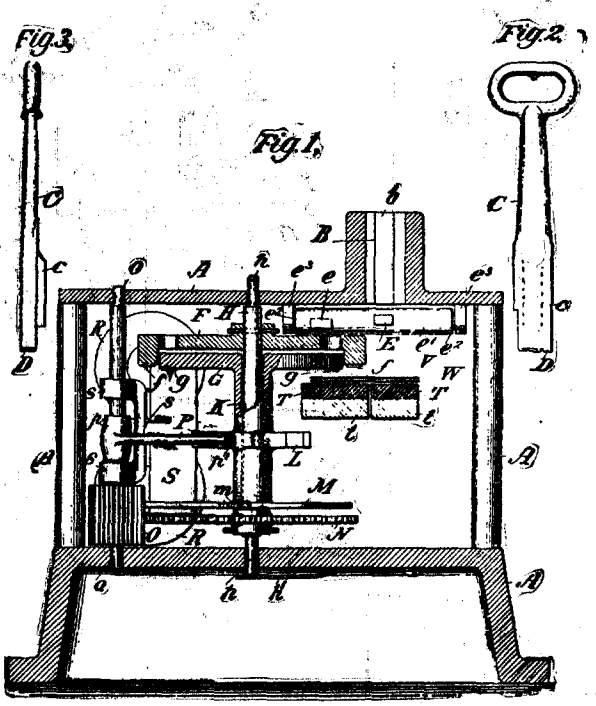


Fig 4.

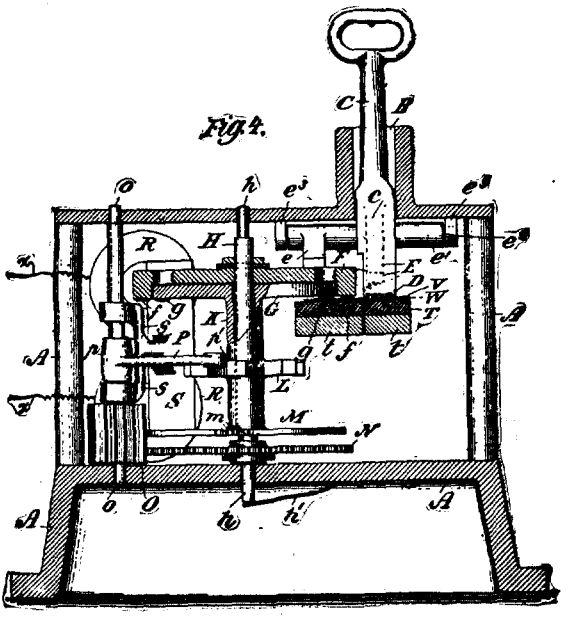
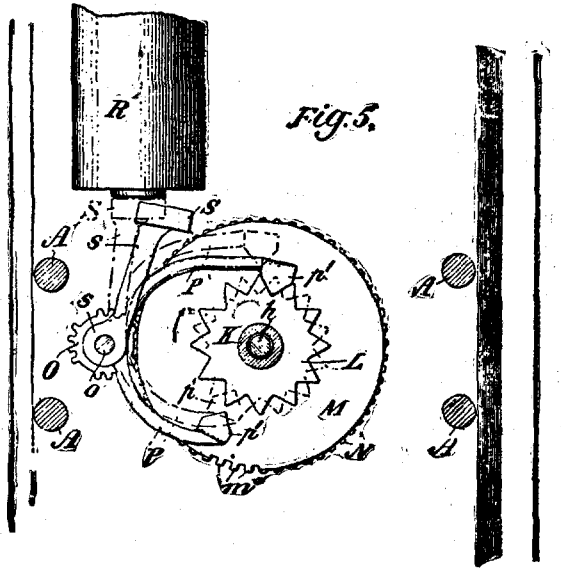


Fig. 5.



The following are the material parts shown by these drawings: First. Hour and minute recording wheels, F and G, with type upon their peripheries representing the hours and minutes. Second. Synchronous mechanism between the clock movement, not shown, and the time-recording wheels, F and G, by which these wheels are actuated. Third. A recording strip, V, and an inking ribbon, W, which are fed forward by operation of the key each time it is inserted and pushed. Fourth. An impression mechanism consisting of the key, C, the arms, E, e, rocking bar, é, wheels, F and G, and the printing cushions, T, t. Fifth. The key, C, carrying the workman's number on its end, and having a fin or projection, c, on one side, as shown in Fig. 2. This key is inserted in keyhole, B, and is then pushed inward as far as it will go. This inward thrust of the key brings the workman's number on the key into alignment with the type upon the recording wheels, F and G. The same inward thrust causes the fin or ward, C, to strike arm, E, of rocking bar, e′, and depresses it. Arm, e, being fixedly secured to rocking bar, e′, is also depressed. In its downward course, arm, e, strikes against hour wheel, F, forcing it and the minute recording wheel, G, downward. The downward pressure upon the type-recording wheels being simultaneous with the thrust of the key, the workman's number and the type upon the time wheels are simultaneously pressed against the recording strip and inking ribbon and printing cushions, T, t, and effect the printing by force of the inward thrust given the key by the operator. The printing of the workman's number is done independently of the mechanism by which the type on the time wheels are made to print. The stem of the key, when pushed in, passes by the rim of the outer wheel until it strikes with its end against the recording strip and inking ribbon on the printing table or cushion, T. Were it not for the engagement by the projecting fin or ward of the key with the arm, E, the workman's number would alone be embossed or printed. The function of the fin, e, is, through connecting mechanism, to carry down the wheels, F and G, endwise, and press them against the same cushion simultaneously with the number on the end of the key. "Thus the key," says Mr. Barthel, the expert for defendant, "in defendant's machine not only makes the imprint of its own number by the pressure of the hand, but it also presses the hour and minute wheels against the recording strip and printing table to produce a record of the time in connection with that of the key." The pressure upon the key by the hand of the operator is, however, applied to the time-recording wheels only through the rock shaft and arms, E, e, for the key does not come into direct contact with those wheels. The hammer-like force of the inward thrust of the key is transmitted to the recording wheels by the interposition of the rock shaft and its arms, with which the fin or ward of the key engages as it is thrust inward. But the defendant contends that, although its structure greatly resembles that of the complainant, yet they do not infringe, for the following reasons: (1) Because defendant does not use a turning key; (2) defendant does not use a key which carries a number on its bit; (3) defendant does not use an impression hammer.

It is true that defendant does not use a turning key. It has sub-

stituted for a turning key one which, instead of turning, performs the same functions by an inward thrust. The so-called "fin" is the equivalent of the ward upon Bundy's key. It does the same work by a thrust, which, in Bundy's machine, is done by turning. The ward or projection in each engages with other mechanism, and transmits motion or sets other mechanism in motion. The defendant's key carries the workman's number upon the end of its stem, instead of upon a projecting piece of metal upon the side of its stem. The so-called "bit" of the complainant serves no other purpose than to carry the number so that, when the key is operated, the number will be in alignment with the time-recording wheels. The "bit" does not set in motion any other mechanism, and performs no function that is not performed by the end of the stem of defendant's key. The most insistent contention of the defendant is that it does not use the "impression hammer" of the Bundy patent. The fourth claim of the Bundy patent includes as an element "an impression hammer, operated by mechanism actuated by the ward of said key as it is turned." The contention is that Bundy is limited to an impression hammer operated by mechanism set in motion by the ward of a turning key, and that it is open to another to substitute for an impression hammer a different impression mechanism, and that it (the defendant) neither uses a hammer nor is its impression mechanism operated by mechanism actuated by the ward of a key "as it is turned." The difference between the two methods of printing is only this: First. Bundy prints by pressing his recording strip against the type, while defendant prints by pressing the type down upon the recording strip. That the printing is done by a blow delivered by Bundy's "hammer," and by pressure only in the device of defendant, is not material. Both methods of printing were well known, and one is the full equivalent of the other. The difference between the two methods is at last but of degree in force used. Both produce the contact necessary to make an impression. Second. The mechanism which operates the impression mechanism in Bundy's device is set in motion by a fin, ward, or projection of a key as it is thrust inward by the hand of the operator. The downward movement of the type-carrying recording wheels is transmitted to them through defendant's rock shaft and its arms which are engaged by the fin of its key as it is pushed in. It is true that this transmitted power only operates to print the hour and minute of the operation from the type carried by the type-recording wheels, for the number carried upon the stem of the operator's key is impressed upon the recording strip only as a result of the direct pressure of the operator's hand in pushing against the key. So far as the printing of the workman's number is done without the interposition of any other mechanism, the defendant possibly does not infringe. But so far as the key gives motion to other parts by which printing is done there is infringement, for to that extent defendant does use an impression mechanism actuated by the operation of the key. The complete impression mechanism of the defendant consists in the time-recording wheels, the rock shaft and its arms, E, e, and the key, C. The function of the impression hammer of the Bundy patent is to print upon the record-

ing strip the number of the workman and the time of the operation, and this it does by pressing together the recording strip, inking ribbon, and type. To produce this work, the impression mechanism is actuated by the key. The function of those parts of defendant's mechanism which have been substituted for Bundy's "impression hammer" is to do precisely the same thing by pressing together the strip, the inking ribbon, and the type. One presses the strip down upon the type, and the other presses the type down upon the strip. The instrumentalities by which the type and the paper are brought together are actuated in both cases by the key in the hands of the operator. In one case power is started by turning the key, and in the other by pushing against the key; but in both instances intervening mechanism is engaged and set in motion by metal projections upon the key. That the recording wheels constitute a part of the defendant's impression mechanism is not, in this case, material. One may not escape infringement by the mere joinder of two elements into one integral part. If the united part effects the same results, in substantially the same way as the separate parts before the union, the change is colorable. McDonald v. Whitney, 24 Fed. 600; Ballard v. McCluskey, 58 Fed. 880; Oval Wood Dish Co. v. Sandy Creek, N. Y., Wood Mfg. Co., 60 Fed. 285. It is clear that, unless Bundy is limited to a key which is operated only by turning, and a key which carries the number of the workman only upon a projection upon its side, and to an impression hammer operated only by a ward of a key "as it is turned," the fourth claim of the patent is infringed by the recorder of the defendant. We find nothing in the old art which should limit the claims in suit to the precise structure he has described, or deprive the inventor of a reasonable application of the doctrine of equivalents. The Lane & Hill machine nearly approximated a practical and successful time recorder. But the failure to so arrange the combination as that by the single act of operating the key the work of aligning and printing and feeding might all be done made it an impractical machine for the purposes for which such a machine was useful. The change required in order to make a recorder operative by the single act of turning a key may seem simple, now that it has been done. But neither Haskell, nor Dey, nor Bundy in his 1888 patent, succeeded in supplying the mechanism needed, though they tried in different ways, and although they had before them all that the old watchman's clock art could teach, as well as all that taught by Lane & Hill. Their inventions were useless, because they did not meet the conditions under which a workman's time recorder must be used.

The ingenuity of Bundy in his patent of 1891 lies in his key and its functions as covered by his claims. Whether his key actuated the feeding and printing mechanisms by being turned or pushed is not of the essence of the invention. Pushing keys setting in motion bolts and other mechanism were old, and but the equivalent of keys which did the same thing by turning. The only function of the bit upon which the workman's number was embossed was to carry that number into alignment with the time-recording type. That bit actuated no mechanism. The same result was accomplish-

ed by placing the workman's number upon the inner end of a key, which sets in motion other mechanism by pushing in place of turning. Neither was it invention to cause the printing to be done by pressing the type down upon the paper strip instead of pressing the paper strip against the type. The one was the plain equivalent of the other. Reece Buttonhole Mach. Co. v. Globe Buttonhole Mach. Co., 10 C. C. A. 194, 61 Fed. 958. That defendant's impression mechanism is not in the form or shape of a hammer is of no consequence unless the form itself is of the essence of the invention. This it was not.

In Winans v. Denmead, 15 How. 330–342, the court, in upholding a claim which covered a railroad car made of sheet iron "in the form of a frustum of a cone" against an infringer who had used a different geometrical form without introducing any new mechanical principle or mode of operation, or attaining any new result, among other things, said:

"Undoubtedly there may be cases in which the letters patent do include only the particular form described and claimed. Davis v. Palmer, 2 Brock. 309, Fed. Cas. No. 3,645, seems to have been one of those cases. But they are in entire accordance with what is above stated. The reason why such a patent covers only one geometrical form is not that the patentee has described and claimed that form only; it is because that form only is capable of embodying his invention; and, consequently, if the form is not copied, the invention is not used. Where form and substance are inseparable, it is enough to look at the form only. Where they are separable, where the whole substance of the invention may be copied in a different form, it is the duty of courts and juries to look through the form for the substance of the invention,—for that which entitled the inventor to his patent, and which the patent was designed to secure. Where that is found, there is an infringement; and it is not a defense that it is embodied in a form not described, and in terms claimed by the patentee. Patentees sometimes add to their claims an express declaration to the effect that the claim extends to the thing patented, however its form or proportions may be varied. But this is unnecessary. The law so interprets the claim without the addition of these words. The exclusive right to the thing patented is not secured if the public are at liberty to make substantial copies of it, varying its form or proportions; and therefore the patentee, having described his invention, and shown its principles, and claimed it in that form which most perfectly embodies it, is, in contemplation of law, deemed to claim every form in which his invention may be copied, unless he manifests an intention to disclaim some of those forms."

So, in Machine Co. v. Murphy, 97 U. S. 120–125, the court said:

"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 of 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 manner, to obtain a like 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 a substantially different result. Nor is it safe to give much heed to the fact that the corresponding device in two machines, organized to accomplish the same result, are different in shape or form, one from the other, as it is necessary in every special investigation to look at the mode of operation, or the way the device works, and at the result, as well as at the means by which the result is obtained."

We are not unaware of the principle that the mere fact that two machines produce the same effect does not establish that one is an infringement of the other. If it were so, it would operate as an admission that an inventor is entitled to patent his function. To be an infringement, "the alleged infringer must have done something more than reach the same result. He must have reached it by substantially the same or similar means, or the rule that the function of a machine cannot be patented is of no practical value." Westinghouse v. Power-Brake Co., 170 U. S. 569, 18 Sup. Ct. 723. But, on the other hand, a charge of infringement is often made out, though the letter of the claim be avoided. Machine Co. v. Murphy, 97 U. S. 120–125; Elizabeth v. Pavement Co., Id. 126–137; Hoyt v. Horne, 145 U. S. 302–308, 12 Sup. Ct. 922; Westinghouse v. Power-Brake Co., 170 U. S. 537, 538, 18 Sup. Ct. 707. That Bundy is not, in a broad sense, a pioneer in this art, may be conceded. But his invention was such as to mark a distinct step in the progress of the art. Indeed, his mechanism was the first successful structure of its kind. To be entitled to the benefit of the doctrine of equivalents, it is not essential that the patent shall be for a pioneer invention in the broad sense of that term. If his invention is one which has marked a decided step in the art, and has proven of value to the public, he will be entitled to the benefit of the rule of equivalents, though not in so liberal a degree as if his invention was of a primary character. Mr. Justice Jackson, in Miller v. Manufacturing Co., 151 U. S. 186, 207, 14 Sup. Ct. 310, 318, said, "The range of equivalents depends upon the extent and nature of the invention." The meritoriousness of an improvement depends —First, upon the extent to which the former art taught or suggested the step taken; and, second, upon the advance made in the usefulness of the machine as improved. In McCormick Harvesting Mach. Co. v. C. Aultman & Co., 37 U. S. App. 299, 16 C. C. A. 259, and 69 Fed. 371, this court said:

"Whether he specifically claims in his patent the benefit of equivalents or not, the law allows them to him according to the nature of his patent. If it is a mere improvement on a successful machine, a mere tributary invention, or a device the novelty of which is confined by the past art to the particular form shown, the range of the equivalents is narrowly restricted. It is a pioneer patent with a new result. The range is very wide, and is not restricted by the failure of the patentee to describe and claim combinations of equivalents. Nothing will restrict the pioneer patentee's rights in this regard save the use of language in his specifications and claims which permits no other reasonable construction than one attributing to the patentee a positive intention to limit the scope of his invention in some particular to the exact form of the device he shows, and a consequent willingness to abandon to the public any other form, should it be adopted and prove useful. Instances of such a limitation may be found in Keystone Bridge Co. v. Phœnix Iron Co., 95 U. S. 274, and in Brown v. Manufacturing Co., 6 U. S. App. 427, 16 U. S. App. 234, 6 C. C. A. 528, and 57 Fed. 731."

In the view we have of the step taken by Bundy, we think he is entitled to protect his real invention by a reasonable application of the rule of equivalents. We find in the structure of defendant all the elements of Bundy's combination, or their mechanical equivalents, combined in substantially the same way, and performing

substantially the same functions, and producing identically the same result as that effected by the same elements in Bundy's device.

Neither do we find anything in the proceedings in the patent office which, properly understood, should limit him to either a turning key or one carrying the operator's number on its bit. The circuit court fell into error in assuming that claim 3 of Bundy's patent was substituted for claim 2 of his original claims, the latter being canceled upon a reference to the patent of Lane & Hill. Bundy's claims 1 and 2, as originally filed, were as follows:

"(1) In a time-recording apparatus, hour and minute wheels, a rotating key provided with a number or character upon a bit thereof, to register the operators upon a strip, and an impression hammer. (2) In a time-recording apparatus, the combination with the impression hammer of hour and minute registering wheels, a key inserted and turned to bring the number or character upon the bit thereof into alignment with said wheels and a registering strip."

Claims 10 and 11 of his original application were as follows:

"(10) A clock movement, hour and minute registering wheels, synchronous mechanism actuating said wheels independently of each other and actuated by the clock movement, and a key provided with a bit carrying numbers brought into alignment with the hour and minute wheels by the turning of the key, a registering strip and an impression hammer, in combination as set forth. (11) A clock movement, hour and minute registering wheels, snychronous mechanism actuating said wheels independently of each other and actuated by the clock movement, a key provided with a bit carrying numbers brought into alignment with the hour and minute wheels by turning of the key, a ward upon the key, a registering strip, an impression hammer operated by mechanism actuated by the ward of said key as it is turned, in combination as set forth."

The other claims of his original application relate entirely to different subjects, and have no effect in the construction of those allowed and involved in this case. Claim 1 was rejected upon a reference to the Bauer watchman clock patent, No. 305,882, and because the elements were not claimed in combination. Claim 2 was rejected upon the statement that it was met in the Lane & Hill patent, No. 210,788. Claims 10 and 11 were rejected because it was "not seen that the wheels" are independent of each other, as stated. Claim 1 was amended so as to read as follows:

"(1) In a time-recording apparatus, the combination with the hour and minute wheels rotated synchronously with a clock movement of a key provided with a number or character upon a bit thereof, to be rotated to record the number or character upon a strip, and an impression hammer."

In respect to the reference to Bauer, Bundy replied to the ruling of the examiner that "the Bauer patent does not show the synchronous hour and minute wheels, and consequently this imparts novelty to the claim as amended." This claim, as amended, was again rejected, the examiner ruling that "the claim now presented is held to cover nothing patentable over what is shown in Bauer, before cited." Claim 2 was amended by changing "registering" to "recording," and again filed with the insistence that "this claim is not anticipated by the Lane & Hill patent, 210,788, for the reason that in that patent the key, when inserted, is in alignment for the printing. My device requires the turning of the key to

bring the number into alignment, and my claim is specific as to the turning of the key." The claim, as amended, was again rejected upon the ground that "the second claim as met in Lane & Hill, before given, in view of the fact that it does not make any difference, in a patentable sense, whether the key is turned, as in Bauer, or not turned, as in Lane & Hill." Claim 10 was amended by changing "registering" to "recording," and by striking out the words "independently of each other," thus meeting the only objection made to that claim. Claim 11 was amended in the same way to meet the same objection, and both 10 and 11, as thus amended, were allowed as claims 3 and 4 of the patent as issued.

It will thus be seen that neither of the claims here involved were ever rejected upon a reference to either Bauer or Lane & Hill, and were originally disallowed upon a ground in no wise affecting the question of infringement here involved, and, as allowed, include everything included as originally filed, except the clause as to the independent character of the two recording wheels. Both of these claims as originally presented concluded with the words, "in combination as set forth." Claims 1 and 2, as rejected, were manifestly unwarrantably broad claims. Neither contained the limiting words, "in combination as set forth." Both were subject to a construction which would include a key as an element which had no other function than to carry the workman's number into alignment with the recording wheels. This was the construction placed upon the claims by the examiner. Thus construed, it was manifestly a matter of no importance, in a patentable sense, whether such alignment was effected by a pushing or turning key, and hence the aptness of the reference to Bauer and Lane & Hill. Both claims were subject to a construction which would include recording strip and impression mechanism actuated by mechanism not set in motion by the operation of the key, but by a crank or handle as in Lane & Hill. The effect to be attached to the rejection of a claim by the patent office was thoroughly considered by this court in Thomas v. Spring Co., 47 U. S. App. 125–145, 23 C. C. A. 211, 221, and 77 Fed. 420, 430, and the general rule stated to be that, "when the patent office rejects a claim covering a certain device on its merits, and such rejection is acquiesced in, and the patent issues, the applicant cannot afterwards be allowed a construction of the claims allowed wide enough to embrace the claim which was rejected." Bundy was not required to limit himself to a "turning key" in order to secure the allowance of his claims. When he called attention to the fact that his device required the turning of his key when inserted "in order to bring the number thereon into alignment," and then sought to sustain claims which would have included a device in which the feeding and printing mechanism might be set in motion by some means independent of the key, as in Lane & Hill, the examiner disposed of that distinction by saying that "it made no difference, in a patentable sense, whether the key is turned as in Bauer, or not turned, as in Lane & Hill." The essential difference between Lane & Hill and Bundy was in the fact that Bundy's key actuated his printing and feed-

ing mechanism, and also carried the operator's number into alignment with the type upon the type-recording wheels. The last function is the only function of the so-called "key" of Lane & Hill, the printing and feeding mechanism in that device being set in motion by other and independent means. Now, whether Bundy's key actuated his feeding and printing mechanism by being turned or by being thrust is not of the essence of his invention at all, and, to use the ruling of the patent office, "it makes no difference, in a patentable sense, whether the key is turned as in Bauer, or not turned as in Lane & Hill." Bundy did not, therefore, surrender every other mode of operating his key, and limit himself to a turning key, by any amendment which was forced upon him in the patent office. If he is limited to a turning key, and must stand by and see his real invention robbed by the mere change in the form of the key, whereby, by an inward thrust, it engages with and actuates mechanisms for printing and feeding which are but the equivalents of those actuated by his turning key, it must be the result of a strict interpretation of his claims by reason of the language he has voluntarily employed in them. This, we have already seen, is not the necessary legal result, and that he is entitled to a reasonable equivalent for a turning key. To be estopped by the action of the patent office, the patentee must be shown to have surrendered something which he now claims in order to obtain that which was allowed. That which he was required to surrender was the broad claims included in his original claims, numbered 1 and 2. When we limit him to a mechanism in which his printing and feeding devices are actuated by the operation of his key in the hands of the operator, we have given to the rejection of those claims every effect which is required.

The third and fourth claims should, as a consequence of the cancellation of claims 1 and 2, be so construed as not to include the broad claims of the rejected application. But this we have done independently of any effect resulting from the cancellation of claims by the patent office, and we have construed both claims 3 and 4 as including a recording strip and impression hammer actuated by mechanism set in motion by the operation of the key in the hands of the operator. True, we have not limited Bundy to impression mechanism in the shape or form of a hammer, nor to a key operated only by turning or carrying the workman's number only on a projection upon its side. To have done so would be to destroy his patent, and open his invention to the assaults of those who, with only colorable changes, could avail themselves of the very heart of his invention.

Complainant also owns the patent to Bauer of September 30, 1884, for a watchman's time detector, and it is claimed that defendant's key infringes the fourth claim of that patent. Bauer's patent expired July 26, 1896, the date of the expiration of his English patent. This bill was filed April 2, 1896, and therefore before the expiration of the patent. The fourth claim of Bauer is only for a key and a key "for a time detector." It is expressly limited to a key "having a bit or bits provided with projecting type to

make the impression on the slip substantially as set forth." If construed to cover a key which does not turn, and which carries type only on the end of its stem, it would be anticipated by the key in Lane & Hill. It must be limited to the key described, and, as thus limited, defendant does not infringe.

The decree must be reversed as to the third and fourth claims of the Bundy patent, and remanded, with directions to enter a decree finding defendant guilty of infringement of those claims, and for an injunction and an account. Appellee will pay the costs of this appeal.

THE EDWARD LUCKENBACK.

(District Court, S. D. New York. May 5, 1899.)

COSTS IN ADMIRALTY—ACTION FOR COLLISION—BOTH VESSELS IN FAULT.

Where, on a libel for collision, both vessels are held in fault, and, libelant's vessel alone having been injured, no cross libel is filed, and libelant recovers half his damages, each side will be allowed one-half its taxable costs.

In Admiralty. On application for taxation of costs.

Carpenter & Park, for libelant.
James J. Macklin, for respondent.

BROWN, District Judge. In this case the libelant's vessel and the claimants' vessel being both held in fault, the damages were directed to be divided. The claimants' vessel was not injured by the collision, so that there was no cross libel, nor any damages set up in the answer. The libelant claims an allowance of half his costs, without taking into consideration the costs of the respondent. The latter contends that the practice in this district, in cases of mutual fault, is that the costs of both sides shall be divided as well as the damages,—the same as if a cross libel had been filed for the recovery of damages to respondent's vessel.

The general subject was carefully reviewed by Blatchford, J., in Vanderbilt v. Reynolds, 16 Blatchf. 80, Fed. Cas. No. 16,839, from which it appears that in cases like the present, costs for the most part have been either refused to each side, or else the costs of both have been apportioned between them. The precise point afterwards arose before him on appeal in the case of The Warren, 25 Fed. 783, 784, where the libelant's vessel alone was damaged, but both being held in fault, the libelant recovered half damages; and on consideration it was held that "the costs of both parties should have been equally apportioned," and both having appealed the same rule was also applied to the costs of the appeal. It is noticeable, moreover, that in that decision, Mr. Justice Blatchford construed the case of The America, 92 U. S. 432, 438, as requiring the costs of both sides to be apportioned, and not the costs of the libelant alone in cases like the present. The case of The Warren was decided by Mr. Justice Blatchford in July, 1885, and the practice in this court has since then been in accordance with that decision. It was applied in the case of The Max Morris, 24 Fed. 860, where each side taxed one-half its costs, as appears on the face of the