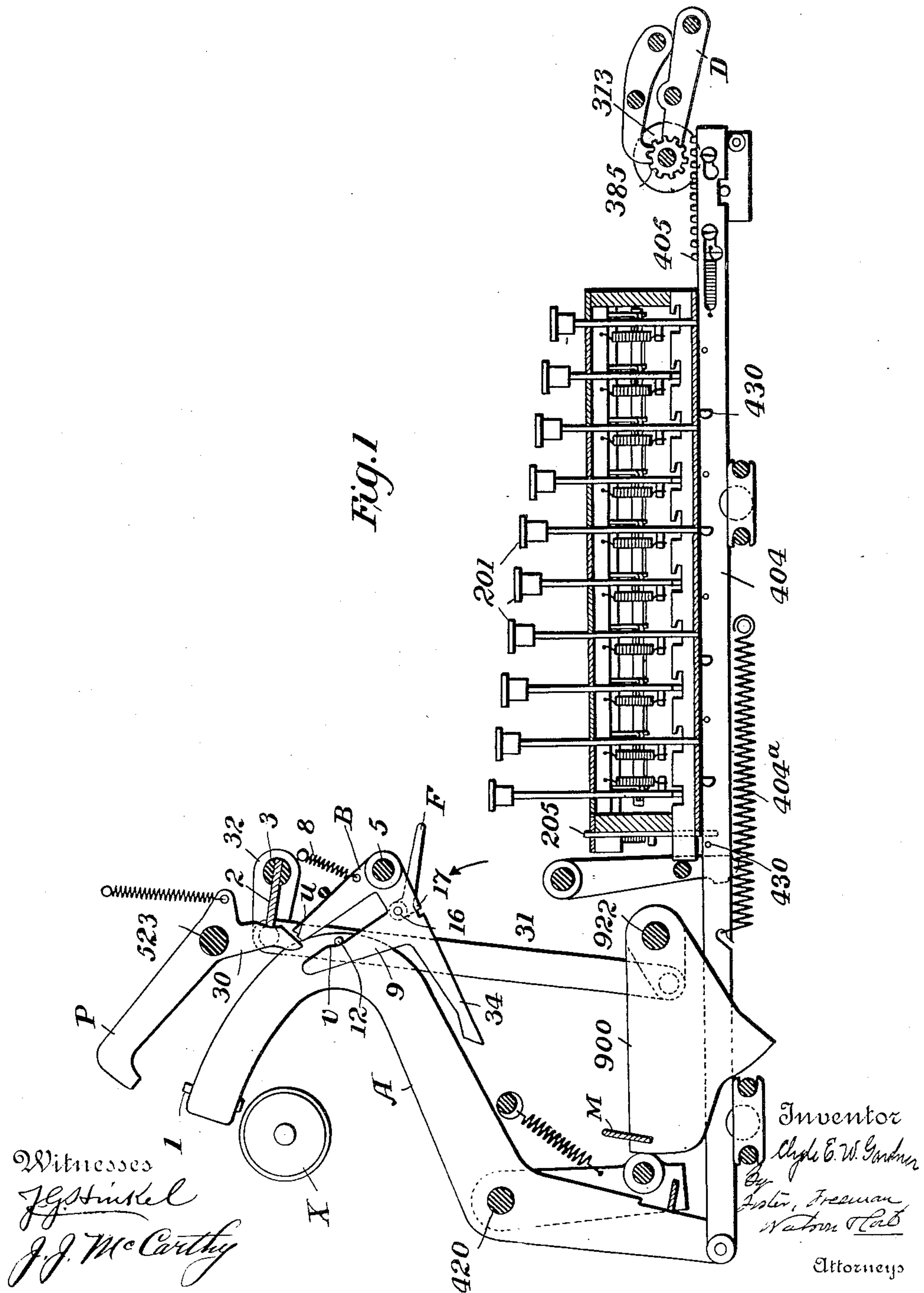


966,194.

Patented Aug. 2, 1910.

5 SHEETS—SHEET 1.

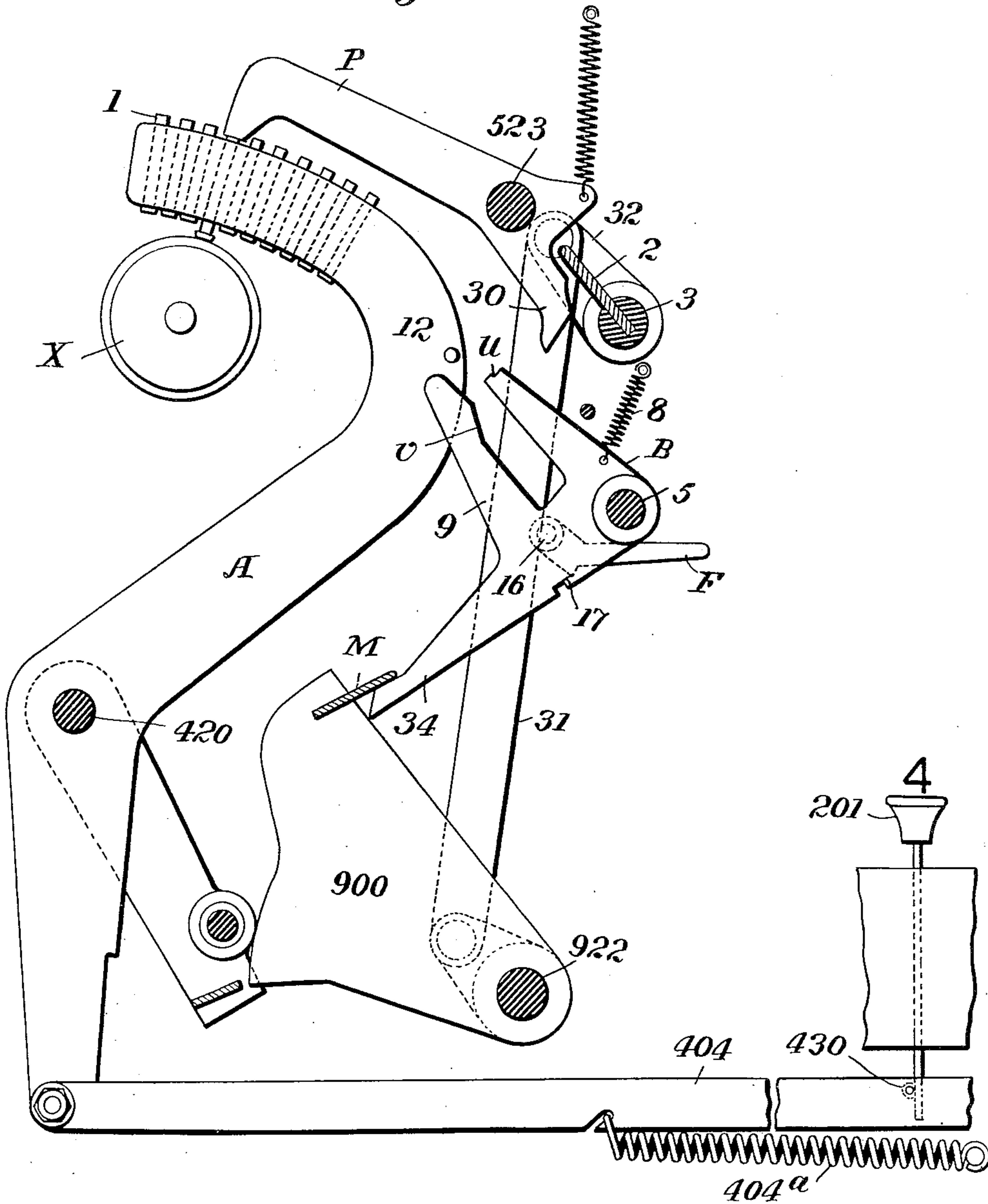


966,194.

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5 SHEETS—SHEET 2.

Fig. 2.



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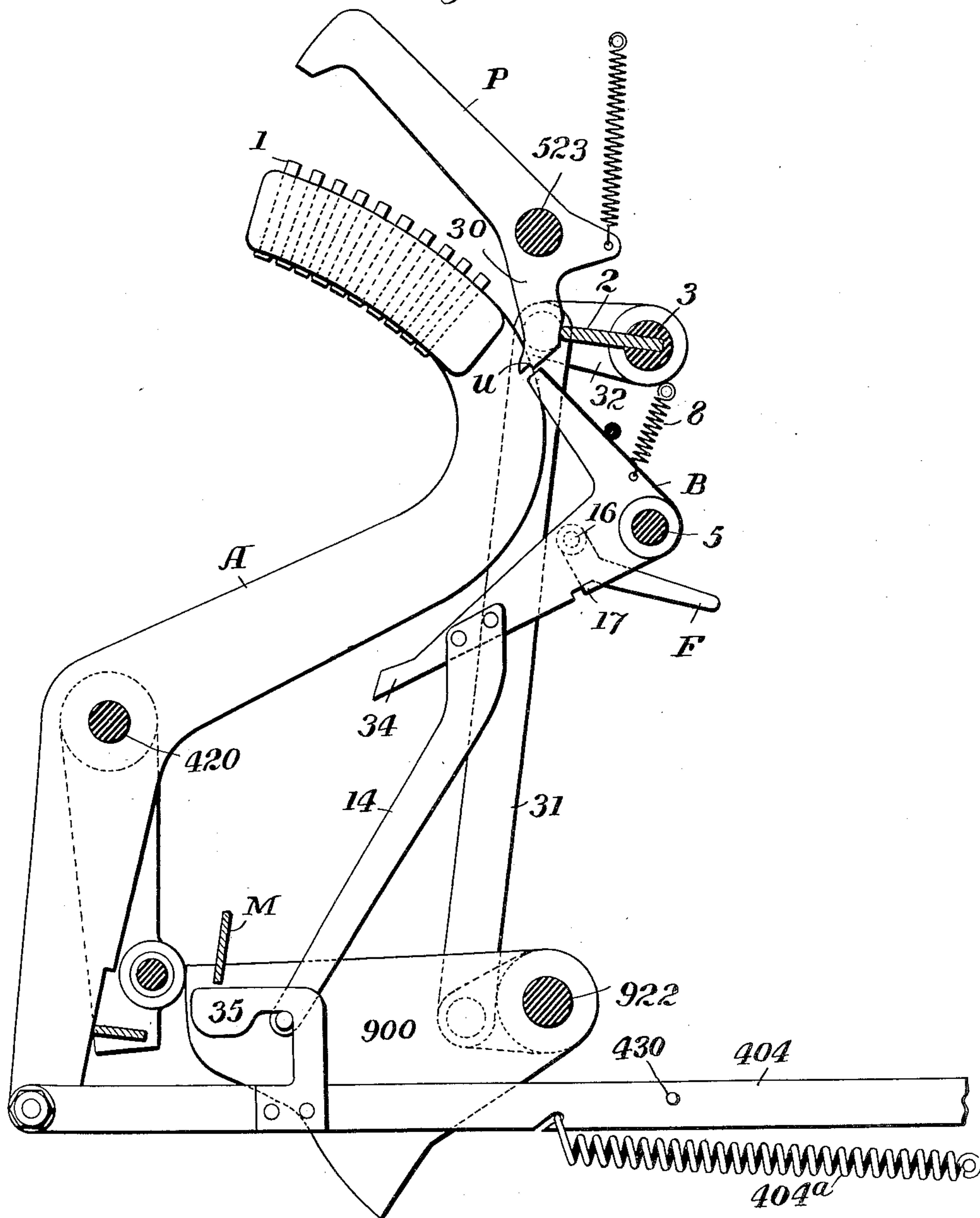
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5 SHEETS—SHEET 4.

Fig. 6.



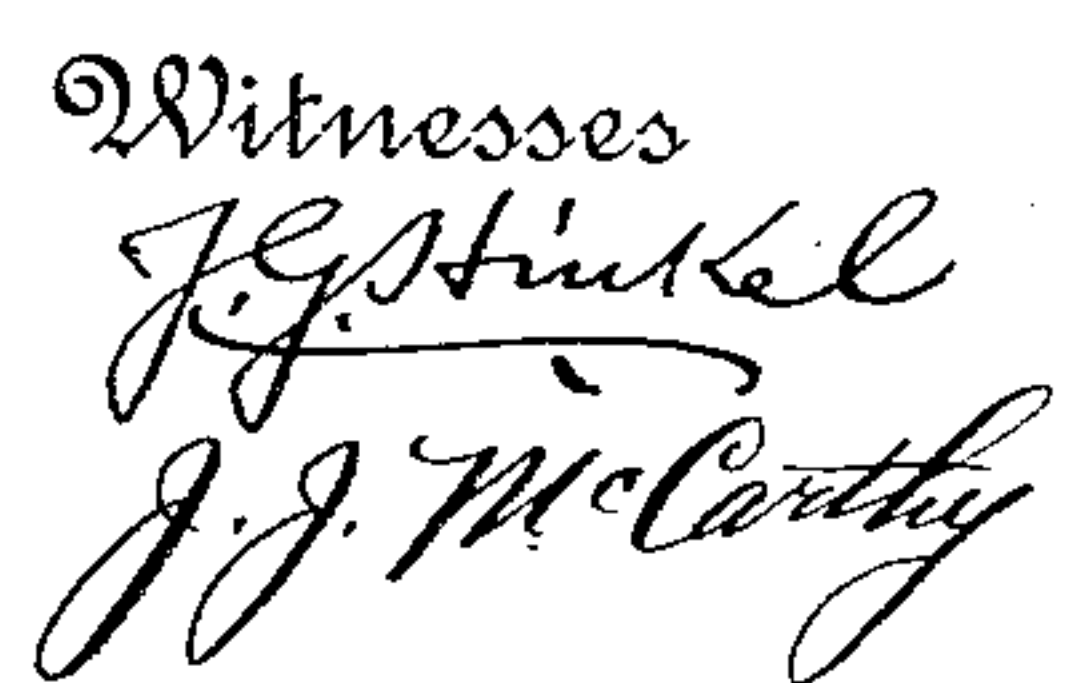
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Fig. 7.



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CLYDE E. W. GARDNER, OF ORANGE, NEW JERSEY, ASSIGNOR TO PIKE ADDING MACHINE COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

RECORDING MECHANISM.

966,194.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed May 8, 1908. Serial No. 431,679.

To all whom it may concern:

Be it known that I, CLYDE E. W. GARDNER, am a citizen of the United States, residing at Orange, in the State of New Jersey, and have invented certain new and useful Improvements in Recording Mechanisms, of which the following is a specification.

This invention relates to recording mechanism, and, while it is used in connection with different apparatus, it is preferably of a character to coact with the elements of an adding mechanism, and the invention consists in the construction and arrangement of parts fully set forth hereinafter and illustrated in the accompanying drawing, in which:

Figure 1 is an elevation of my improved recording mechanism showing its relation to the keys and adjusting devices of an adding machine; Fig. 2 illustrates the recorder enlarged, the parts in a different position from that shown in Fig. 1; Fig. 3 is a view of the series of detents looking in the direction of the arrow Fig. 1; Figs. 4, 5 and 6 are views illustrating different detent operating means; Fig. 7 is a side elevation illustrating my invention in connection with hammers, detents and actuating means of a different character.

My invention is adapted for use in that class of recording mechanisms in which there are type carriers A, each supporting a series of type 1, and means for depressing the said type after they are brought in proper position above a platen X, as, for instance, hammers P, there being one hammer for each type carrier, and the parts being so constructed and arranged that after a carrier is set in position to bring its proper type into printing relation to the platen the hammer contact with said type will secure the desired imprint.

For illustration of my invention I have shown these parts as constructed and arranged in connection with an adding machine such for instance as the adding machine of the Letters Patent to W. H. Pike, Jr., No. 763,692, where the carriers are pivoted carriers swinging on a bar 420 and connected with rack strips 404, moved in one direction by springs 404^a, and are restored by means of a cam 900, mounted on a working shaft 922, the proper movement of the rack strips to bring the desired type into position

being effected by devices controlled by keys 201, the stems of which are struck by lugs 430 on the strips 404. Each rack strip carries a rack 405 adapted to gear with pinions 385 connected to number wheels 313, the pinions and wheels being carried by a movable frame D, which can be raised and lowered to carry the pinions and racks into and out of engagement. In the construction of Fig. 4 the rear lug 430 of each strip 404 is so set that it may strike an arm 205 after such a movement of the strip as will result in bringing a cipher type of the coacting carrier into printing position, this operation always resulting on the lifting of the cam 900 and where no key of a series is depressed. But on depressing any key, a shoulder on its stem meets an arm 207, Fig. 5, on the shaft 215 carrying the arm 205, and the latter is carried out of the path of the said lug 430 and the strip and a type carrier can move until one of the other lugs 430 is arrested by contact with the stem of the key depressed and the type corresponding to the figure on the said key is in printing position. In securing this initial step movement of each strip 404 and its carrier by the means above described, the cam 900, as shown in Figs. 1 and 2, is so shaped as to permit all of the carriers to move to carry the ciphers into printing line as the cam is lifted, the printing being effected only by those type which may thereafter be struck by the hammers. It is not necessary here to more fully describe the construction and operation of these parts, nor to illustrate the details of devices connected therewith in adding, as my invention may be fully understood from the illustration shown in the drawing and the following description.

Each hammer oscillates on a shaft 523 and is raised by a resetting bar or blade 2, which, as shown in Figs. 1 and 2, is on a rock shaft 3 and is adapted when swung into contact with the hammers (as against tails 30, thereof) to lift the hammers simultaneously. This lifting action is preferably driven from the working shaft 922, an arm on the latter being connected by a link 31 with an arm 32 on the shaft 3, the lifting operation taking place after the hammers have effected the printing of an item. When the restoring blade is carried from the hammers they may descend under the action of their actuating means unless further retained as hereinafter

set forth. It is necessary to retain out of action those hammers which are not required to effect a printing action and for this purpose I combine with the hammers a series of
 5 detents B, one to each hammer, and each of which in engaging position will contact with some part of its coacting hammer, as the tail 30, and thus hold up the hammer even if the restoring blade has moved away from the
 10 hammer. As shown the detents are arms swinging on the bar 5, each in one direction under the action of a spring 8.

With the detents are combined shifting means which may be of any suitable construction adapted to contact with any parts
 15 of the detents so as to swing them out of engagement with the hammers. As shown each detent has an arm 9, and the shifter consists of a cross bar M, which is normally
 20 out of coacting relation to the detents; that is, the movement of the shifter will not result in imparting any movement to the detent until the latter has been set out of its normal position as the result of a movement
 25 of some part of the apparatus, which takes place during the first part of the movement of the coacting type carrier. As shown in Figs. 1 and 2, the shifter is a blade carried by the cam 900.

30 So long as any type carrier is in its initial or normal position, that is in a position in which a figure is not on the printing line, the swinging movement of the shifter M will have no effect in setting a detent and re-
 35 leasing its coacting hammer. Means are provided however whereby upon the movement of any type carrier sufficient to bring any type representing a "figure" (under which
 40 term I include only the nine digits) into position to print, the coacting detent will be set to a different position from its normal position, which different position is one
 45 which will insure a coaction between the said detent and the shifter, and thereby on the subsequent movement of the shifter the de-
 50 tent will be further moved to an extent to release the hammer and insure the imprint. It will thus appear that each detent is under the control of two different operating
 55 means, one of which on the movement of its coacting carrier sets it to a slight extent away from its normal position, and in a position to be operated by the shifter, the other means being the shifter itself which
 60 further moves the detent so as to release or permit the release of the hammer. The first setting movement of the detent is secured at the time of the movement or beginning of the movement of the type carrier from the
 65 depression of a key bringing a figure of value into position to print, and may be effected either from the carrier or from the other moving parts of the machine.

As shown in Figs. 1 and 2, each type car-
 65 rier is provided with a part adapted to make

contact with some part of the adjacent de-
 tent or some connection therewith. For in-
 stance, the carrier has a lug 12 of such size
 and position as, by contact with a shoulder *v*
 of the arm 9 to impart just sufficient move- 70
 ment to the detent as will carry a finger 34
 of the detent into position for an inclined
 edge of the finger to coact with the shifter
 M when the latter is operated. It will be
 evident that if a high number is to be print- 75
 ed causing an extended movement of the
 type carrier so that the lug 12 of a type car-
 rier would pass from contact with the arm 9
 of the detent, the latter would then be re-
 stored by its spring 8 to its original normal 80
 position and would not be operated upon the
 subsequent movement of the shifter. To
 prevent this result I provide the hammer or
 the detent with a shoulder *u*, so that when
 the detent is set to its first position by the 85
 action of the lug 12, or otherwise, the shoul-
 der *u* will be carried below the tail 30 which
 being then opposite the shoulder will pre-
 vent the return movement of the detent, un-
 der the action of the spring 8, and the detent 90
 then will remain in position to coact with
 the shifter, after the lug 12 has passed from
 contact therewith and during the entire
 travel of the carrier. This avoids the ne-
 cessity of extending the arm 9 to a great 95
 length to maintain contact with the bearing
 13 in all positions of the carrier. It is of
 course not essential to set the detent to its
 first position from any special part of the
 mechanism. Instead of imparting it from 100
 the lug or projection upon the carrier it
 may be imparted from a projection or cam
 35 upon one of the rack strips 404, Fig. 6, an
 arm 14 of the detent, extending downward
 into position to make contact with the said 105
 cam upon the rack strip at the proper period
 of movement.

In printing mechanism of the character
 adapted for use with adding machines there
 are parts which coact with the hammers, so 110
 constructed that when one of these parts is
 moved to release—or upon the release of—
 the hammer, it will impart motion to the
 part at the right of it, and from this, mo-
 tion will be imparted to the part connected 115
 with the next hammer, and so on, so that the
 hammers will be successively released, an
 operation, as is well understood, that is nec-
 essary to print ciphers below or at the right
 of the last figure of an item, and generally 120
 these parts consist of detents with tails or
 contact pieces, each extending from one of
 the detents in position to strike the next be-
 low it and impart movement thereto. It is
 frequently desired to avoid this automatic 125
 transfer of movement from one part or ele-
 ment to the other so, for instance, as to
 limit the printing to only a section of the
 type carriers, and to secure this result I
 provide each detent, or other transfer de- 130

vice, or if necessary, one or more of the detents, with a movable contact piece, shown as a lever F, frictionally pivoted at 16 to the side of the detent or transfer element and capable of adjustment by hand to the desired position so that on adjusting the said element the lug 17 or other projection thereof will be brought into engagement with the contact piece of the next transfer element, and swing the same, and this will operate the next element, and so on. By setting this contact piece to another position it will not be struck by the next element at the left and no movement will therefore be imparted to the element at the right. Of course such adjustable contact piece and the transfer elements may be made in different forms and differently arranged, and it will be evident that where the division between the operated and non-operated elements is always to be at a single point, or at a plurality of fixed points, it is only necessary to have the adjustable contact piece at such point or points instead of in all of the elements.

In Figs. 3, 4 and 5 the detents are shown as connected by thin flexible rods 37 with arms 38 on the arms 205, each of which on being swung to one side, on depressing any key of its associated series, will draw on the rod and set the detent to position to make contact with the shifter the rod springing to one side on the further adjustment of the detent.

In the construction shown in Fig. 7, the hammers have hooks 7, engaging hooked ends 6 of the detents, and rollers 38 on the latter are arranged to be pushed back by inclines on projecting parts or tails 39 of the carriers, and to avoid making the latter of undue length each hammer has a shoulder *u* which after setting the detent to its first position is opposite the hook of the detent and prevents the latter from being returned to normal position by its spring. The shifter is a blade or bar M' carried by a frame N having a lug 40, which bar M' is struck by the edge of the cam 900 when the latter rises, and the hammers are reset by the cross-bar 12 of a frame D pivoted at 13, a lug 14 of which frame is struck by an arm Q on the working shaft 922.

While I have illustrated my invention in connection with means by which the carriers are moved from normal position to an initial position to print ciphers, it will be evident that the invention is as applicable where the carriers normally occupy such an initial position, the action of the shifter on the detent only resulting when a carrier is moved beyond the initial cipher printing position.

Without limiting myself to the precise construction and arrangement of parts shown, I claim as my invention:

1. In a recording mechanism, the combination with a platen, series of type carriers, and series of hammers and hammer actuating means, of a detent for each hammer, devices for actuating the detents to release the hammers normally out of coacting relation to said detents, and means whereby the detents and said devices are put into coacting relation on the movement of any type carrier beyond its initial position.

2. In a recording mechanism, the combination with a working shaft, a platen, series of type carriers, and series of hammers and hammer actuating means, of a detent for each hammer, devices, and means for operating them from the working shaft, for actuating the detents to release the hammers, said devices normally out of coacting relation to said detents, and means whereby the detents and said devices are put into coacting relation on the movement of any type carrier beyond its initial position.

3. The combination in a recording mechanism, of a series of type carriers and a plurality of type on each carrier, hammers and hammer actuating means, a detent for each hammer, detent shifting means normally out of coacting relation to said detents, and means arranged to be actuated on the movement of any type carrier to bring the detents and shifting means into coacting relation.

4. The combination with the movable type carriers and hammers of a recording mechanism, of a detent for each hammer, shifting means for each detent, the detent and said means normally out of coacting relation, and means whereby the shifting means and detents are brought into coacting relation on the movement of each carrier beyond its initial position.

5. The combination with the movable type carriers and hammers of a recording mechanism, of a detent for each hammer, shifting means for each detent, the detent and said means normally out of coacting relation, and means including a projection on each carrier whereby the shifting means and detents are brought into coacting relation on the movement of each carrier beyond its initial position.

6. The combination with the movable type carriers and hammers of a recording mechanism, of a detent for each hammer, shifting means for each detent, the detent and said means normally out of coacting relation, and a projection on each carrier arranged to contact with a part of the adjacent detent to set the latter in position to be actuated by the shifting means.

7. The combination in a recording mechanism of a series of type carriers, a series of hammers, a detent for each hammer, means for shifting each detent to release its hammer, said shifting means normally out of

coacting relation to said detents, and means for bringing each detent into operative relation to its shifting means on the movement of the coacting type carrier beyond its initial position.

8. The combination in a recording mechanism, of a series of type carriers, a series of hammers, a detent for each hammer, means for shifting each detent to release its hammer, and contacting parts on the carriers and detents for setting the latter, on the movement of the carriers beyond their initial positions, in position to be actuated by the shifters.

9. The combination in a recording mechanism, of an operating shaft, a series of type carriers, a series of hammers, a detent engaging each hammer, means normally out of coacting relation to said detents adapted to be actuated from said shaft for shifting the detents, and means whereby the detents and shifting means are put out of and into coacting relation.

10. The combination in a recording mechanism, of an operating shaft, a series of type carriers, a series of hammers, a detent for each hammer, means normally out of coacting relation to said detents adapted to be actuated from said shaft for shifting the detents, and means whereby each detent is set into coacting relation to its shifting means as the coacting carrier is moved to position to print figures.

11. The combination with the type carriers, hammers and actuating shaft of a recording mechanism, of detents engaging said hammers, devices normally out of coacting relation to said detents for shifting said detents out of engagement with the hammers, and means for setting the detents in position to coact with the shifting devices as the coacting carrier is moved to position to print figures.

12. The combination with the type carriers, hammers and actuating shaft of a recording mechanism, of detents engaging said hammers, shifting devices normally out of coacting relation to said detents adapted to engage the detents operable from the actuating shaft, and supplemental means for setting the detents in position to engage the shifting devices as the coacting carrier is moved to position to print figures.

13. The combination of the movable type carriers, hammers and hammer-actuating means of a recording mechanism, of detents

engaging said hammers to retain them out of action, shifting devices for the detents, said shifting devices normally out of coacting relation to said detents, means for setting the detents in position to be acted on by the shifting devices, the engaging parts of the hammers and detents having shoulders arranged to prevent the displacing of the detents after being set in position to engage the shifter.

14. The combination in a recording mechanism, of a series of movable carriers each supporting a series of type, a hammer for each series of type, a detent for each hammer, detent shifting means normally out of engagement with the detents, and means for carrying the detents into and out of position to be acted on by the shifting means.

15. The combination in a recording mechanism, of a series of movable carriers each supporting a series of type, a hammer for each series of type, detents for the hammers provided with arms, shifting devices normally out of engagement with said arms, projections on the carriers adapted to engage the detents to set them in position for their arms to engage with the shifting devices.

16. The combination in a recording mechanism, of a series of movable carriers each supporting a series of type, a hammer for each series of type, detents for the hammers provided with arms, shifting devices normally out of engagement with said arms, projections on the carriers adapted to engage the detents to set them in position for their arms to engage with the shifting devices, and shoulders on the hammers arranged to prevent the displacing of the detents after the carriers have moved out of contact therewith.

17. The combination with the movable type carriers and hammers of a recording mechanism, of detents for the hammers and two means for moving said detents, one consisting of shifters normally out of coacting position, and the other consisting of means for insuring the coacting position of the shifters and detents.

In testimony whereof I affix my signature in presence of two witnesses.

CLYDE E. W. GARDNER.

Witnesses:

JOHN T. LANGHORNE,

EDMUND G. LANGHORNE.