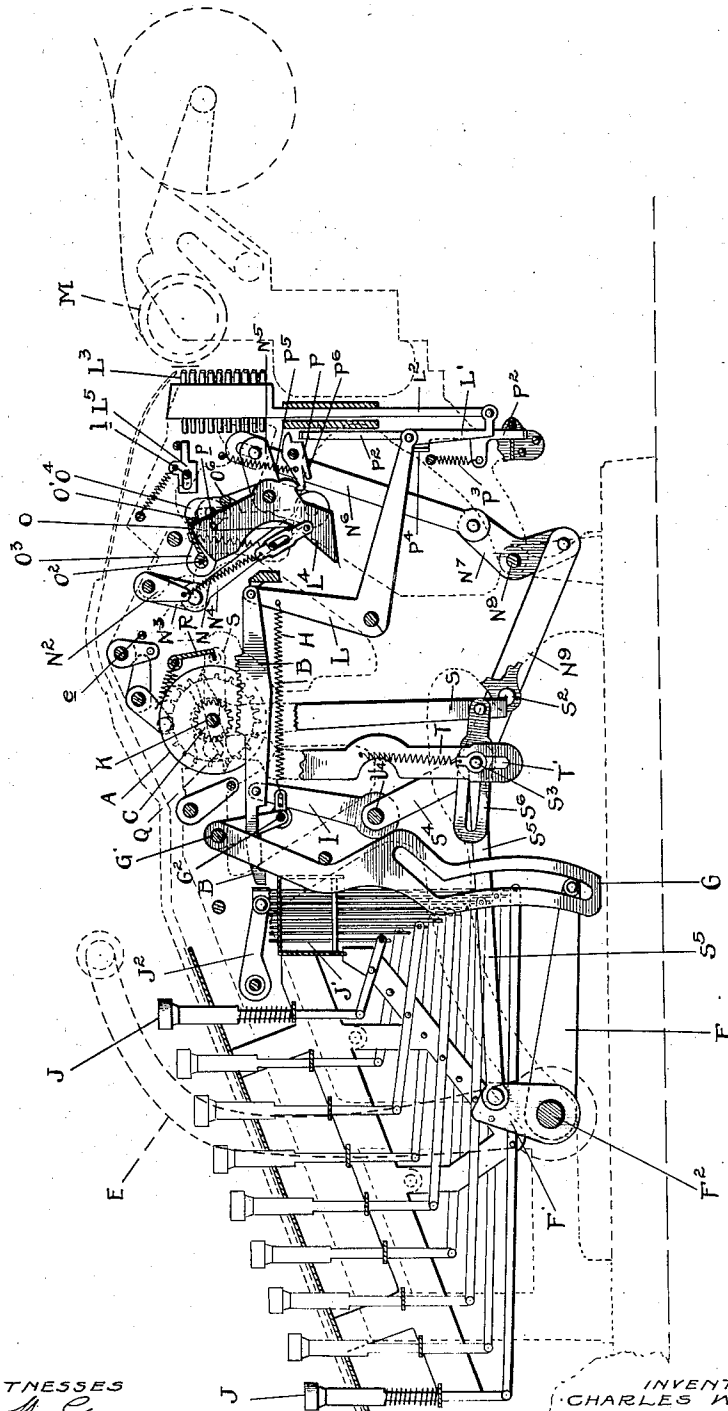


940,758.

C. WALES.
 ADDING MACHINE.
 APPLICATION FILED FEB. 21, 1906.

Patented Nov. 23, 1909.
 4 SHEETS—SHEET 1.

FIG. 1.



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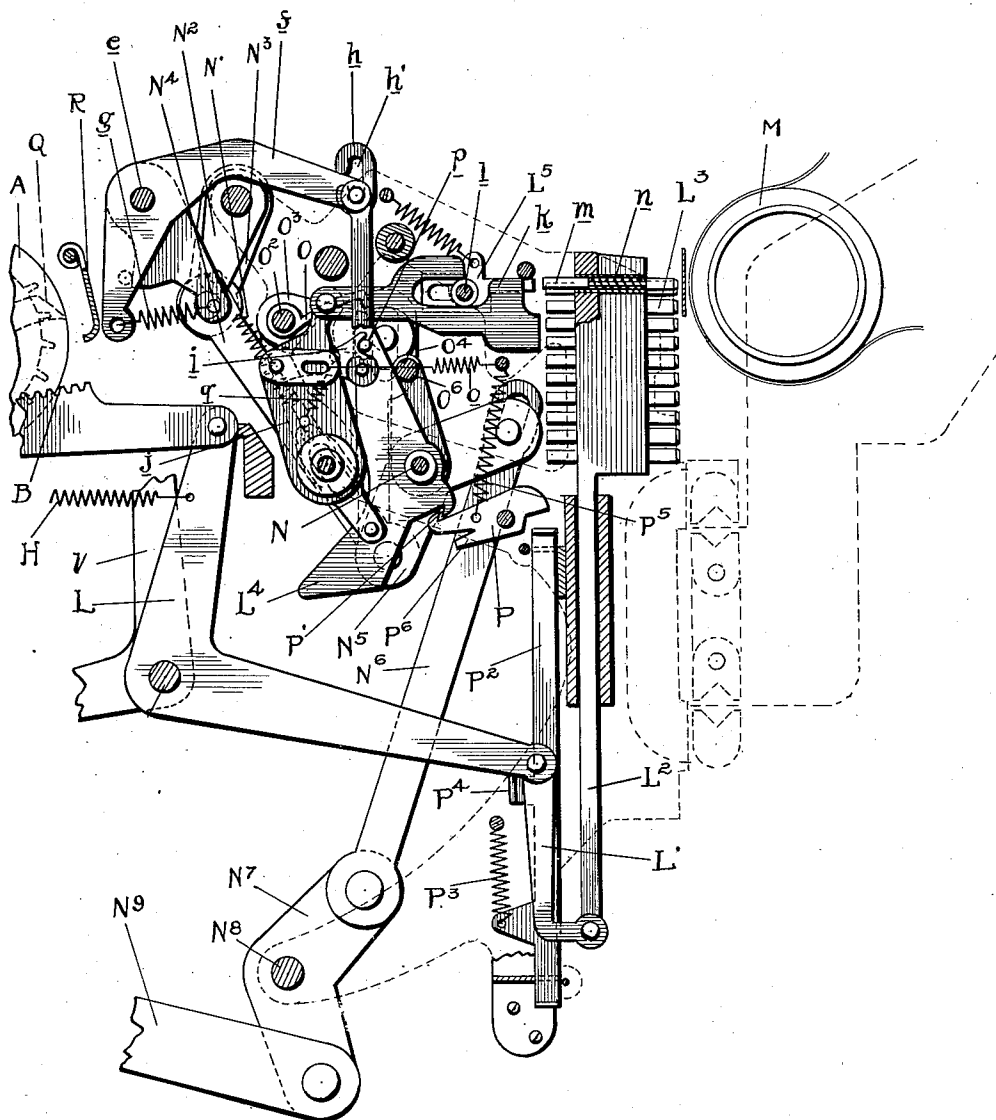
BY Whittmore, Hubert & Whittmore ATT'Y

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 ADDING MACHINE.
 APPLICATION FILED FEB. 21, 1906.

Patented Nov. 23, 1909.
 4 SHEETS—SHEET 2.

FIG. 2.



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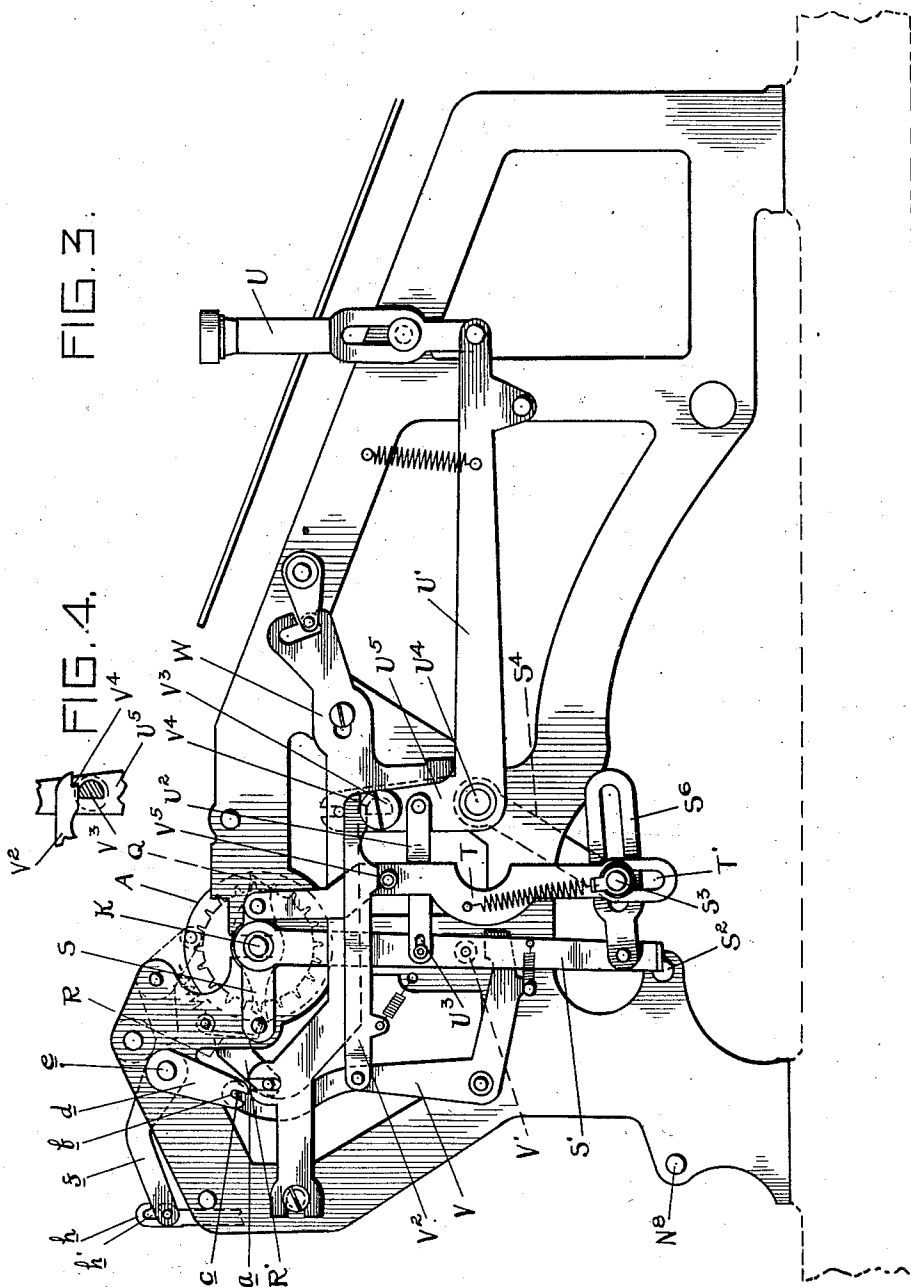
ADDING MACHINE.

APPLICATION FILED FEB. 21, 1906.

Patented Nov. 23, 1909.

4 SHEETS—SHEET 3.

940,758.



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4 SHEETS—SHEET 4.

FIG. 5.

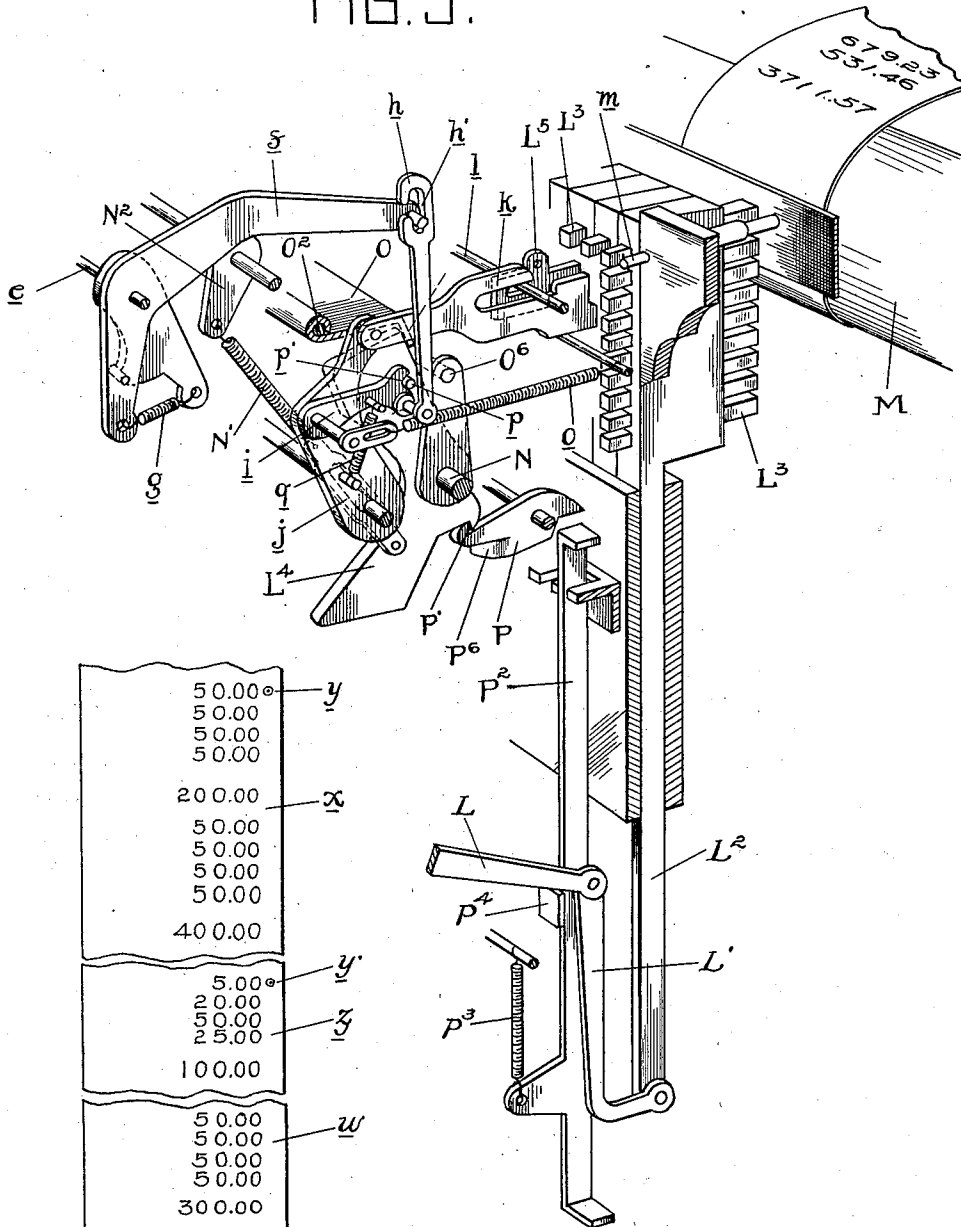


FIG. 6.

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ADDING-MACHINE.

940,758.

Specification of Letters Patent. Patented Nov. 23, 1909.

Application filed February 21, 1906. Serial No. 302,200.

To all whom it may concern:

Be it known that I, CHARLES WALES, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to adding machines and its object is to provide means for automatically printing at the beginning of a list of items and as an incident of the printing of the first item in such list a suitable character which will indicate to the operator that the machine was clear and that no other item is set up on the numeral wheels when the first item of such list is printed.

20 The machine to which the invention specifically relates and with which it is designed to be used is the subject matter of Letters Patent of the United States Nos. 794205, issued July 11, 1905; 979032, issued Aug. 15, 1905; 842232, Jan. 29, 1907, and 880159 issued Feb. 25, 1908, and reference is prayed to the specification of those patents for a particular description of the mechanism not directly relevant to the subject matter of the present application.

30 In using a machine of this character it may sometimes occur through the carelessness of the operator that after a total has been taken he will neglect to clear the machine or restore the parts to their original position and consequently when a new list of items is enumerated and its total is sought to be accumulated and recorded, the total of the preceding list will also be included in the total of the new list, because of the fact that the machine was not previously cleared and an error will result.

40 In the U. S. Letters Patent No. 824510 issued to George E. Schuman, June 26, 1906, there is described a device of this same general character and the subject matter of the invention is a species of the device different in construction and mode of operation from that disclosed in the Schuman patent.

50 In the drawings, Figure 1 is a side elevation and partial central vertical section through an adding machine embodying the invention; Fig. 2 is an enlarged side elevation of the same machine on the other side of the machine; Fig. 3 is a view of a portion of the mechanism shown in Fig. 2 with some additional parts relating to the total

key and its connections; Fig. 4 is a detail of the latch and catch employed with the total key; Fig. 5 is a perspective view of the clear signal hammer and its connections; 60 Fig. 6 is a diagram showing the practical use of the device.

Generally speaking the mechanism comprises registering, accumulating and recording mechanism, and the usual operation is to 65 enumerate the items to be added on the keys and then, by the movement of a handle or the vibration of a shaft, trains of mechanism are set in motion whereby the items so enumerated are set up on numeral wheels and recorded on the strip of paper. Other items 70 subsequently enumerated are accumulated on said wheels and separately recorded, and finally a total is determined and recorded and the machine is cleared, or the parts restored to their initial position, in order that a new adding operation may be commenced.

The registering mechanism consists of a bank of keys arranged in denominational series. Each key J is provided with a stem 80 by the depression of which a stop J' corresponding to the numerical value of the particular key depressed is interposed in the path of rack bars B. These rack bars are each provided with toothed racks on their 85 upper edges and are supported at their front ends upon links I suitably pivoted and at their rear ends upon the extremities of bell crank levers L mounted to oscillate upon a shaft. The other ends of the bell cranks are 90 pivotally connected to the printing mechanism.

The rack bars B are adapted to mesh with pinions C with which the numeral wheels A are provided. These numeral wheels display the digits in proper order on their 95 edges (not shown) and are all mounted on a common shaft K, there being one numeral wheel for each denominational series of keys. It will readily be seen that when the rack 100 bars are moved forward and the racks are in mesh with the pinions the extent of the rotation of the numeral wheels is determined by the extent of the movement of the racks which in turn is governed by the position of 105 the stops above referred to, and which is permanently controlled by a series of other stops provided for that purpose and one of which is seen at J².

The main shaft F² is adapted to be vibrated either by a handle E manually operated, or from a suitable source of power. 110

In its vibration it oscillates an arm F provided with a roller which in turn moves a slotted lever G to rock a shaft G' and which, through an arm G² pulls upon a draft spring H to move the bell crank L and through it to actuate the printing mechanism (as hereafter described) and at the same time to move the racks B to contact with the stops J' which have been set by depression of the keys J and which stops in rising have lifted the permanent stops J² to permit of such movement taking place. During this movement of the handle and rack bars the latter have not been engaged with the pinions of the numeral wheels. At the end of the stroke of the handle, through the slotted link S^c the supports S' upholding the bearings of the numeral wheel shaft K are lowered and the pinions C are consequently lowered and engaged with the teeth upon the rack bars.

The printing mechanism comprises a series of type bars L³ arranged in vertical order within a carrier and so connected to the racks B through intermediate mechanism that, when one of these racks is moved, its corresponding type bar is raised until the type displaying the number corresponding to the extent of the movement of the bar is opposite to the point of print. This point of print is in a fixed horizontal plane and is opposite a shaft of a platen M which in turn is mounted upon a carriage adapted to move laterally in the machine. It will be understood of course that suitable means are provided to move the type ribbon and propel forward the paper and to move the other parts in harmony to perform their several functions as described in the specifications of the patents above referred to. The type bars are propelled forward after being raised to the point of print by means of plungers L⁵ which are struck by hammers pivoted on a rod N common to all of the hammers, and which hammers are propelled by springs N'. The hammers are held normally inactive by means of hammer hooks P mounted on a common rod arranged across the machine. The hammers which have been actuated and uncocked during any operation of the machine are again cocked during the forward stroke of the handle above referred to, the bar O^c connected to this handle by intermediate mechanism and moving against all of the hammers simultaneously, serving to accomplish this function.

The recording of an item set up on the keys is accomplished as follows: As the handle is moved and the bell crank L oscillated, the type bars L³ are moved to the point of print. A releaser bar P² which has been held down by the bell crank L contacting with a wing P⁴ secured to such bar is then free to rise under the tension of a spring P³, and this bar acting against the

hammer hook P, the latter is rotated and releases the hammer L⁴. But all of the hammers are then held by a broad pawl O moved from a cross shaft O² through intermediate mechanism actuated from the handle and when the hammers are thus simultaneously released they strike against their plungers which strike the type bars and the latter impinge against the record strip on the platen and print the item enumerated thereon. On the return stroke of the handle, the numeral wheels are rotated because their pinions are then in engagement with the rack bars and each wheel is turned to an extent corresponding with the key depressed. The racks are also then automatically disengaged from the pinions and the numeral wheel shaft is lifted so that at the end of a full forward and backward stroke of the handle an item set up in the keys has been recorded on the paper strip and registered upon the wheels, while the other parts have been restored to their original positions.

The accumulating mechanism is fully described in the specifications of the patents referred to. It comprises carrying mechanism whereby a number greater than 9 accumulated on one numeral wheel is suitably transferred to the wheel of next higher order.

When it is desired to take a total and "clear" the numeral wheels, or restore them to zero, a total key *u* is depressed before the handle is moved. Such depression oscillates a bell crank lever *u'* which moves a link *u*², displaces the supports S' and thus brings the pinions of the numeral wheels into engagement with the rack bars, so that, when the handle is moved the rack bars actuate the numeral wheels on their forward stroke instead of on their backward stroke as they do when an item is enumerated. Thus each numeral wheel is brought to zero. It will be understood that by appropriate mechanism (not shown) the stops J² have been raised to permit the reverse movement of the rack bars. The motion of the racks in the meantime has been communicated to the printing mechanism, lifted the several type bars to the point of print and recorded the total in the same manner as an item set up on the keys is recorded.

It is obvious that if after the numeral wheels are brought to zero, their pinions could be disengaged from the rack bars and the latter restored to their initial positions, upon the return stroke of the handle, the machine would be clear and ready for another item enumerating operation. This is accomplished by releasing the total key. When this takes place a spring secured to the bell crank *u'* moves it and its upper arm *u*⁵ which is provided with a latch pin V³ which engages a notch V⁴ of a latch lever V² pivoted to a bell crank V pivoted in turn to the frame

of the machine. When the totalizing key was depressed and the arm u^5 was moved to the right, the notch V^4 engaged the latch pin V^3 . Now, as the lever u^7 is moved the latch pin V^3 pushes the latch lever V^2 to the left. This in turn oscillates the bell crank V to the left and lifts the supports S' for the numeral wheel shaft because it engages with a roller V' projecting from each support for that purpose. As the support is raised a spring, provided for that purpose, moves it toward the left and seats it upon a bracket S^2 on the frame of the machine. This disengages the numeral wheel pinion from the rack bars. As the handle is moved back to its original position a swinging rod S^3 through appropriate mechanism is caused to engage a supplementary support T , which being slightly elevated and connected to the bearings S of the numeral shaft, tends to keep the latter in place. When this supplementary support is raised a pin V^6 , with which it is provided, lifts the latch lever V^2 and restores it to its original position. The total registered on the wheels has thus been recorded on the record strip and the machine has been "cleared."

The device employed to indicate that the mechanism has been cleared and which is therefore called a "clear signal" will now be described. Mounted on a rod secured to the frame of the machine at its printing section is a hammer having a body j to which is hinged a striker h , the latter being forked to engage with a guide rod l . A bracket secured to the frame of the machine is provided with a sleeve incasing a signal rod m which rod is provided with a retracting spring n and on its outer extremity has a special type symbol so that when the signal rod is projected against the inking ribbon and the record strip such symbol or signal is printed thereon.

The special signal hammer j is actuated by a spring o secured to a fixed part of the machine and to a pin on the hammer. The hammer is also provided with a pawl i mounted to swing on a pin and normally under tension of a spring and adapted to be moved against such tension by a connecting rod h pivoted to it.

The units hammer L^4 is provided with a projecting pin p with which the pawl i is intended to engage when desired. Normally the units hammer and its pin p oscillate without contacting with the pawl i . The pin p and pawl i constitute in effect a temporary coupling between the units hammer and the special signal hammer. If, however, the pawl i is raised so that it is moved into the cocking path of the pin p , the latter, pressing against the pawl, moves it and the signal hammer j , stretches the spring o and holds the pawl i and hammer j in that position, so long as the units ham-

mer is held in position. In other words, if the pawl i is raised and the units hammer is cocked, the signal hammer j is cocked also and when the units hammer is discharged the signal hammer is also discharged, strikes the signal rod m and prints the appropriate symbol on the record strip. But the pawl i can only be raised when the numeral wheels have been cleared by the release of the total key after it has been depressed in the operation of taking and recording a total; because the lever p can only be raised by the upward movement of a bell crank lever f which is mounted to a rock shaft e secured in the frame of the machine and is only moved when the bell crank V is moved in the operation of clearing the machine. As this bell crank V is only moved when the machine is cleared it is evident that the pawl i is only raised at such times, consequently the clear signal or special type character can only be recorded on the record strip when the unit of the first item is recorded after a total has been taken. The reason for coupling this clear signal to the units hammer is because in recording any item whatever the units hammer is always used. As soon as the units hammer has been actuated, the pawl i will drop and its hammer will remain inoperative until again set. A little spring assists this disengagement. The lever h has a lost motion slot at its upper end to permit the bell crank f to return to its original position.

What I claim as new is:—

1. In a machine of the character described, comprising accumulating, totalizing, clearing and printing mechanisms, means for automatically printing a special character with the printing of the first item after the machine has been cleared, comprising a type bar carrying such special character adapted to be reciprocated at the point of print, a special hammer adapted to actuate the same, means for charging the hammer with energy, a units hammer, a temporary coupling between it and the special hammer and means actuated from the clearing mechanism of the machine to move such temporary coupling into an operative position.

2. In a machine of the character described, comprising accumulating, totalizing, clearing and printing mechanisms, means for automatically printing a special character with the printing of the first item after the machine has been cleared, comprising a type bar carrying such special character adapted to be reciprocated at the point of print, a special hammer adapted to actuate the same, means for charging the hammer with energy, a units hammer, a temporary coupling between it and the special hammer and means actuated from the clearing mechanism of the machine to move such temporary coupling into an operative position and means for

automatically retracting the special type bar away from the printing plane.

3. In a machine of the character described, comprising accumulating, totalizing, clearing and printing mechanism, means for automatically printing a special character with the printing of the first item after the machine has been cleared, comprising a type bar carrying such special character adapted to be reciprocated at the point of print, a special hammer adapted to actuate the same means for charging the hammer with energy, a units hammer, a temporary coupling between it and the special hammer and means actuated from the clearing mechanism of the machine to move such temporary coupling into an operative position and means for automatically retracting the special type bar away from the printing plane, including a sleeve in which it is adapted to move and a spring placed under tension when it is moved.

4. In a machine of the character described, comprising accumulating, totalizing, clearing and printing mechanisms, means for automatically printing a special character with the printing of the first item after the machine has been cleared, comprising a type bar, carrying such special character adapted to be reciprocated at the point of print, a units hammer and means for cocking it, a special hammer adapted to strike the special type bar, a coupling between the two hammers consisting of a fixed member on the units hammer and a movable member on the special hammer and means for bringing the movable member into position to cooperate with the fixed member actuated from the clearing mechanism of the machine.

5. In a machine of the character described, comprising accumulating, totalizing, clearing and printing mechanisms, means for automatically printing a special character with the printing of the first item after the machine has been cleared, comprising a type bar, carrying such special character adapted to be reciprocated at the point of print, a units hammer and means for cocking it, a special hammer adapted to strike the special type bar, a coupling between the two hammers consisting of a fixed member on the units hammer and a movable member on the special hammer and means for bringing the movable member into position to cooperate with the fixed member actuated from the clearing mechanism of the machine, and including a total key, a link adapted to move the movable member and intermediate mechanism between it and the total key.

6. In a machine of the character described, comprising accumulating, totalizing, clearing and printing mechanisms, means for automatically printing a special character with the printing of the first item after the ma-

chine has been cleared, comprising a type bar carrying such special character adapted to be reciprocated at the point of print, a units hammer and means for cocking it, a special hammer adapted to strike the special type bar, a coupling between the two hammers consisting of a fixed member on the units hammer and a movable member on the special hammer and means for bringing the movable member into position to cooperate with the fixed member actuated from the clearing mechanism of the machine, and including a total key, a link adapted to move the movable member and intermediate mechanism between it and the total key, whereby when the latter is elevated the link is also elevated.

7. In a machine of the character described, a special type bar, a special hammer therefor comprising an oscillating body, a striker hinged thereto, an actuating spring adapted to move the body, a units hammer and means for moving the special hammer body against the tension of its actuating spring moved from the units hammer.

8. In a machine of the character described, a special type bar, a special hammer therefor comprising an oscillating body, a striker hinged thereto, an actuating spring adapted to move the body, a units hammer and means for moving the special hammer body against the tension of its actuating spring moved from the units hammer and consisting of a swinging member secured to the special hammer body and a cooperating member secured to or made integral with the units hammer.

9. In a machine of the character described, a special type bar, a special hammer therefor comprising an oscillating body, a striker hinged thereto, an actuating spring adapted to move the body, a units hammer and means for moving the special hammer body against the tension of its actuating spring moved from the units hammer, in combination with means for normally preventing such movement.

10. In a machine of the character described comprising clearing mechanism, a special type bar, a special hammer therefor comprising an oscillating body, a striker hinged thereto, an actuating spring adapted to move the body, a units hammer and means for moving the special hammer body against the tension of its actuating spring moved from the units hammer and consisting of a swinging member secured to the special hammer body and a cooperating member secured to or made integral with the units hammer, in combination with means for bringing the swinging member on the special hammer into the path of the cooperating member on the units hammer only when the clearing mechanism has been operated.

11. In a machine of the character de-

scribed, a special type bar, a special hammer therefor, comprising an oscillating body, a striker hinged thereto, an actuating spring adapted to move the body, a units hammer and means for moving the special hammer body against the tension of its actuating spring, consisting of a pin on the units hammer and a cooperating pawl on the special hammer.

12. In a machine of the character described, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a device on the units hammer normally out of contact with the special hammer, a cooperating movable device on the special hammer and means for moving it into the path of the device on the units hammer.

13. In a machine of the character described comprising clearing mechanism, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a device on the units hammer normally out of contact with the special hammer, a cooperating movable device on the special hammer and means for moving it into the path of the device on the units hammer automatically operated from the clearing mechanism of the machine.

14. In a machine of the character described, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a device on the units hammer normally out of contact with the special hammer, a cooperating movable device on the special hammer and means for moving it into the path of the device on the units hammer, whereby when contact occurs between the two devices the units hammer moves the special hammer against the tension of the actuating spring of the latter.

15. In a machine of the character described, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a pin on the units hammer, a pawl on the special hammer normally out of the path of movement of the pin and means for temporarily moving it into said path.

16. In a machine of the character described comprising clearing mechanism, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a pin on the units hammer, a pawl on the special hammer normally out of the path of movement of the pin and means for temporarily moving it into said path automatically operated from the clearing mechanism of the machine.

17. In a machine of the character described, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a pin on the units hammer, a pawl on the special

hammer normally out of the path of movement of the pin and means for temporarily moving it into said path, whereby when the pin contacts with the pawl the special hammer is moved against the tension of its actuating spring.

18. In a machine of the character described comprising clearing mechanism, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a pin on the units hammer, a pawl on the special hammer normally out of the path of movement of the pin and means for temporarily moving it into said path, consisting of a link secured to the pawl and operated from the clearing mechanism of the machine.

19. In a machine of the character described comprising clearing mechanism, type arranged in denominational series, means for moving the type in the series to a printing plane at the will of the operator, hammers arranged in identical series, a special type permanently located at the printing plane to which the series type are adapted to be moved and means operated from the clearing mechanism of the machine to print from the special type as soon as any other type in the series is actuated.

20. In a machine of the character described, type arranged in denominational series, hammers adapted to actuate the same, one for each type series and all loosely mounted on the same shaft, a special type, a special hammer therefor, springs for putting each hammer in the series under tension, means for releasing the entire series of hammers simultaneously from such tension, an independent spring for putting the special hammer under tension and means for normally keeping such spring relaxed.

21. In a machine of the character described, type arranged in denominational series, hammers adapted to actuate the same, one for each type series and all loosely mounted on the same shaft, a special type, a special hammer therefor, springs for putting each hammer in the series under tension, means for releasing the entire series of hammers simultaneously from such tension, an independent spring for putting the special hammer under tension and means for normally keeping such spring relaxed, comprising an oscillating body adapted to swing toward the spring.

22. In a machine of the character described, type arranged in denominational series, hammers adapted to actuate the same, one for each type series and all loosely mounted on the same shaft, a special type, a special hammer therefor, springs for putting each hammer in the series under tension, means for releasing the entire series of hammers simultaneously from such tension, an independent spring for putting the special ham-

mer under tension and means for stretching it, comprising a pin on the units series hammer and a pawl on the special hammer brought into the path of the pin when the units hammer is oscillated.

23. A special hammer, comprising a body, a shaft on which it is adapted loosely to oscillate, a striker hinged to the body and means for guiding it in its movement, a pawl hinged to the hammer body, and means normally tending to keep the pawl in one position.

24. A special hammer comprising a body, a shaft on which it is adapted loosely to oscillate, a striker hinged to the body and means for guiding it in its movement, a pawl hinged to the hammer body and means normally tending to keep the pawl in one position, consisting of a pivot on which the pawl is adapted to swing and a spring attached to the free end of the pawl and the special hammer body.

25. In a machine of the character described comprising accumulating and clearing mechanism, a special hammer, comprising a body, a shaft on which it is adapted loosely to oscillate, a striker hinged to the body and means for guiding it in its movement, a pawl hinged to the hammer body and means normally tending to keep the pawl in one position, and means brought into operation through the clearing mechanism of the machine adapted to move the pawl to another position.

26. A special hammer, comprising a body, a shaft on which it is adapted loosely to oscillate, a striker hinged to the body and means for guiding it in its movement, a pawl hinged to the hammer body and means normally tending to keep the pawl in one position, in combination with a second hammer provided with means for engaging the pawl when the latter is moved out of its normal position.

27. A special hammer comprising a body, a shaft in which it is adapted loosely to oscillate, a striker hinged to the body and means for guiding it in its movement, a pawl hinged to the hammer body and means normally tending to keep the pawl in one position, consisting of a pivot on which the pawl is adapted to swing and a spring attached to the free end of the pawl and the special hammer body, in combination with a second hammer provided with means for engaging the pawl when the latter is moved out of its normal position.

28. A special hammer, comprising a body, a shaft on which it is adapted loosely to oscillate, a striker hinged to the body and means for guiding it in its movement, a pawl hinged to the hammer body and means normally tending to keep the pawl in one position, and means brought into operation through the clearing mechanism of the ma-

chine adapted to move the pawl to another position, in combination with a second hammer provided with means for engaging the pawl when the latter is moved into such other position.

29. In a machine of the character described, a total key, a lever moved therefrom, numeral wheels in series mounted on a common shaft, means for moving the latter, intermediate mechanism between such means and the total key, whereby when the total key is depressed the numeral wheel shaft is lowered, and when it is elevated the numeral wheel shaft is raised, a units hammer, a special hammer, a temporary coupling between them and means for moving such coupling into operative position, comprising a link, and intermediate mechanism between it and the total key whereby when the key is elevated the coupling is moved.

30. In a machine of the character described, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a device on the units hammer normally out of contact with the special hammer, a cooperating movable device on the special hammer and means for moving it into the path of the device on the units hammer, comprising a link, an elbow lever by which it is moved, a rock shaft to which the lever is secured, a crank for rocking said shaft, a lever cooperating with the crank to move it, a latch bar for moving the lever, a total key lever, an actuating spring therefor, and a catch thereon adapted to engage the latch bar.

31. In a machine of the character described, a special type hammer, an actuating spring therefor, a units hammer, means adapted to cock and release the latter, a device on the units hammer normally out of contact with the special hammer, a cooperating movable device on the special hammer and means for moving it into the path of the device on the units hammer, comprising a link, an elbow lever by which it is moved, a loose connection between the link and the lever, a rock shaft to which the lever is secured, a crank for rocking said shaft, a lever cooperating with the crank to move it, a latch bar for moving the lever, a total key lever, an actuating spring therefor, and a catch thereon adapted to engage the latch bar.

32. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever and means for moving the lever comprising a total key whereby when the key is moved in one direction the link is not moved owing to the lost motion but when the key is moved in the opposite direction the link is moved.

33. In a machine of the character de-

scribed, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key whereby when the key is depressed the link is not moved owing to the lost motion but when it is elevated automatically the link is moved to move the special hammer pawl.

34. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key, comprising a crank whereby the lever is moved, and a slidable latch rod moved from the total key to move the crank.

35. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key, comprising a crank whereby the lever is moved, and a suitable latch rod moved from the total key to move the crank and a swinging lever intermediate the crank and the latch rod.

36. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key, comprising a crank whereby the lever is moved, and a suitable latch rod moved from the total key to move the crank and a swinging lever intermediate the crank and the latch rod and a loose connection between the crank and the swinging lever.

37. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by

which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key, comprising a crank whereby the lever is moved, and a slidable latch rod moved from the total key to move the crank, a lever moved directly from the total key and a catch thereon adapted to cooperate with the latch rod.

38. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key, comprising a crank whereby the lever is moved, and a slidable latch rod moved from the total key to move the crank, a lever moved directly from the total key and a catch thereon adapted to cooperate with the latch rod and a spring secured to the lever last mentioned and adapted automatically to retract such lever to position when the total key is released.

39. In a machine of the character described, a special hammer, a pawl hinged thereon, a link secured thereto, a lever by which the link is moved, a lost motion device between the link and the lever, a total key adapted to be depressed by hand and retracted to position automatically by a spring and intermediate mechanism between the lever and the total key, comprising a crank whereby the lever is moved, and a slidable latch rod moved from the total key to move the crank, a lever moved directly from the total key and a catch thereon adapted to cooperate with the latch rod and a spring secured to the lever last mentioned and adapted automatically to retract such lever to position when the total key is released and means for limiting the movement of the lever when retracted.

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

CHARLES WALES.

Witnesses:

E. I. SCHNELL,
F. S. WHEELER.