H. M. HARRISON.

ADDING MACHINE.

APPLICATION FILED JUNE 25, 1914.

1,214,030.

Patented Jan. 30, 1917.

3 SHEETS—SHEET 1.

Fig. 1a

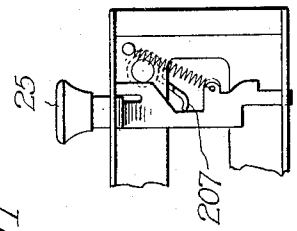
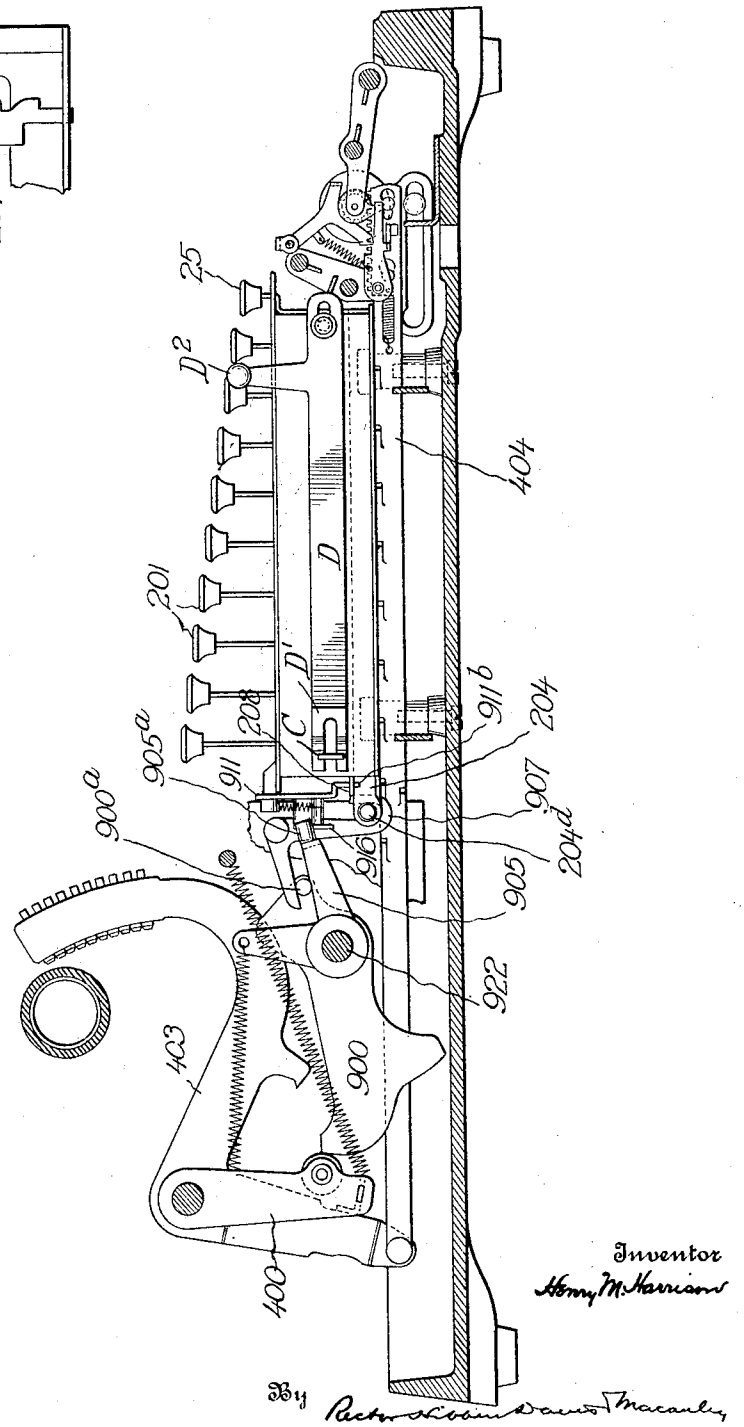


Fig. 1



Witnesses

E. R. Barrett

Robert Dobberman

Inventor

Henry M. Harrison

By Pacton & Gibbs Davis & Macauley

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

H. M. HARRISON.

ADDING MACHINE.

APPLICATION FILED JUNE 25, 1914.

1,214,030.

Patented Jan. 30, 1917.

3 SHEETS—SHEET 2.

Fig. 2.

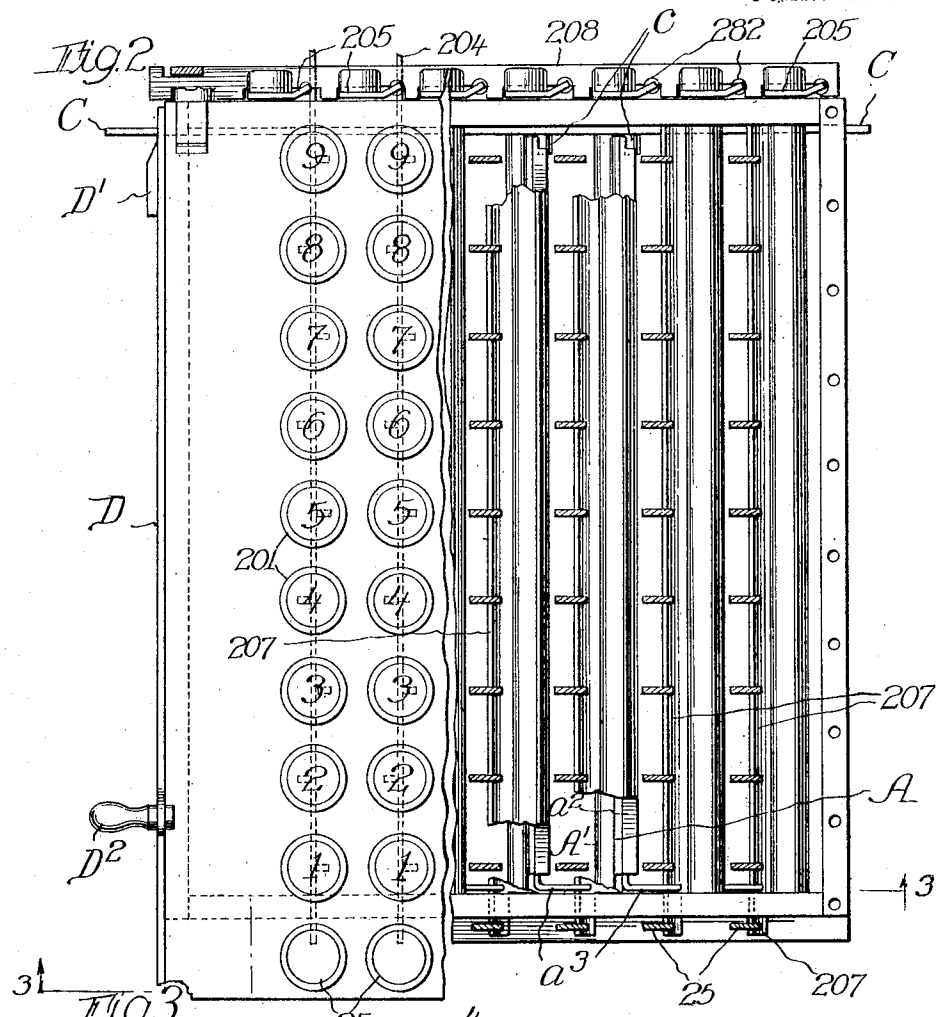
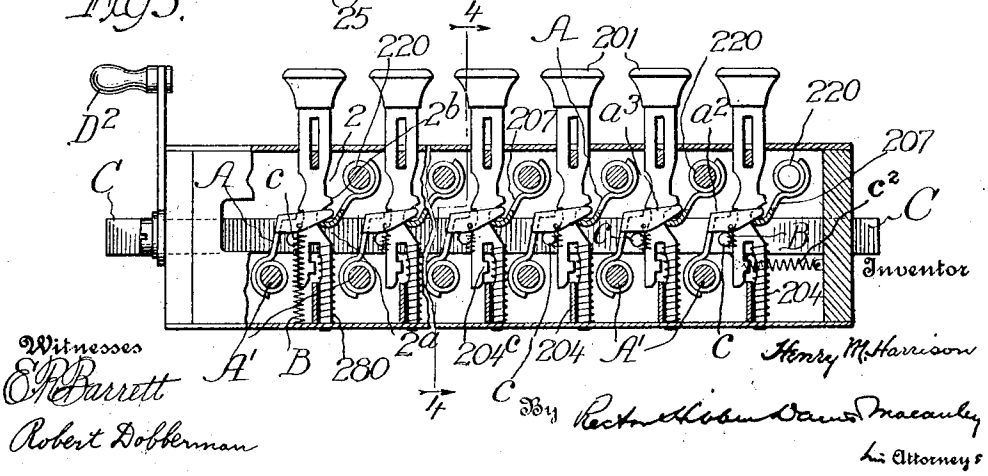


Fig. 3.



THE NORRIS PETERS CO., PHOTO LITHO., WASHINGTON, D. C.

H. M. HARRISON.

ADDING MACHINE.

APPLICATION FILED JUNE 25, 1914.

1,214,030.

Patented Jan. 30, 1917.

3 SHEETS—SHEET 3.

Fig. 4

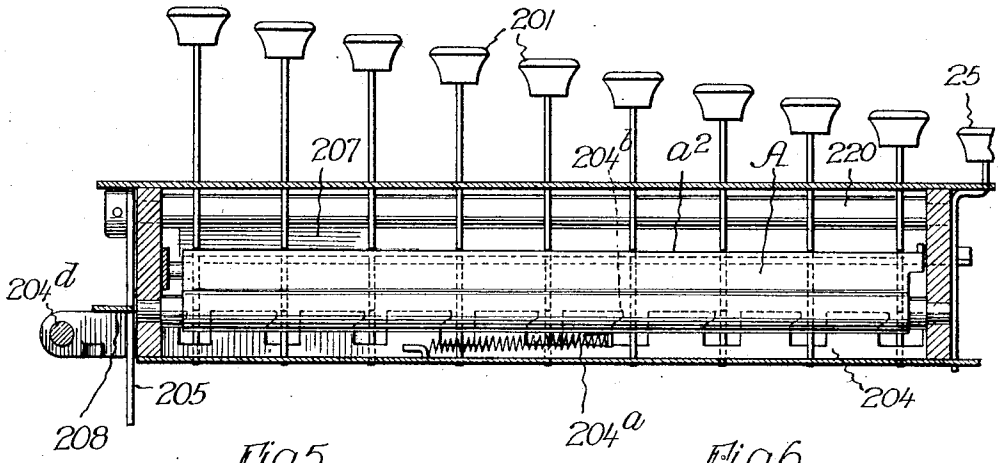


Fig. 5

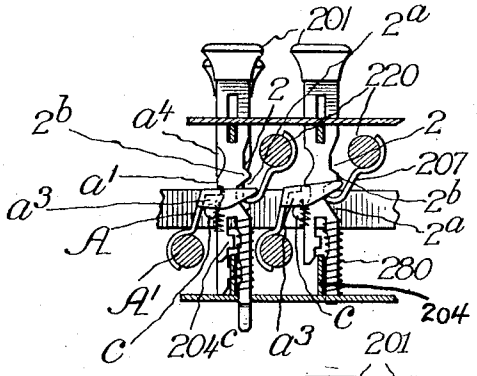


Fig. 6

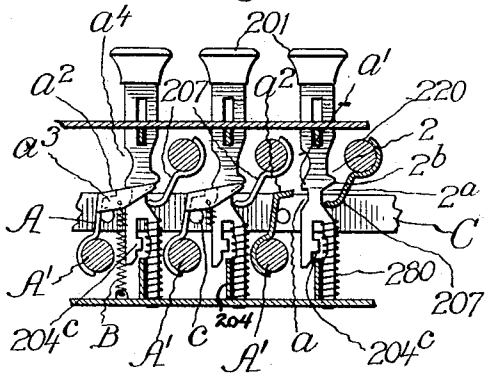
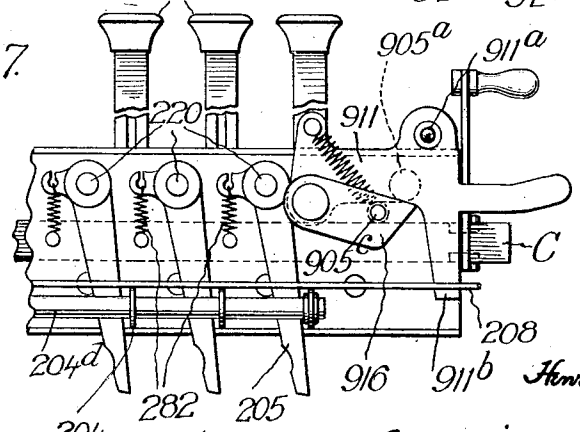


Fig. 7



Witnesses

E. R. Barrett

Robert Dobberman

Inventor

Henry M. Harrison

By Rector Abbott Davis & Macauley

his Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY M. HARRISON, OF DETROIT, MICHIGAN, ASSIGNOR TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

ADDING-MACHINE.

1,214,030. Specification of Letters Patent. Patented Jan. 30, 1917.

Application filed June 25, 1914. Serial No. 847,223.

To all whom it may concern:

Be it known that I, HENRY M. HARRISON, 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.

The present invention relates to the keyboard of adding machines and the object is to provide a keyboard which is convertible at the will of the operator from "flexible" to "locked" condition. It will be understood that there are two well-known types of keyboards employed in machines of this character, in one of which the depression of a key releases a previously depressed key, and in the other of which the depression of a key results in locking out all of the other keys of the series. The former type is commonly known as a "flexible" keyboard. The latter type is commonly known as a "locked" keyboard. Operators of these machines become accustomed to one type or the other, and when given a new machine which happens to have a different type of keyboard from the one to which a user has been accustomed, he usually finds himself at a disadvantage in executing his work with his accustomed speed and dexterity.

The object of my invention is to put it in the power of the user of the machine to have the keyboard "flexible" or "locked". It will be obvious that this has the advantage, aside from that above stated, of better fitting the machine for use of different operators in the same establishment, besides which the flexible keyboard may be better adapted to some classes of work than the locked keyboard, and vice versa.

In the accompanying drawings, which form part of this specification, I show my invention applied to a well-known type of machine, to wit, a machine known on the market as the "Burroughs Visible", and reference may be had to Patent 763,692 issued June 28, 1904, on the invention of William H. Pike, Jr., for the general design of this machine.

Figure 1 of said drawings shows such machine in left side elevation without the casing and with the base casting in section and certain cross shafts and rods also in section; Fig. 1[a] is a detail front elevation of a small portion of the keyboard; Fig. 2 shows the keyboard in top plan view as to a lefthand portion and in horizontal section as to the balance; Fig. 3 is a partial front elevation of the keyboard and a partial vertical section substantially on line 3—3 of Fig. 2; Fig. 4 is a vertical section taken from front to rear substantially on line 4—4 of Fig. 3; Figs. 5 and 6 are fragmentary views on the order of Fig. 3, showing different conditions, and Fig. 7 is a fragmentary rear elevation of the keyboard.

In view of the familiar character of the machine proper to which I here show my invention applied, it will be unnecessary to enter into a detailed description thereof, and I shall simply designate a few of the familiar parts. Reference numeral 404 designates rack-carrying bars coupled at their rear ends to type-carrying levers 403 and normally held rearward by bail 400 with which engages cam 900, the latter being secured to a main drive shaft 922. The amount keys are designated by the numeral 201 and are arranged as usual in several rows running from front to rear. These keys operate as usual when depressed to unlatch the bars 404 and set stops therefor, so that when the machine is then operated and the cam 900 swung upwardly and the bail 400 is drawn forward by its spring, the bars 404 will advance and such of them as are associated with rows of keys wherein keys have been depressed, will advance until stopped by these keys.

In the machine of the type above referred to it is customary to employ the flexible type of keyboard and I shall next point out devices here shown which correspond with those commonly employed in that type of machine for the purpose of latching down a depressed key and effecting release thereof by depression of another key in the same row.

Referring more especially to Figs. 3, 5 and 6, each key stem 202 is formed in the right-hand side with upper and lower notches 2 and 2[a] leaving a detent projection 2[b] between them, which projection is beveled on the under side for camming coöperation with a detent blade or shutter 207. The latter extends along the entire series of keys, being secured to a rock shaft 220 which is journaled in the front and rear walls of the keyboard.

Referring next to Fig. 7, a spring 282 applied to a lateral branch of a downwardly extending arm 205 connected to the shaft 220, normally holds the acting edge of the blade or shutter in the lower notches 2^a of the series of key stems, as shown in Figs. 3, 5 and 6. Springs 280 encircling legs of the key stems normally uphold the keys. Depression of a key results in the inclined under edge of its detent projection 2^b displacing the shutter and as the limit of key depression is reached the projection 2^b passes by the shutter and the latter springs over it and latches the key down. Obviously depression of another key in similarly displacing the shutter will release the first depressed key.

Passing now to the special equipment supplied by my invention for establishing a "locked" condition of the keyboard, and referring to the same figures of the drawings, I employ for each series of keys a locking blade or shutter A located on the opposite side of the key stems from the regular shutter 207, and I form in the lefthand side of the keystems notches a with abrupt upper sides a' to coöperate with a substantially right angled flange a^2 of the said blade or shutter A. The latter is secured to a rock shaft A′ which is journaled in the front and rear walls of the keyboard and at its front end the shutter is formed with a finger a^3 which projects over the acting edge of the associated shutter 207. A spring B connects this finger with the bottom plate of the keyboard and thus tends to engage the shutter with the key stems. The spring 282 applied to the regular shutter 207 is, however, superior to this spring B and therefore restrains it through engagement of the edge of the shutter 207 with the under edge of the finger a^3. Thus, as illustrated in Fig. 3, the right-angled flanges a^2 of the locking shutters will normally be held clear of the shoulders a' of the key stems.

It will be clear from the above that on depression of a key of any series and the consequent displacement of the shutter 207, the spring B of the associated locking shutter will be released from restraint and will throw its shutter into engagement with the stems of the balance of the keys in the series, thereby locking them against depression, as illustrated in Fig. 5 where one key of the lefthand series is shown depressed. In order to accommodate this movement of the locking shutter notwithstanding depression of a key, the key stems are notched in their lefthand sides above the notches a as shown at a^4, and it will be noted in Fig. 5 that the flange of the locking shutter has entered the upper notch of the depressed key.

In order to prevent such action as last above described and to therefore maintain a flexible condition of the keyboard, I provide for restraining the locking shutters so that upon depression of a key they will not move. To this end I mount a cross bar C at the rear portion of the keyboard so as to extend across the rear ends of said shutters, and this bar carries a series of forwardly projecting studs c, one for each of the shutters, and adapted to engage the righthand sides thereof. This cross bar C is capable of maintaining two positions in one of which (the righthand position, Figs. 3 and 5) the studs c do not interfere with the action of the locking shutters and consequently a "locked" condition of keyboard exists. In the other or lefthand position of the cross bar, as shown in Fig. 6, the studs restrain the locking shutters preventing the coöperative action between them and the regular shutters 207 which, under the other condition, results in the locking out of unoperated keys. A spring C^2 (Fig. 3) holds the bar normally to the right. As a convenient means for shifting the said cross bar C I mount along the lefthand side of the keyboard a slide bar D which is bifurcated at its rear end to embrace a notched portion of the cross bar C as illustrated in Fig. 7, and I mount upon this slide bar D a bifurcated cam block D′. When the slide bar D is forward, as shown in Figs. 1 and 2, the cam block is clear of the cross bar C and the springs B are free to throw the locking shutters to effective position upon depression of amount keys. Rearward thrust of the slide bar D causes its cam block to act against the left side of the notches in the cross bar C and force said bar to the left, thereby engaging its stud c with the locking shutters and preventing them from acting. For convenience of manipulation the slide bar D is formed with an upwardly projecting branch near its forward end to which branch a handle D^2 is applied.

It will be seen that the above described construction fully attains the object primarily stated, though it is to be understood that considerable modification is possible within the scope of the invention.

As to locking of keys during an operation of the machine, that is accomplished as heretofore through notched locking bars 204, Fig. 4, to which springs 204^a are applied tending to engage fingers 204^b of said bars with lugs 204^c of the key stems which are bifurcated to straddle these locking strips or bars. The latter are connected at their rear ends by a cross rod 204^d which as shown in Fig. 1 is embraced by the hook-shaped lower arm of the bell crank lever 907 whose rearwardly extending arm overlies a stud 900^a on the operating cam 900. It will be seen that the engagement of this stud with the bell crank normally restrains the locking strips or bars but that with the commencement of an operation of the ma-

chine they will be released and will be moved forward by their springs so as to lock down any operated keys and lock out all unoperated keys.

The automatic unlatching of depressed keys as an operation of the machine terminates is likewise done in a familiar manner. Thus the aforesaid shutter arms 205 occupy elongated notches of a horizontal slide strip 208 which is also engaged by the depending arm 911[b] of a bell crank 911 pivoted at 911[a], Fig. 7, and carrying a pivoted spring-held wiper plate or pawl 916. An arm 905, Fig. 1, secured to the shaft 922 carries a roller 905[a] normally standing just above the said wiper pawl. As the operation of the machine starts this roller displaces said pawl and passes by the same without affecting the bell crank 911, but as the operation of the machine terminates the said roller acts against an under edge of the pawl and rocks the bell crank 911 to shift the strip 208 and unlatch any depressed keys, said pawl having a stud 905[a] which underlies the horizontal arm of the bell crank.

For effecting release of an erroneously depressed key in any one column, without putting down another key, there is provided a special key 25 at the front of the keyboard in line with each row or series of keys, which special key is notched as shown in Fig. 1[a] to receive a forward extension of the associated shutter 207. Obviously depression of any one of these special keys will release a depressed key in the alined series of amount keys.

I claim:

1. The combination of depressible spring-sustained keys; detent-means for detaining them singly when depressed, with provisions for releasing one key by depression of another; and locking means normally withdrawn through engagement with said detent means and adapted upon depression of a key to lock out other keys, with provisions for disabling said locking means at will whereby to permit release of one key by depression of another.

2. The combination of depressible spring-sustained keys; spring-actuated detent-means for detaining them singly when depressed, with provisions for releasing one key by depression of another; and spring-actuated locking means normally withdrawn through engagement with said detent means and adapted upon depression of a key to lock out other keys, with provisions for disabling said locking means at will whereby to permit release of one key by depression of another.

3. The combination of depressible spring-sustained keys having detent and lock projections; a spring-actuated shutter adapted to be displaced and to engage over the detent projections; an inferiorly spring-actuated shutter to engage under the lock projections but normally restrained by the first-mentioned shutter; and manipulating means for permanently restraining the lock-shutter.

4. The combination of depressible spring-sustained keys having detent and lock projections; a spring-actuated shutter adapted to be displaced and to engage over the detent projections; an inferiorly spring-actuated shutter to engage under the lock projections but normally restrained by the first-mentioned shutter; and a manipulative slide for permanently restraining the lock-shutter.

5. The combination of depressible spring-sustained keys having detent and lock projections; a spring actuated shutter adapted to be displaced and to engage over the detent projections; an inferiorly spring-actuated shutter to engage under the lock projections but normally restrained by the first-mentioned shutter; a slide adapted to engage and permanently restrain said lock-shutter; and a manipulative slide for shifting the first-mentioned slide.

6. The combination of several parallel rows of depressible spring-sustained keys having detent and lock projections; a spring-actuated shutter for each row adapted to be displaced by and to engage over the detent projections; an inferiorly spring-actuated shutter for each row of keys adapted to engage under the lock-projections thereof but normally restrained by the detent shutter associated with the same row of keys; a transversely extending slide common to the several lock-shutters and shiftable to engage and detain them all out of position to lock the keys; and means for shifting the slide.

HENRY M. HARRISON.

Witnesses:
R. W. FAIRCHILD,
R. S. MIELERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."