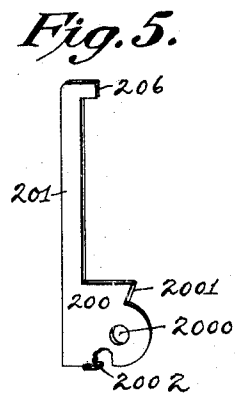
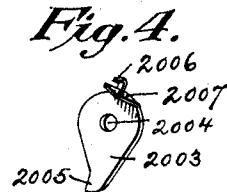
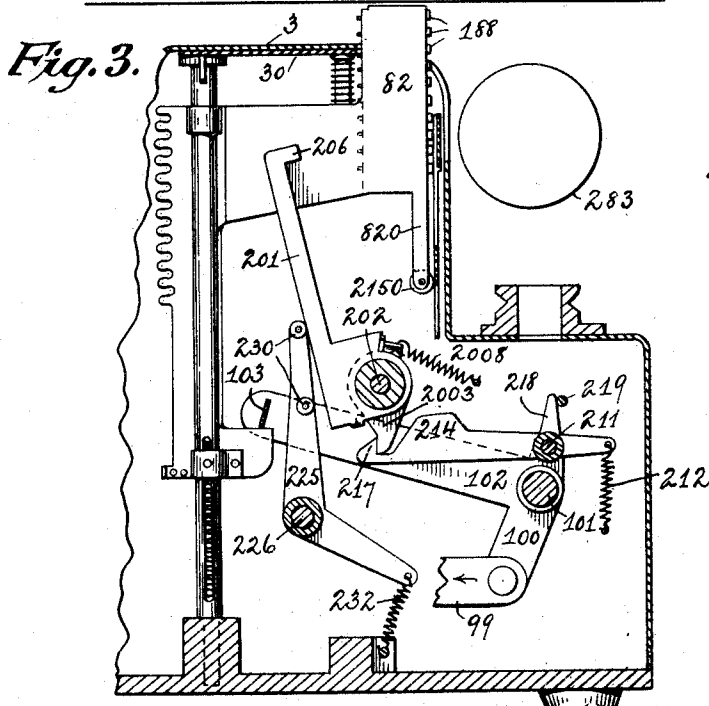
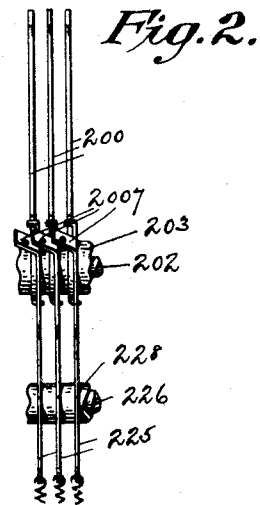
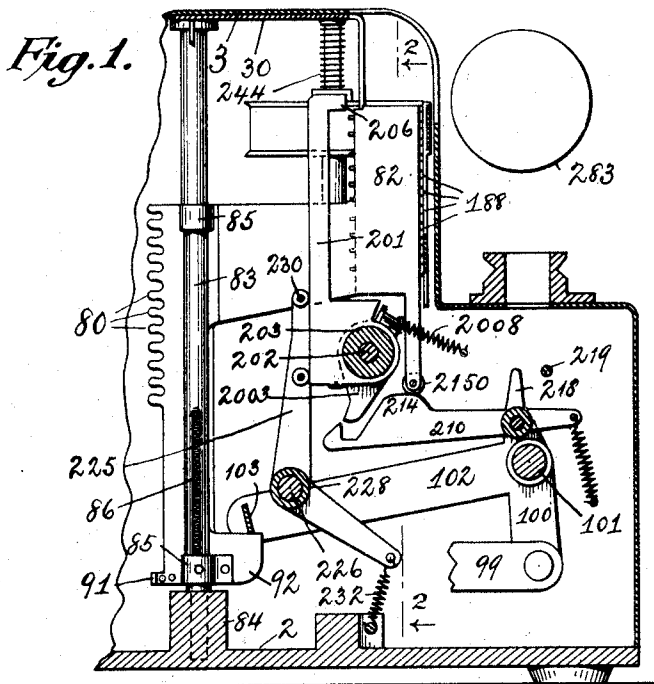


J. C. LOTTERHAND.
 PRINTING MECHANISM FOR ADDING MACHINES.
 APPLICATION FILED MAR. 20, 1909.

985,042.

Patented Feb. 21, 1911.



Attest:
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UNITED STATES PATENT OFFICE.

JASON C. LOTTERHAND, OF NEW YORK, N. Y.

PRINTING MECHANISM FOR ADDING-MACHINES.

985,042.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed March 20, 1909. Serial No. 484,665.

REISSUED

To all whom it may concern:

Be it known that I, JASON C. LOTTERHAND, a citizen of the United States, and resident of New York city, State of New York, have invented certain new and useful Improvements in Printing Mechanisms for Adding-Machines, of which the following is a specification.

This invention relates to printing mechanisms of adding machines and its novelty consists in the construction and adaptation of the parts as will be more fully hereinafter pointed out.

In a co-pending application for Letters Patent of the United States, filed June 25, 1908, Serial No. 440,399, I have described and claimed a printing mechanism for adding machines upon which this invention is an improvement and of which it is a modification.

In the drawings, Figure 1 is a vertical section and partial side elevation of one part of an adding machine embodying the invention; Fig. 2 is a rear elevation of the type actuators and their energizers; Fig. 3 is a view similar to Fig. 1 showing an actuator partly drawn back by its trigger; Fig. 4 is a detail of the catch plate, and Fig. 5 is a detail of the body of the type actuator.

In the drawings, 2 is the base and 3 is the casing of the machine. It is provided with a suitable key system and actuating mechanism (not shown) whereby items are enumerated on the key board by depressing the keys and numeral wheels are rotated at each actuation of a main shaft to an extent corresponding with the several keys depressed in a manner well known in the art.

The machine is provided with a series of rack and type plates 81, each provided at its front edge 80 with a rack and at its rear edge with a wing 82 adapted to carry the types 188. A downwardly projecting extension 820 is provided for each wing and it terminates in a roller 2150. Vertical rods 83, resting in recesses formed in transverse ribs 84 at the base of the machine and the upper ends of which engage a transverse plate 30 at the top of the casing 3, serve as guides and supports for the rack and type plates. Each plate is provided with two guides 85 serving to retain the plate in engagement with its rod. The rods 83 are hollow and each contains a spring 86 by which the plate 81 is normally raised against the force of gravity. Each plate is provided at

the lower part of its front edge with a projection 91 and at the lower part of its rear edge with a projection 92 adapted to be engaged by a transverse restoring bar indicated in section at 103. In general it may be said that the numeral wheels (not shown) are provided with pinions which engage with the racks 80 and when the numeral wheels are rotated in the enumeration of an item the plates 81 are raised so as to bring the proper type of the series opposite the point of print on the platen indicated at 283.

The types 188 are arranged in a little frame or housing on the wing 82 of the plate 81 and are provided with springs (not shown) whereby they may each be retracted to position after having been propelled toward the point of print.

Type actuators 200 are arranged in front of the types, one for each denominational series. They each comprise a body 201 provided with an aperture 2000 by which it is loosely mounted on a common shaft 202 and they are spaced apart by collars 203. Each body is provided with a striker 206, with a shoulder 2001 and with an ear 2002 intumed at its lower edge. Mounted on the same shaft 202 and adjacent to each type actuator is a catch plate 2003 having an aperture 2004, a catch tip 2005, an upper inwardly projecting flange 2006 and an arm 2007 extending toward the body of the actuator of next lower order. A spring 2008 secured to the arm 2007 and to a convenient part in the machine serves to retract the catch plate to position after it has been moved.

Arranged in the rear and below the type actuators are a series of triggers 210 each loosely mounted on a common shaft 211 and spaced apart by collars. Each trigger is provided with a spring 212, the other end of which is secured to a cross rod 199 conveniently mounted in the machine. Each trigger has an upwardly extending member 214 adapted to engage with the roller 2150 on the extension 820 of the appropriate type plate. It also has a hook 217 adapted to engage with the tip 2005 of the catch plate 2003 and a projection 218 adapted to strike against a cross rod 219 suitably mounted in the machine for that purpose. The shaft 211 is mounted between two arms 102 forming extensions of elbow levers 100, hereafter referred to. By this construction, while each of the triggers 210 moves on the shaft 211, the entire series of triggers and this shaft

moves as a whole as the elbow levers are moved.

Arranged in front and below the parts just described are energizing elbow levers 225, each loosely mounted on a cross shaft 226 suitably supported from the base of the machine and spaced apart by collars 228. The upper arm of each lever is provided with rollers 230 adapted to engage the front edge of the actuators 200. The lower arm of each lever is provided with a spring 232 secured to a suitable fixed point.

101 is a transverse shaft supported in suitable bearings in the frame and 100 is one of a pair of elbow levers, one being mounted on each side of the machine. Between the upper arms of these levers is arranged the restoring bar 103. A long bar 99 connects the lower end of each elbow lever with the main shaft. Arms 102 project upwardly from each of these levers and between them is carried the shaft 211, above referred to.

Supposing an item to have been enumerated by the depression of the appropriate keys. The main shaft is then oscillated. This moves the bars 99 and elbow levers 100 and lifts the restoring bar. The appropriate rack and type plates 81 are thus permitted to rise under the influence of their respective springs until the proper type is brought into position at the point of print corresponding to the keys which have been depressed. All of the remaining plates 81, whose keys have not been depressed, rise a slight distance to bring their respective "0" type to the point of print. As each plate 81 rises its extension 820 rises and the trigger 210 follows under the influence of its spring 212, the member 214 of the trigger remaining in contact with the tip 2005 on the plate 2003. The trigger oscillates the catch plate on the shaft 202 until the flange 2006 of such plate contacts with the shoulder 2001 on the actuator 200 and the catch plate and actuator thereafter move together. As the elbow levers 100, 102, move and rotate on the shaft 101, and the actuators are rocked forward, their front edges press against the roller 230 on the energizers 225 and tilt the latter against the tension of their respective springs 232. As the rotation of each trigger around the shaft 211 continues, its projection 218 finally strikes the rod 219 and causes the hook 217 to be disengaged from the catch 2005 whereupon the energizing elbow lever 225 smartly propels the actuator and its striker 206 against the proper type to move the latter against the platen, the spring 2008 at once drawing the catch plate backward until its front edge impinges against the ear 2002 of the actuator 200 when its further movement in that direction will be arrested.

In the form of mechanism described in the copending application for a patent above

referred to, arms corresponding to the arms 2007 are shown mounted directly upon the actuators themselves. When, therefore, an item was enumerated, which involved the printing of a number "0" for instance 80008 the arm on the actuator in the 5th column did not contact with the actuator in the 4th column for an instant after it was moved and similarly its arm did not contact with the actuator in the 3rd column for an instant after it was moved and these small periods of lost time being added together across the machine the printing of the zero was successive rather than simultaneous, and while it was operative it was not as efficient as might be desired.

In the form of mechanism just described, there is no such lost motion between the arm of one actuator and the next actuator because the flange 2006 on each catch plate 2003 is always in contact with the arm 2007 of the catch plate of next higher order, and when an item involving zeros is enumerated as for instance 80008 none of the actuators are moved at all against their energizers until the catch plate in the 5th column has moved to contact with its actuator, and when this has happened it will be found that all of the catch plates have been similarly moved to contact with their several actuators and the latter move simultaneously and as a unit.

The construction above described affords a ready means for varying the power of the stroke of the hammer. It is obvious that by lengthening the arm of the elbow lever 225 on which the rollers 230 are mounted without moving the center on which it oscillates, it will require much more energy to move the elbow 225 forward against the power of its spring and the propelling stroke against the actuator will be that much stronger.

What I claim as new is:—

1. In a machine of the character described, comprising printing actuators and their energizers, each actuator being provided with an arm extending into the plane of the actuator of next higher order, means for simultaneously moving all of the actuators, comprising a separable catch plate provided with a flange adapted to engage the rear edge of the actuator.

2. In a device of the character described, the combination with a shaft and a type actuator loosely mounted thereon, of a co-operating catch plate loosely mounted on the same shaft and means for limiting its movement with respect to the actuator, consisting of a flange on the actuator adapted to be engaged by the edge of the catch plate and a flange on the catch plate adapted to be engaged by the edge of the actuator.

3. In a device of the character described, a shaft, a denominational series of type actuators loosely mounted thereon, and a se-

ries of cooperating catch plates, one for each actuator, each catch plate having a tip adapted to be engaged by a trigger and an arm extending into the plane of the plate of next lower order.

4. In a device of the character described, a shaft, a denominational series of type actuators loosely mounted thereon, and a series of cooperating catch plates, one for each actuator, each catch plate having a tip adapted to be engaged by a trigger and an arm extending in to the plane of the plate of next lower order, in combination with means adapted to cause each catch plate to engage its actuator after a limited movement in a vertical plane.

5. In a device of the character described, a shaft, a denominational series of type actuators loosely mounted thereon, and a series of cooperating catch plates, one for each actuator, each catch plate having a tip adapted to be engaged by a trigger and an arm extending into the plane of the plate of next lower order, in combination with means adapted to cause each catch plate to engage its actuator after a limited movement in a vertical plane, comprising a flange on the catch plate adapted to contact with the actuator after such movement.

6. A printing mechanism for an adding machine comprising a shaft and a type hammer having a body loosely mounted thereon, provided with a striking tip and having a flange extending toward the hammer of next lower order.

7. A printing mechanism for an adding machine comprising a type hammer energizer consisting of an elbow lever provided with a plurality of rollers arranged along its upper arm.

8. In a device of the character described, a type hammer, means for tilting it backward, comprising a catch plate, and a pivoted spring pressed elbow lever normally in contact with the rear edge of the hammer whereby the elbow lever is oscillated as the hammer is tilted.

9. In a device of the kind described, a shaft, and a trigger loosely mounted thereon, comprising a hook, an upper cam surface, in combination with a type carrier provided with a roller adapted to be engaged by the cam surface of the trigger.

10. In a device of the kind described, a shaft, and a trigger loosely mounted thereon, comprising a hook, an upper cam surface, a stop arm and a retracting spring, in combination with a type carrier provided with a roller adapted to be engaged by the cam surface of the trigger.

11. In a device of the kind described, a shaft, a trigger loosely mounted thereon, comprising a forward hook end, and upper cam surface and upwardly projecting stop arm, a rearwardly projecting arm, and a

spring connecting the last named arm with a permanent part of the machine, in combination with a vertically movable type carrier provided with a downwardly projecting arm and a roller carried by said arm and adapted to engage the upper cam surface of the trigger.

12. In a device of the character described, a type hammer loosely mounted on a shaft, in combination with an actuator consisting of an elbow lever and a plurality of rollers adapted to contact with the hammer and arranged between it and the fulcrum of the elbow lever.

13. In a device of the kind described, a type hammer, an actuator therefor provided with a pivot on which the actuator is adapted to be moved as the hammer is moved, and a plurality of rollers intermediate the pivot and the hammer and adapted to contact with the latter.

14. In a device of the kind described, a type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath the hammer and provided with means for moving it in the opposite direction, and a roller on the lever adapted to remain in contact with the rear edge of the hammer in all positions.

15. In a device of the kind described, a type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath the hammer and provided with means for moving it in the opposite direction, and a roller on the uppermost end of the lever adapted to remain in contact with the rear edge of the hammer in all positions.

16. In a device of the kind described, a type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath the hammer and provided with means for moving it in the opposite direction, and a roller on the lever adapted to remain in contact with the rear edge of the hammer in all positions and a second roller intermediate the first roller and the fulcrum of the lever.

17. In a device of the kind described, a type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath the hammer and provided with means for moving it in the opposite direction, and a roller on the uppermost end of the lever adapted to remain in contact with the rear edge of the hammer in all positions, and a second roller intermediate the first roller and the fulcrum of the lever.

18. In a device of the kind described, a type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath the hammer and provided with means for moving it in the opposite direction, and two rollers on the lever which are in contact with the rear of the hammer only when the latter is in a normal position.

19. In a device of the kind described, a

type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath the hammer and provided with means for moving it in the opposite direction, and two
5 rollers on the lever, one of which is always in contact with the rear edge of the hammer.
20. In a device of the kind described, a type hammer, means for moving it in one direction, an elbow lever fulcrumed beneath
10 the hammer and provided with means for moving it in the opposite direction and two

rollers on the lever, one of which is always in contact with the rear edge of the hammer, and the other which is only in contact with the hammer when the latter is in a normal position. 15

Witness my hand this 19th day of March, 1909, at New York, N. Y.

JASON C. LOTTERHAND.

Witnesses:

SARA G. O'ROURKE,
ALAN C. McDONNELL.