

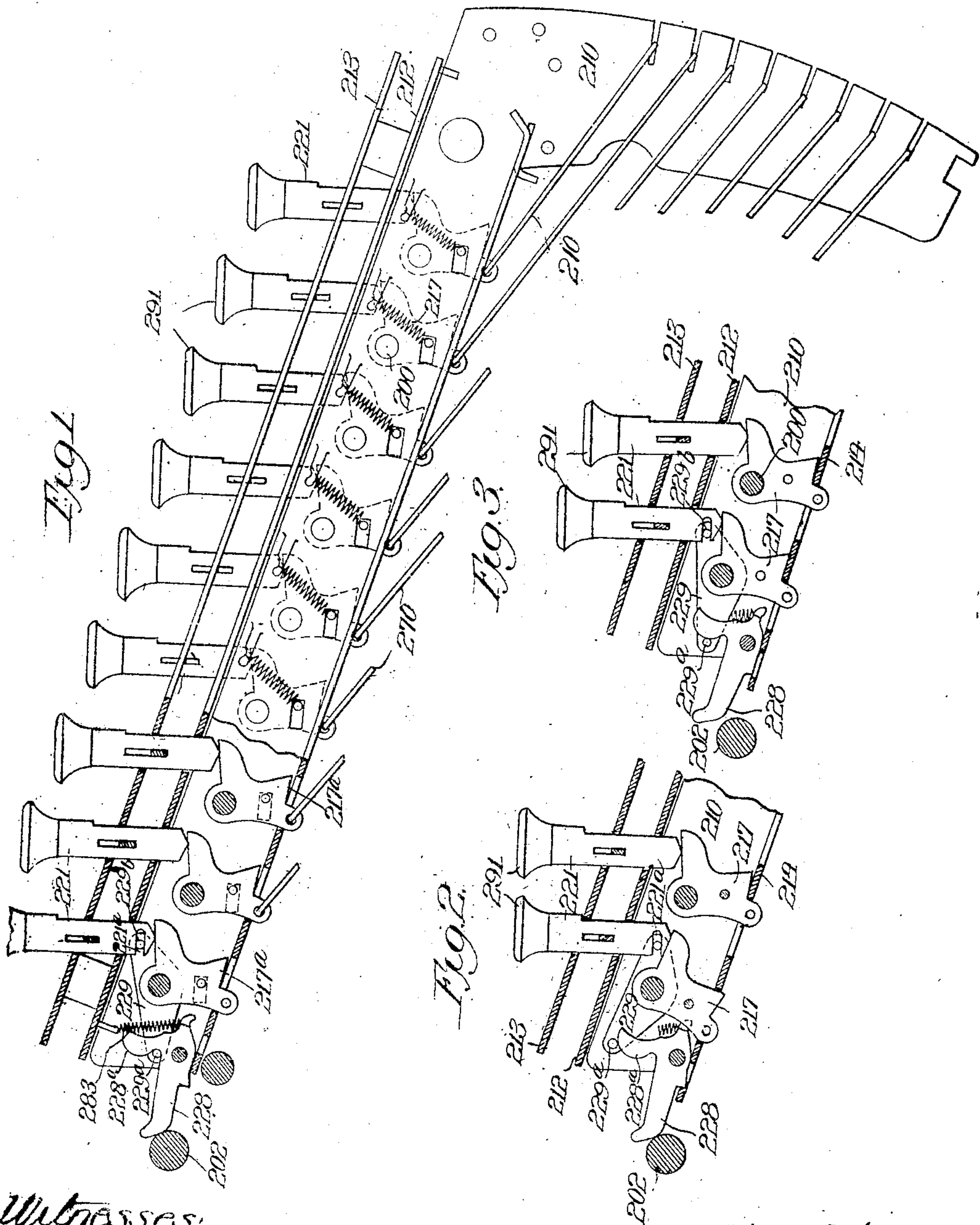
899,965.

H. L. FISHER.  
ADDING MACHINE.

APPLICATION FILED JUNE 30, 1905.

Patented Sept. 29, 1908.

4 SHEETS—SHEET 1.



Witnesses:  
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Louis B. Gruen

Inventor  
Harvey L. Fisher  
By Rector & Hibben  
his Attys



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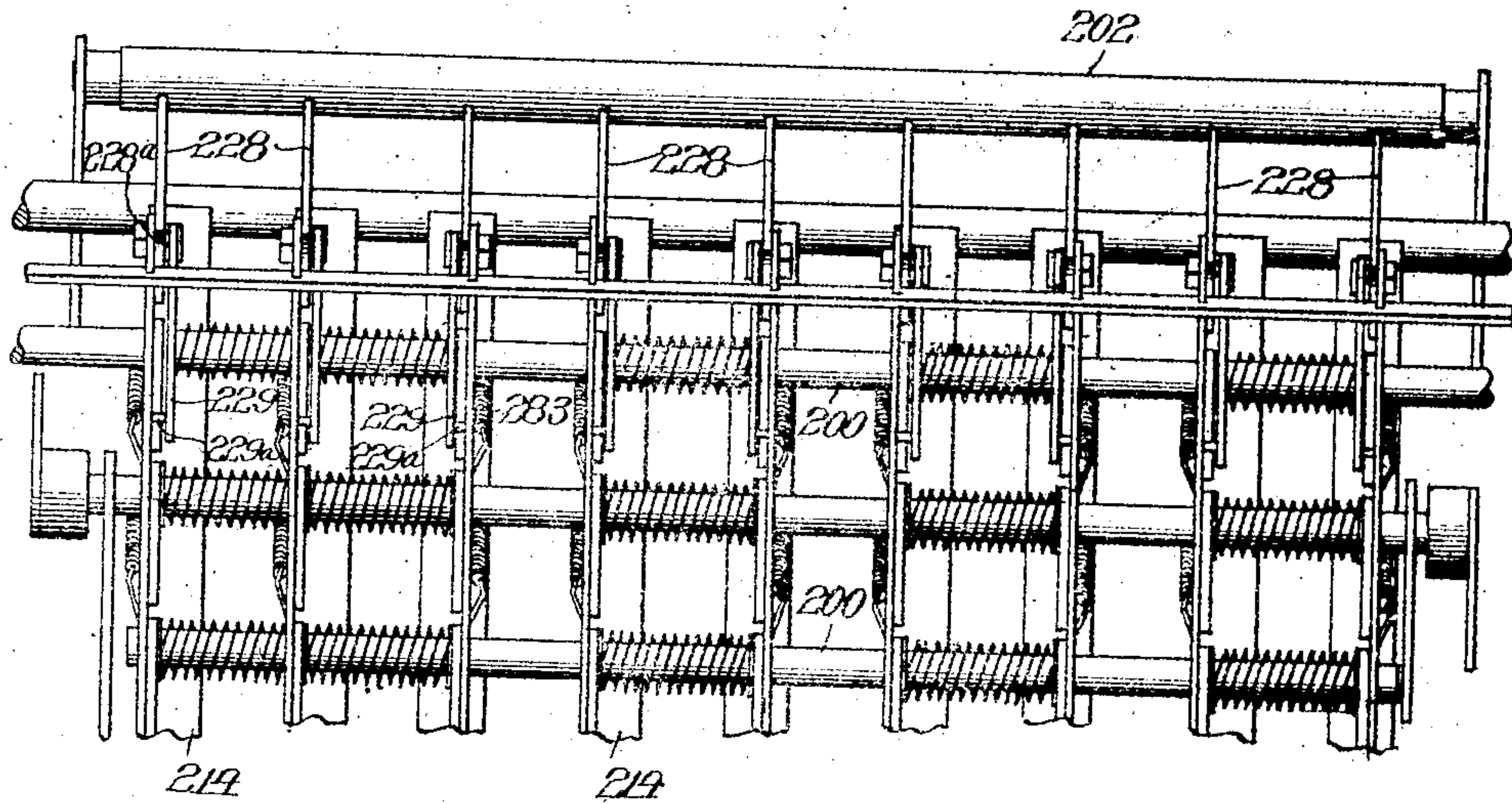
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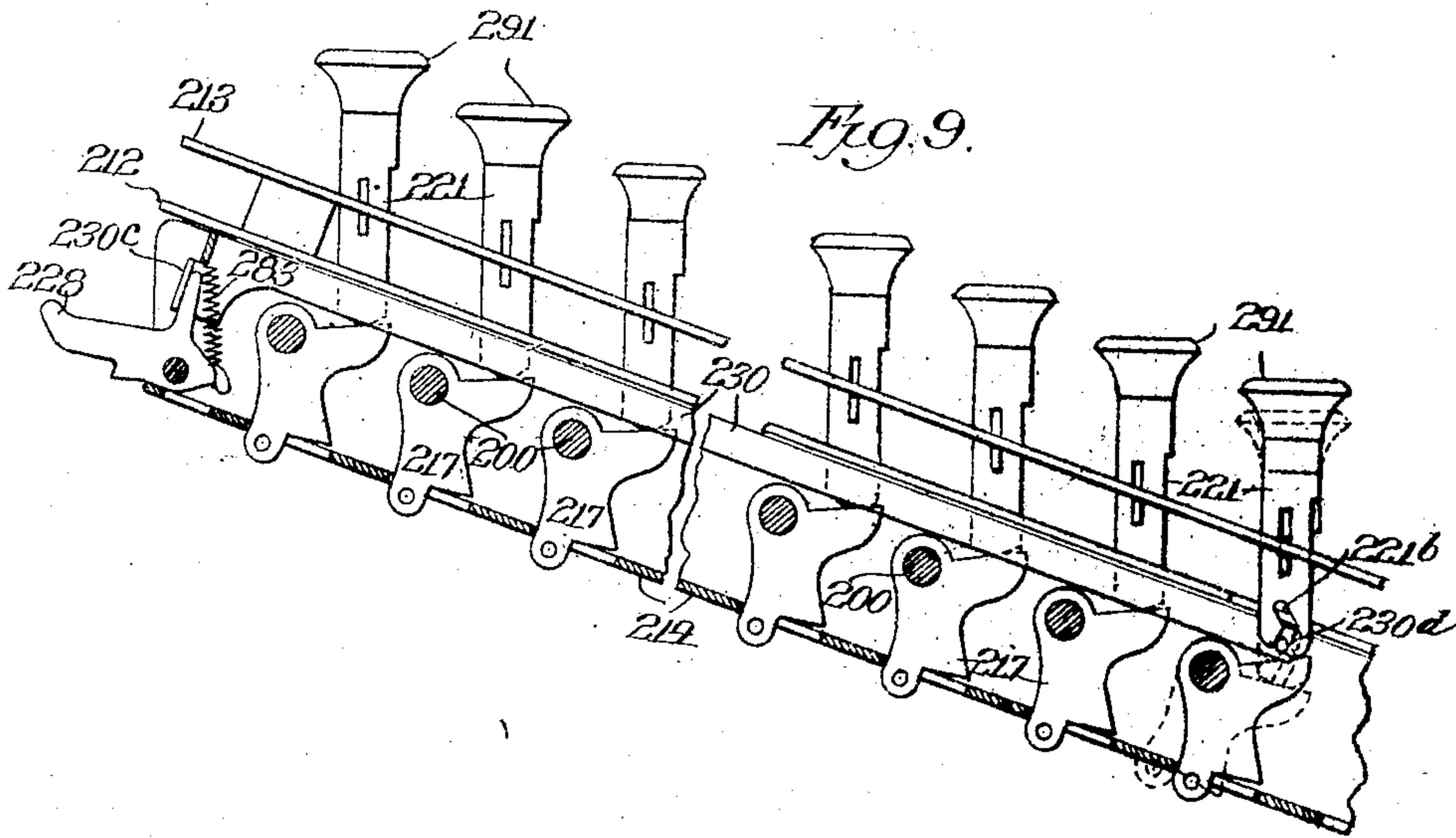
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4 SHEETS—SHEET 2.

*Fig. 4*



*Fig. 9.*



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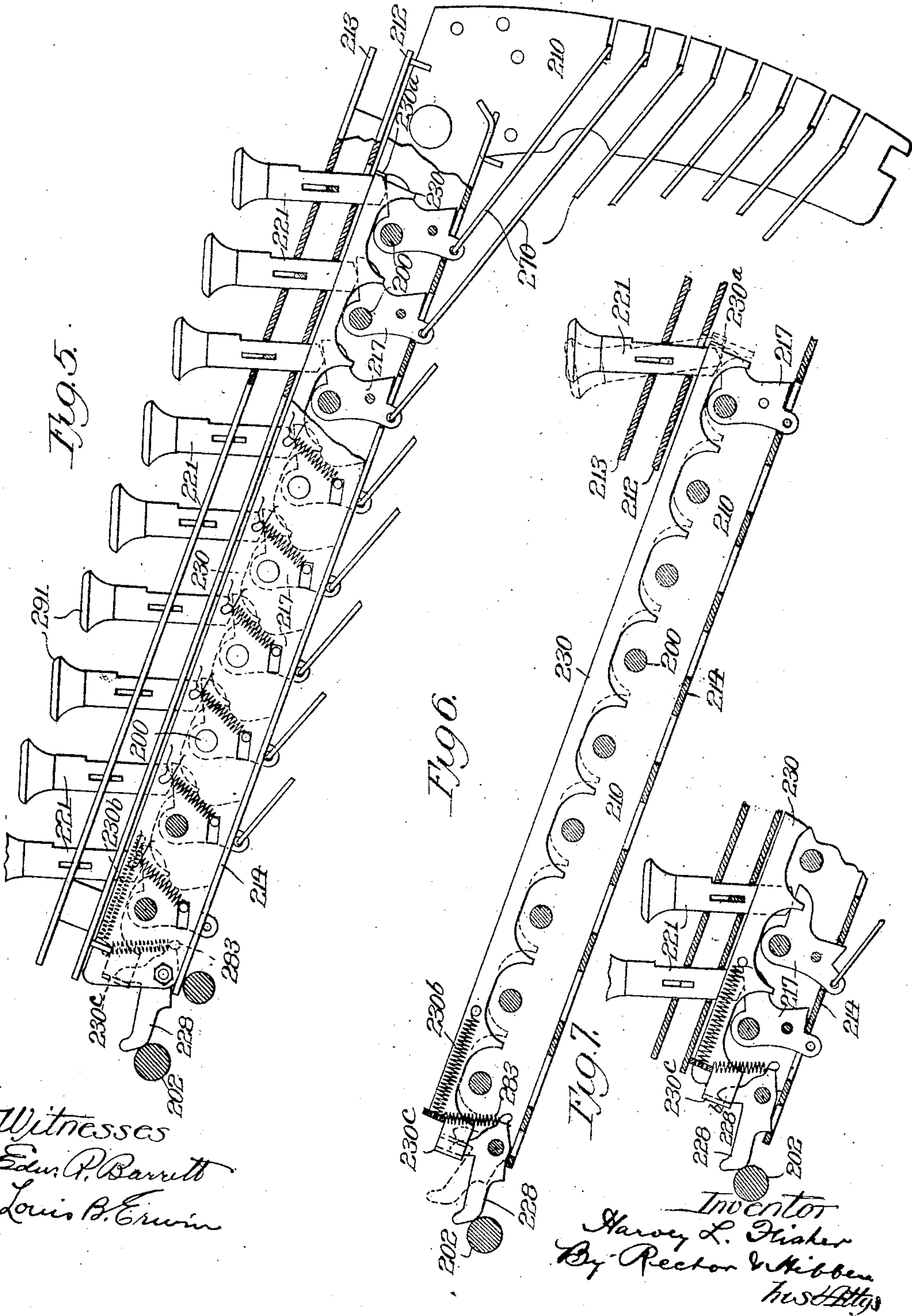
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4 SHEETS—SHEET 3.



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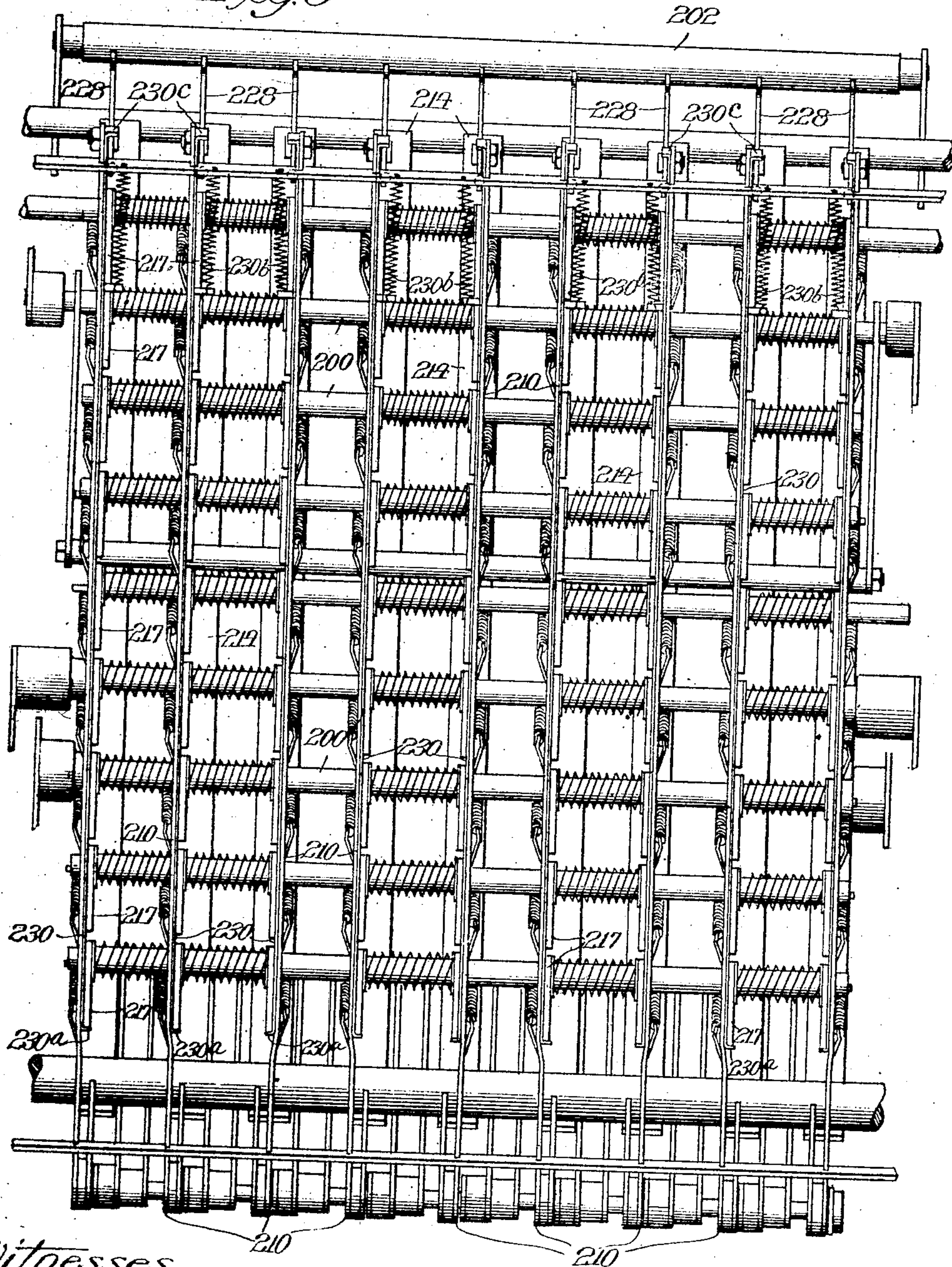
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4 SHEETS—SHEET 4.

Fig. 8



Witnesses

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# UNITED STATES PATENT OFFICE.

HARVEY L. FISHER, OF DETROIT, MICHIGAN, ASSIGNOR TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

## ADDING-MACHINE.

No. 899,965.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed June 30, 1905. Serial No. 267,811.

*To all whom it may concern:*

Be it known that I, HARVEY L. FISHER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

My invention relates to adding machines and the like adapted to print, list and add individual items and more particularly to the key mechanism thereof, and the object thereof is to provide means adapted to cooperate with mechanism for detaining an operated key and locking the remainder of the keys in its row or column against operation and arranged under the control of a predetermined one or more of the number or value keys for releasing any one of the keys in its row after it has been operated or depressed, with the result that in case a wrong key has been operated, the same may be released and permitted to be restored by simply operating or moving the predetermined value key or keys in the manner hereinafter explained. The setting of the keys and the release thereof is thus under the manual control of the operator, through the medium of the regular keys and without the employment of any additional keys, levers or the like for the purpose of releasing an operated key.

My invention is particularly applicable to the key mechanism of the type of machine exemplified in the Burroughs patents Nos. 504,963 and 505,078, issued on September 12, 1893 and in the present instance, for the sake of a clear and definite description of my invention, I have shown the same embodied in the well known Burroughs machine made in general accordance with said Burroughs patents, but it will be understood that my invention is applicable to machines of other types and other makes and that I contemplate using my invention wherever applicable. Moreover, while I have shown my invention in connection with a multiple key-bank type of machine, yet it will be understood that it is applicable to a single key-bank or so called 10-key machine. I will therefore proceed to describe my invention as applied to the well known Burroughs machine without intention of limiting my invention thereto, when viewed in its broader aspect.

In the drawings, Figure 1 is a side elevation of one section or train of the key mechanism with a portion broken away to expose the parts constituting my attachments or improvements; Figs. 2 and 3 detail views illustrating different positions of the operating parts; Fig. 4 a plan view of the key mechanism, with the keyboard proper and keys removed; Fig. 5 a view similar to Fig. 1, but illustrating a modified form of construction in which the resetting of the key is under the control of the "1" key; Figs. 6 and 7 detail views of such modification; Fig. 8 a plan view of a key mechanism embodying such modification, but with the keyboard removed, and Fig. 9 a detail view illustrating another modification.

As is well known, the Burroughs machine is of the multiple key-bank type having a plurality of rows of keys representing different denominations, increasing from right to left, each row representing the digits 1 to 9, the "1" keys being arranged at the forward end of the keyboard and the "9" keys at the upward or rearward end thereof. As shown more particularly in Fig. 1 of the drawings, the stems 221 of the number or value keys pass through suitable openings or slots in the keyboard plates 212 and 213 and are arranged to cooperate with a series of bell cranks 217 pivotally mounted upon the transverse rods 200. These bell cranks which are arranged on one side of the rearwardly extending portion of the plate 210 are operatively connected (with the exception of the bell crank corresponding to the "9" key) with a series of stop rods 270, whose forward ends work in slots in the plate 210 in the usual and well known manner. Each row of keys is provided with a sliding bar or strip 214, with which the bell cranks cooperate in such manner that when one key in the row of keys is operated, such bar is moved rearwardly from the position indicated in Fig. 1 to the position indicated in Fig. 2. When the bar has been moved rearwardly, as stated, it is retained in such shifted position by means of the pawl 228, which is spring-pressed by means of the spring 283, towards a position of engagement. It will be understood that after the bar 214 has been shifted rearwardly, by the depression of any one key in the row of keys, all the other



bell cranks and keys are locked against depression, inasmuch as the solid part of the bar is brought below the shoulders 217<sup>a</sup> of the bell cranks. In the regular operation of a Burroughs machine, the sliding bar or bars 214 which may have been operated in the listing and printing of an amount or item, are released by the forward swinging of the transverse rod or bell 202, which rocking thereof causes a movement of the pawls 228 in a clockwise direction and the consequent release and restoration of the bars 214. Moreover, in the ordinary Burroughs machine, the rod or pawl 202 is also under the control of the error key which, when operated, causes a similar movement or swinging of the rod or shaft 202 and the release and restoration of the sliding bars 214.

The parts just described are those which are employed in the well known Burroughs machine, in which machine, as usually constructed, the amount or item set up on the keyboard could not be corrected without restoring the entire key mechanism to normal position and setting up the entire item anew. The object of my present invention is to control the locking or detaining mechanism of the keyboard by a predetermined one or more of the number or value keys, preferably a single predetermined one thereof, for releasing or restoring the key which has been operated or depressed in its row of keys, with the result that in case a figure of an item or amount set up on the keyboard is wrong, the error may be corrected by simply operating the said predetermined value key in the row of keys in which said wrong figure occurs, so that the key, thus wrongly operated, is released and the keys of that row restored to permit the correct key to be operated, without the necessity of releasing all of the keys representing the item or amount and setting up the entire item anew. It will be understood that my invention contemplates the control of the key locking mechanism by a predetermined one or more of the value keys in each row of keys, and in Figs. 1 to 4, I have illustrated one form of construction in which such mechanism is under the control of the "9" key or keys, while in the remaining figures I have shown a construction wherein the mechanism is under the control of the "1" key or keys. It will be understood, however, as will be obvious after the following description, that any one or more of the keys in a row of keys may be chosen to control said mechanism, but the employment of either the "1" key or "9" key will be found the more convenient in practice.

Referring to the embodiment of my invention, as illustrated in Figs. 1 to 4 of the drawings, wherein the locking mechanism is under the control of the "9" key or keys, I provide a lever 229, which is in the form of a plate

pivoted upon the transverse rod 200, on which the bell crank 217, corresponding to the "9" key is hung, and position the same between such bell crank and the side of the rearwardly extending portion of the plate 210. This plate 229 is pivoted intermediate of its length, its rearwardly extending arm being provided with a lateral pin or stud 229<sup>a</sup> and the forwardly extending arm thereof with a lateral stud or pin 229<sup>b</sup>. The latter pin is in position to be engaged by a transverse slot 221<sup>a</sup> near the lower or inner end of the key stem of the "9" key, which key therefore has a pin and slot connection with the plate or lever 229. The other pin or stud 229<sup>a</sup> is arranged to cooperate with the pawl 228, corresponding to the row of keys being described, and for the purpose of controlling the same through the medium of the "9" key, such pawl 228 is made slightly different than heretofore by being provided with an upwardly extending cam surface 228<sup>a</sup>, which is arranged to cooperate with the pin or stud 229<sup>a</sup>. Normally this latter pin or stud is positioned at the base of the cam surface or extension 228<sup>a</sup>, as seen in Fig. 1, but in this clockwise movement, caused by a depression of the "9" key, the same is adapted to rock or swing the pawl 228 in the same way as the transverse rod 202, in the manner hereinafter explained.

When any one of the value keys is operated, assuming for example the "1" key, the bar 214 corresponding to that row of keys is moved or slid rearwardly and engaged and held in such rearward position by its pawl 228. If, now, before the machine is operated and before the item has been put into the machine and printed, the operator should discover that the "3" key, for instance, instead of the "1" key, should have been operated, he simply depresses the "9" key of that row of keys, with the result that the pin or stud 229<sup>a</sup> is swung upwardly by the movement of the plate 229 in a clockwise direction and the pawl 228 rocked upwardly or in a clockwise direction and the bar 214 thereby released. It will be understood that this depression of the 9 key for releasing purposes is slight, inasmuch as the shoulder 217<sup>a</sup> of its bell crank which, as usual, has a little play, soon comes in contact with and is stopped by the operated bar 214, but such movement is sufficient to swing or rock the pin 229<sup>a</sup> upwardly to a position to give the pawl 228 its greatest degree of movement, and to thereby release the operated bar 214 and permit it to be restored, as indicated in Fig. 3. Thus, whether the touch on the "9" key be light or heavy in this releasing operation, the movement of the key is always the same, inasmuch as such key can be depressed no further than sufficient to operate the pawl 228 for restoring action. In the regular



operation of the "9" key, the lever or plate 229 is rocked in a clockwise direction to its full extent and its pawl 228 is caused to be rocked upwardly and then permitted to drop to locking position with respect to the operated bar 214, as indicated in Fig. 2, at which time the pin or stud 229<sup>a</sup>, after passing the effective part of the cam surface 228<sup>a</sup>, has reached an upward position where the pawl 228 is permitted to be rocked by the tension of its spring 283 into locking engagement with the bar 214. Thus, while in the depression of the "9" key the pawl 228 is rocked away from locking position, it is permitted to return to that position at or before the bell crank 217 reaches its full operated condition, so that the bar 214 is engaged in the same manner as though one of the other value keys was operated.

In the event that the "9" key was depressed by mistake and it is desired to release that key, the operator simply pulls the key upwardly from the position indicated in Fig. 2, with the result that the lever or plate 229 is rocked in an anticlockwise direction and the pawl 228 released by contact of the pin or stud 229<sup>a</sup> against the effective part of the cam surface 228<sup>a</sup>, at which time the sliding bar 214, together with the bell crank 217 of the "9" key will return to normal position, whereupon the proper key of that row may be operated.

It will be seen from the foregoing description that the key release mechanism of each row of value keys is under the control of one of those keys, such controlling key in the preferred embodiment of my invention, being the "9" key, which may be operated in the usual manner, that is simply depressed, with the result that the operated key may be released, or if the "9" key is the one to be released the same may be restored by simply pulling it upwardly. Moreover, it is immaterial whether the touch on the controlling key be light or heavy, as it has a slight and limited amount of movement. However, as hereinbefore stated, the same general result can be accomplished in another manner and by the operation of a value key other than the "9" key, which modification will now be described.

Referring to the modification illustrated in Figs. 5 to 8, the key elements are the same as in the usual Burroughs machine as already described, but the key-release mechanism is under the control of the "1" key, for which purpose I provide an operating connection between such key and the pawl 228. As shown in the drawings, this connection comprises a sliding release bar 230, which is located and has its bearing against one side of the rearwardly extending portion of the plate 210 and near the upper edge of the latter and below the lower keyboard

plate 212. Ordinarily, the stems of the value keys have only sufficient opening in the keyboard plates 212 and 213 to permit of the straight up and down movement, but in the present instance I provide these openings or slots of sufficient length for the "1" key (or keys in case of a multiple key-bank type of machine) to permit the latter to be rocked rearwardly from the normal position indicated in full lines to the position indicated in dotted lines in Fig. 6. For the purpose of shifting the release bar 230 when the "1" key is rocked rearwardly as described, such bar is provided at its forward end with a laterally extending lug 230<sup>a</sup>, which is arranged in the path of the movement of the lower or inner end of the key stem of the "1" key, with the result that the release bar is shifted from its normal position, indicated in full lines to the shifted or dotted line position indicated in Fig. 6, whenever the "1" key is rocked rearwardly, this movement taking place against the tension of the spring 230<sup>b</sup>. The other or rearward end of the release bar 230 is arranged to cooperate with and to control the pawl 228 and for this purpose such end of the bar is provided with a lateral extension or lug 230<sup>c</sup> arranged in the path of movement of an upward extension 228<sup>b</sup> on the pawl 228. It is evident that upon the forward sliding of the release bar, its rearward end or lug 230<sup>c</sup> will engage the extension 228<sup>b</sup> of the pawl 228, and will rock the latter in a clockwise direction, with the result that in case the sliding bar 214 has been operated and retained by its pawl 228, the same will be released and be permitted to be restored to a normal position. The pawl 228 is thus rocked by the release bar to the dotted line position indicated in Fig. 6, in the same manner as rocked by the lever or plate 229, according to the first described construction. As soon as the pressure of the operator's finger on the "1" key is released, the release bar is restored to normal position by its spring 230<sup>b</sup> and the pawl 228 is restored to its normal position by its spring 283. In practice, assuming for example that an "8" key has been operated, as shown in Fig. 7, the bar 214 is shifted rearwardly and engaged by its pawl 228, but in the event that the operation of this key was an error, the operator simply rocks rearwardly the "1" key in the same row as the erroneously operated key and thereby causes a release of the pawl and a restoration of the different parts to the normal position, as indicated in Fig. 5, with the result that the correct key may be operated without restoring all of the operated keys on the keyboard. While, according to this particular construction, it is desired to employ the "1" key, yet it is obvious that the release bar 230 may be operatively connected with any one or more of the



value keys in the row of keys, so that such bar may be shifted by rocking one of the other value keys in such row.

The particular construction illustrated in Figs. 5 to 8 involve the rocking of the "1" key, but it is possible to control the proper operation of the release bar by the movement of the "1" key in the usual manner, that is by movement straight up and down, to which end the construction or modification illustrated in Fig. 9 may be adopted. According to this modification, the stem of the "1" key has a pin and slot connection with the release bar 230, the forward end lug being dispensed with. As shown in the drawings, the release bar is provided with a pin or stud 230<sup>a</sup>, while the stem 221 of the "1" key is provided with an angular slot 221<sup>b</sup>. Obviously, upon the first movement or depression of the "1" key the bar 230 is moved forwardly, owing to the oblique inclination of the lower end of the slot 221<sup>b</sup>, with the result that the pawl 228 is rocked upwardly when the "1" key is at or about its middle point of depression. After the upper end of the slot 221<sup>b</sup>, which is reversely inclined as compared with the lower end of the slot, is presented to the pin 230<sup>a</sup> the release bar and its pawl 228 are permitted to be restored to normal position, with the result that such pawl will lock the bar 214 in its position as operated or shifted by the "1" key. This describes the usual or full movement of the "1" key, but assuming that one of the other keys in the row of keys has been erroneously depressed and such key or its bell crank locked by the bar 214 and it is desired to release such operated key, the operator simply depresses the "1" key slightly, amounting practically to a half depression thereof, until the bar 230 is caused to be shifted forwardly in the manner explained, whereupon the pawl 228 is released from its engagement with the bar 214 and the latter, as well as the operated bell crank and the erroneously depressed key, permitted to be restored to normal position, after which the proper key may be operated or depressed. Thus, in all the forms herein illustrated and above described, the locking and detaining mechanism, which serves to detain the operated key of each row in depressed condition and to lock the remainder of the keys in such row in normal or raised condition and against operation, is under the control of a predetermined value key, with the result that by the operation of such key such mechanism may be actuated and an erroneously operated key permitted to be restored to normal, all the keys in that row then becoming normal, ready for the depression of the proper key.

I claim:

1. In an adding machine, the combination of a series of value keys, and means for de-

taining an operated key of such series in operated condition and simultaneously interposing an obstruction to the full operation of the remainder of the keys, independent movement of a key operating said detaining means to release any detained key and remove the obstruction to the operation of other keys.

2. In an adding machine, the combination of a row of value keys, and means for detaining an operated key of such row in operated condition and simultaneously interposing an obstruction to the full operation of the remaining keys of the row, independent movement of a key operating said detaining means to release any detained key and remove the obstruction to the operation of other keys of the row.

3. In an adding machine, the combination of a row of value keys representing the digits 1 to 9, and means normally operating to detain an operated key of such row and to interpose an obstruction to the full operation of the remainder of the keys, independent movement of the 9 key operating said detaining means to release any detained key and remove the obstruction to operation of other keys of the row.

4. In an adding machine, the combination with a series of value keys, of mechanism for detaining a key in operated condition and under the control of a single one only of said keys.

5. In an adding machine, the combination, with a row of value keys, of mechanism for detaining a key in operated condition and under the control of a single one only of the keys of said row of keys.

6. In an adding machine, the combination, with a row of value keys, of mechanism for detaining a key in operated condition and under the control of a predetermined one of the keys of said row of keys.

7. In an adding machine, the combination with a row of value keys representing the digits 1 to 9, of mechanism under the control of the "9" key for locking and retaining a key in operated condition and under the control of the "9" key alone.

8. In a multiple key-bank adding machine, the combination, with a plurality of rows of value keys of different denominations, of mechanism for detaining a key or keys in operated condition and under the control of a single one only of the keys of each row.

9. In a multiple key-bank adding machine, the combination, with a plurality of rows of value keys of different denominations, of mechanism for detaining a key or keys in operated condition and under the control of a single corresponding key only of each row of keys.

10. In a multiple key-bank adding ma-



chine, the combination, with a plurality of rows of value keys of different denominations, each row representing the digits 1 to 9, of mechanism for detaining a key or keys in  
5 operated condition and under the control of the "9" key only of each of the rows of keys.

11. In an adding machine, the combination, of a series of value keys, a locking bar cooperating with said keys, a pawl or detent  
10 for holding or detaining said bar in locking position, and an operating connection between said pawl and one of said value keys.

12. In an adding machine, the combination, of a series of value keys, a locking bar cooperating with said keys, a pawl or detent  
15 for holding or detaining said bar in locking position, and an operating connection between said pawl and the "9" key of said value keys.

20 13. In an adding machine, the combination, with a series of value keys, of mechanism for retaining a key in operated condition, means operated by a movable part of the machine for restoring said mechanism to  
25 normal position, and thereby releasing the operated key, and supplemental means under the control of one of said keys only for restoring said mechanism and releasing the operated key.

30 14. In an adding machine, the combination, with a plurality of rows of keys of different denominations, mechanism cooperating with each row of keys for retaining a key or keys in operated condition, means oper-  
35 ated by a movable part of the machine for restoring said mechanisms to normal position and thereby releasing at a single operation all the keys operated in the different rows, and supplemental means, one for each  
40 row of keys, for independently controlling the mechanisms of their respective rows of keys, said supplemental means corresponding to each row being under the control of one only of the keys of that row.

45 15. In an adding machine, the combination, with a series of value keys, of a shiftable bar cooperating therewith, a pawl or detent for detaining said bar in shifted or  
50 locking position, and a pivoted lever operatively connected with the pawl and the stem of one of said keys.

16. In an adding machine, the combination, with a series of value keys representing the digits 1 to 9, of a shiftable bar cooperating  
55 therewith, a pawl arranged adjacent the "9" key and adapted to detain said bar in shifted or locking position, and a pivoted lever operatively connected with the pawl and the stem of the "9" key.

60 17. In an adding machine, the combination, with a series of value keys, representing the digits 1 to 9, of a shiftable bar cooperating therewith, a pawl arranged adjacent the  
"9" key and adapted to detain said bar in

shifted or locking position, said pawl being  
65 arranged to rock and having a cam surface, and a pivoted lever operatively connected with the stem of the "9" key and arranged to cooperate with said cam surface to rock the  
70 pawl and thereby release the bar.

18. In an adding machine, the combination, with a series of value keys representing the digits 1 to 9, of a shiftable bar cooperating  
75 therewith, a pawl arranged adjacent the "9" key and adapted to detain said bar in shifted or locking position, and a pivoted lever operatively connected with the stem of the "9" key, said pawl being arranged to  
80 rock and having a curved cam surface contacted by said lever and of a contour to cause the pawl to be rocked away from and back again to engaging or detaining position.

19. In an adding machine, the combination, with a series of value keys representing the digits 1 to 9, of a shiftable bar cooperating  
85 therewith, a pawl arranged adjacent the "9" key and adapted to detain said bar in shifted or locking position, and a pivoted lever operatively connected with the stem of the "9" key and having a pin or stud, said  
90 pawl being arranged to rock and having a curved cam surface in the path of movement of said pin and of a contour to cause the pawl to be rocked away from and return to engaging or detaining position.  
95

20. In an adding machine, the combination, with a series of value keys representing the digits 1 to 9, of a shiftable bar cooperating  
100 therewith, a pawl arranged adjacent the "9" key and adapted to detain said bar in shifted or locking position, and a lever pivoted intermediate its length and at one end operatively connected with the stem of the  
105 "9" key and at its other end having a pin or stud, said pawl having a curved cam surface in the path of movement of said pin or stud and of a contour to cause the pawl to be  
rocked away from and returned to engaging or detaining position.

21. In an adding machine, the combination, with a series of value keys representing the digits 1 to 9, of a shiftable bar cooperating  
110 therewith, a pawl arranged adjacent the "9" key and adapted to detain said bar in shifted or locking position, and a lever pivoted intermediate its length and at one end  
115 having a pin and slot connection with the lower end of the "9" key and at its other end having a stud, said pawl having a cam surface in the path of movement of said stud, whereby the pawl is controlled by said lever  
120 and said "9" key.

22. In a machine of the character described, a series of independently depressible  
125 keys, a detent common to said keys for holding any one of the same depressed, and means for locking other keys against depression while any one of them remains depressed



and so held by said detent, with provisions for displacing the detent and unlocking the keys by limited manipulation of one of them.

23. In a machine of the character described, a series of independently depressible keys, and means for automatically locking a depressed key against returning and locking the remaining keys against depression, with

provisions for releasing the depressed key and unlocking the other keys by limited manipulation of one of them. 10

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