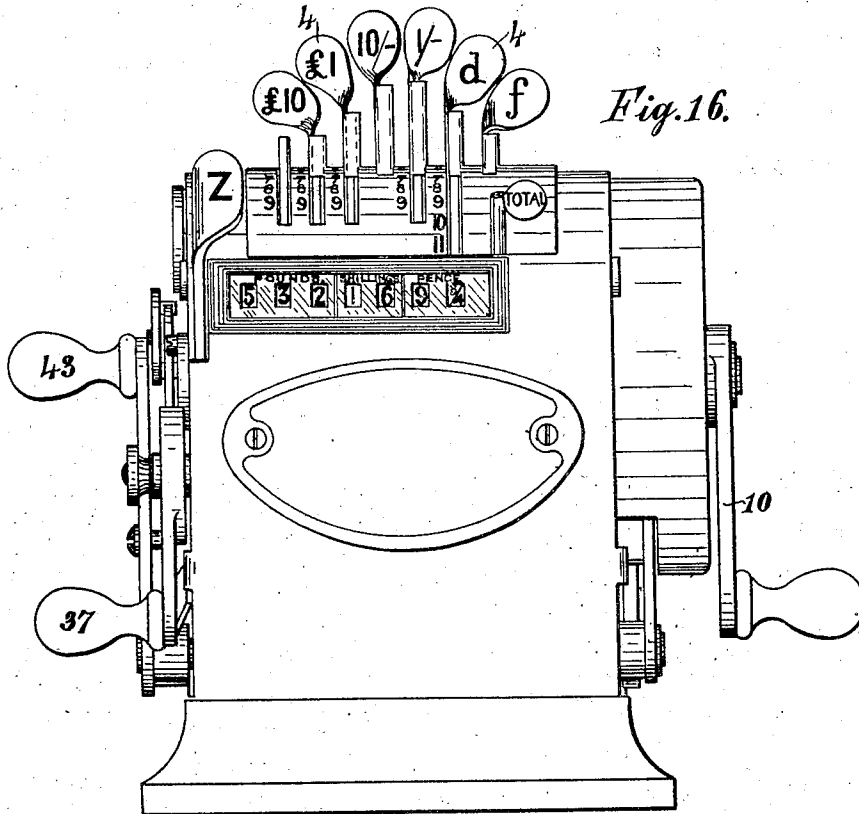
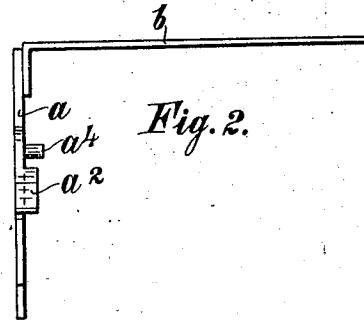
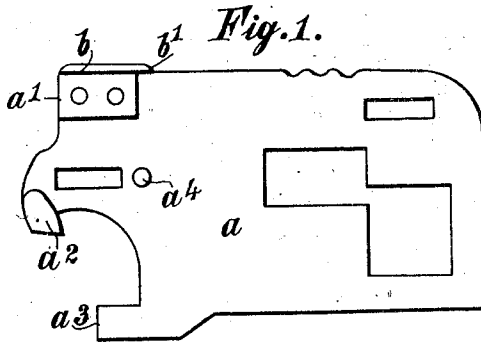


J. M. TOURTEL.
 ADDING AND PRINTING MACHINE.
 APPLICATION FILED MAR. 21, 1910.

Patented Mar. 26, 1912.
 8 SHEETS—SHEET 1.

1,021,588.



WITNESSES:
H. A. Berrigan
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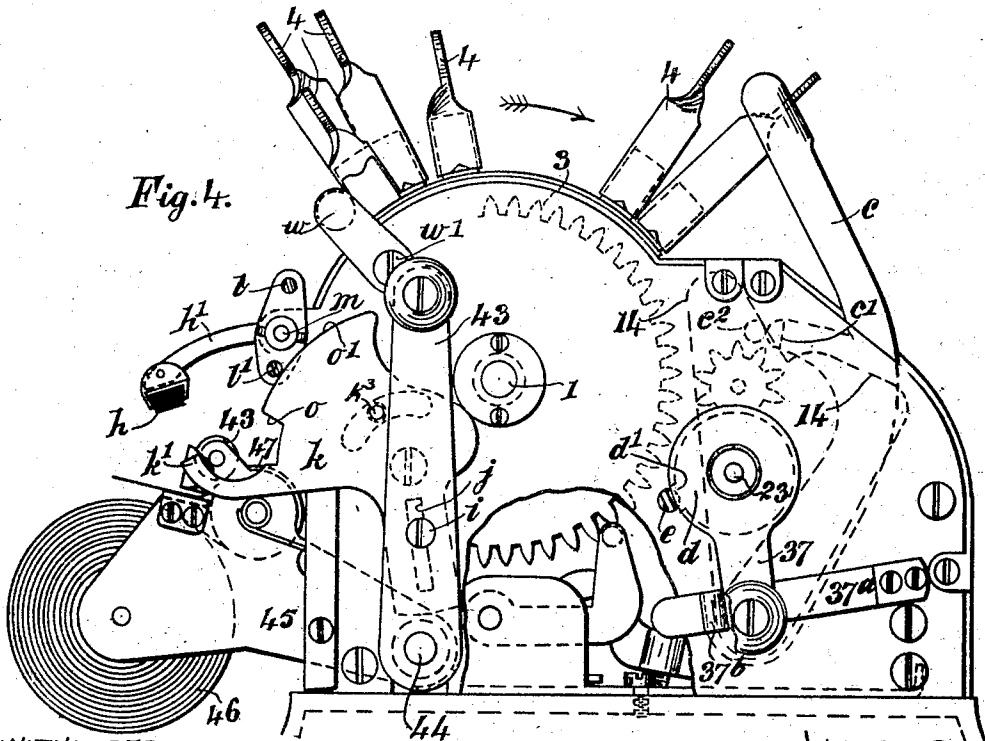
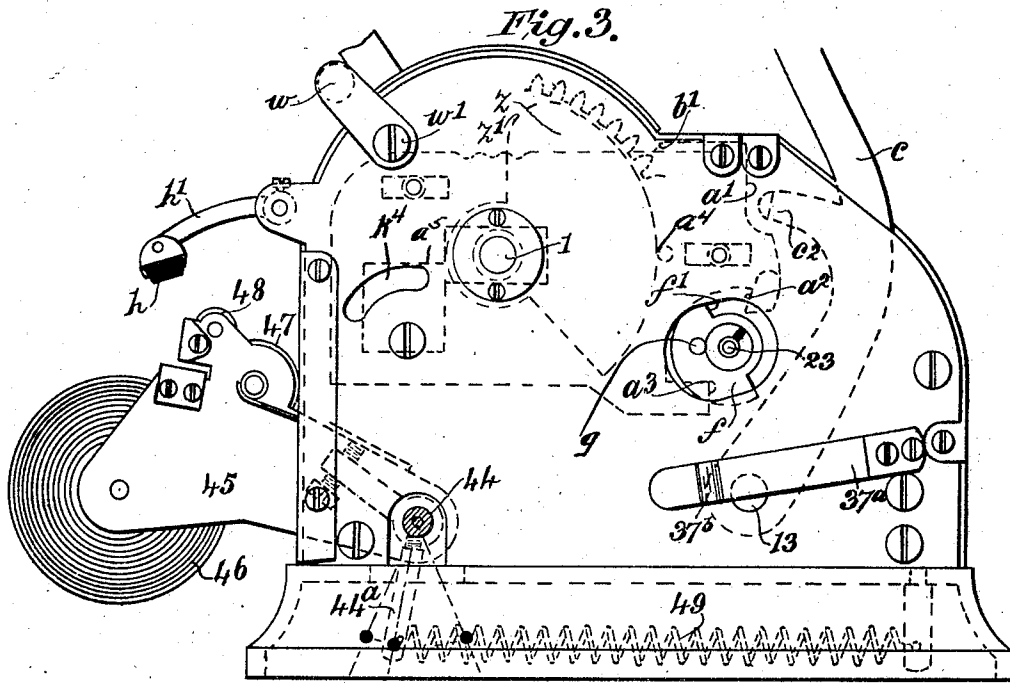
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1,021,588.

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8 SHEETS—SHEET 2.



WITNESSES:

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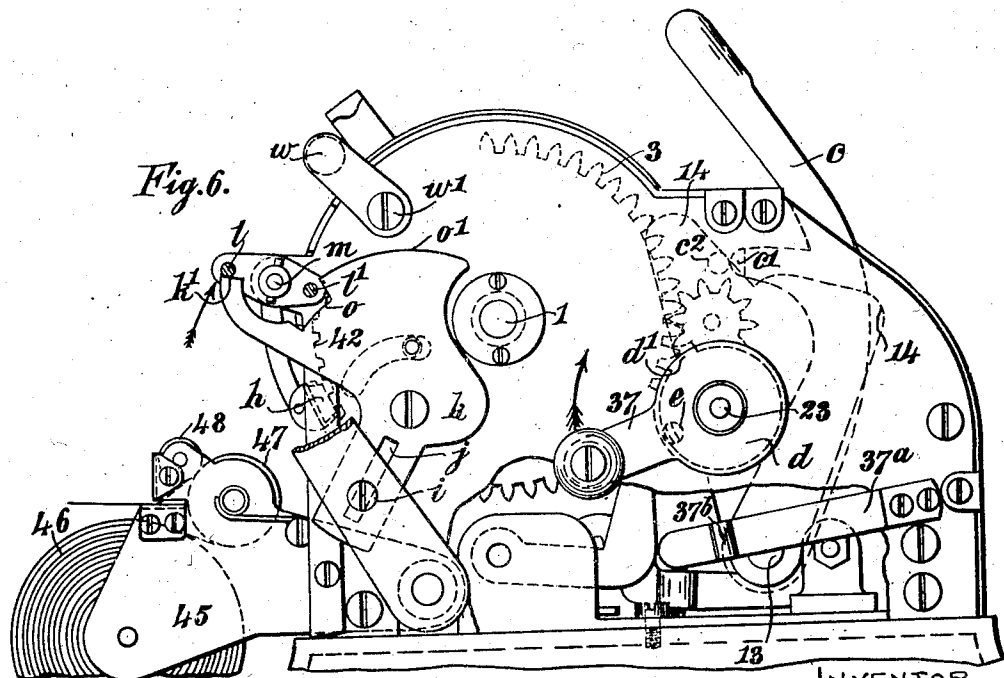
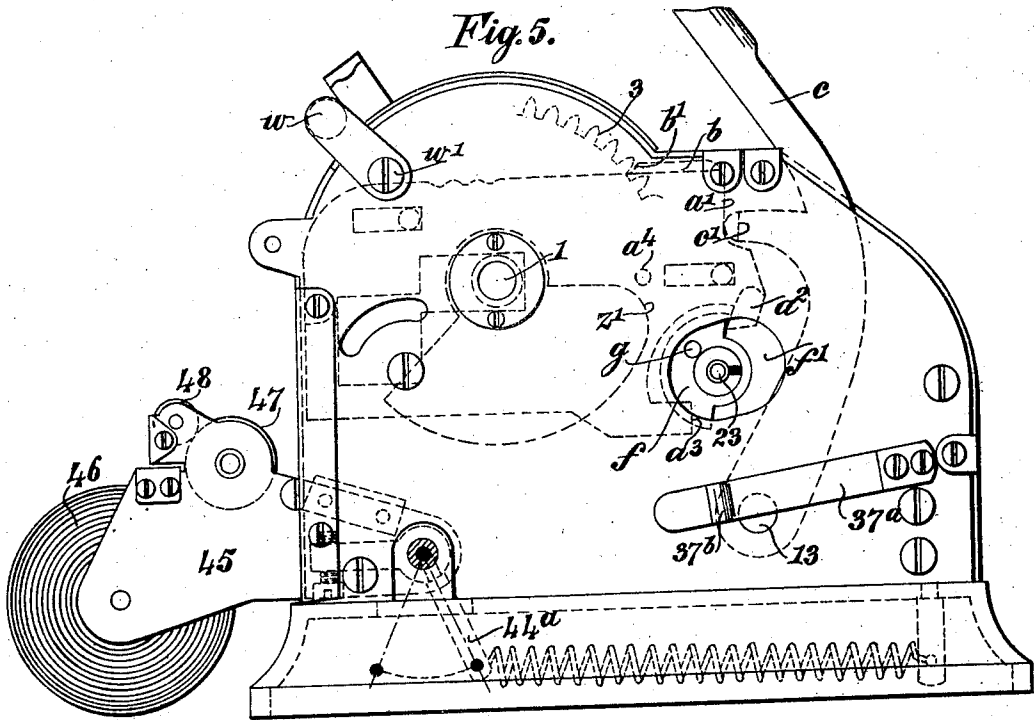
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1,021,588.

Patented Mar. 26, 1912.

8 SHEETS—SHEET 3.



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 ADDING AND PRINTING MACHINE.
 APPLICATION FILED MAR. 21, 1910.

1,021,588.

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8 SHEETS—SHEET 4.

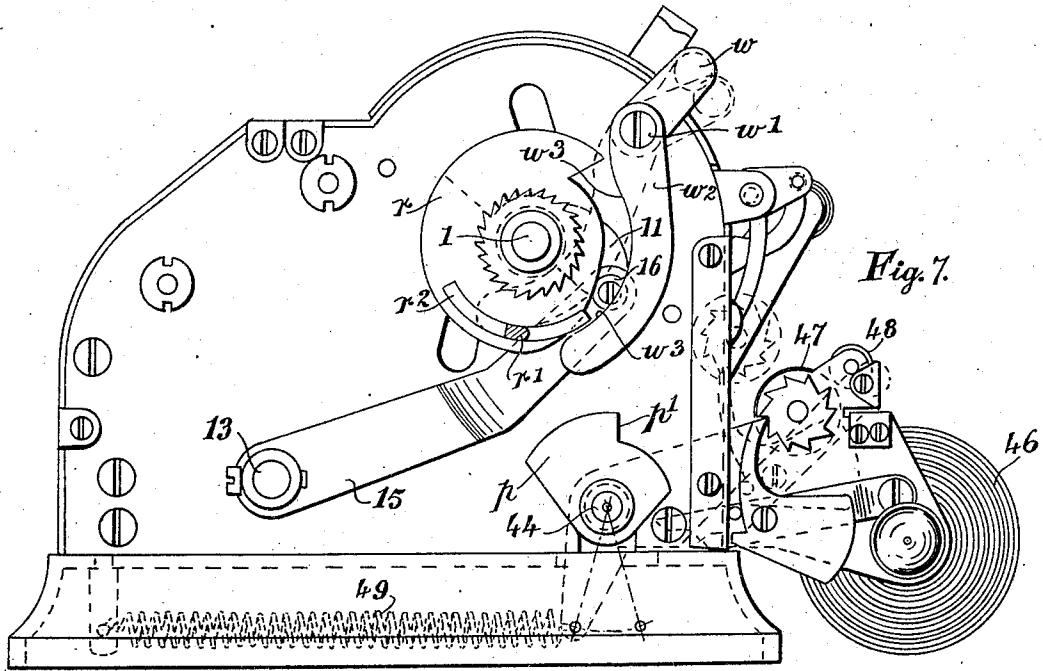


Fig. 7.

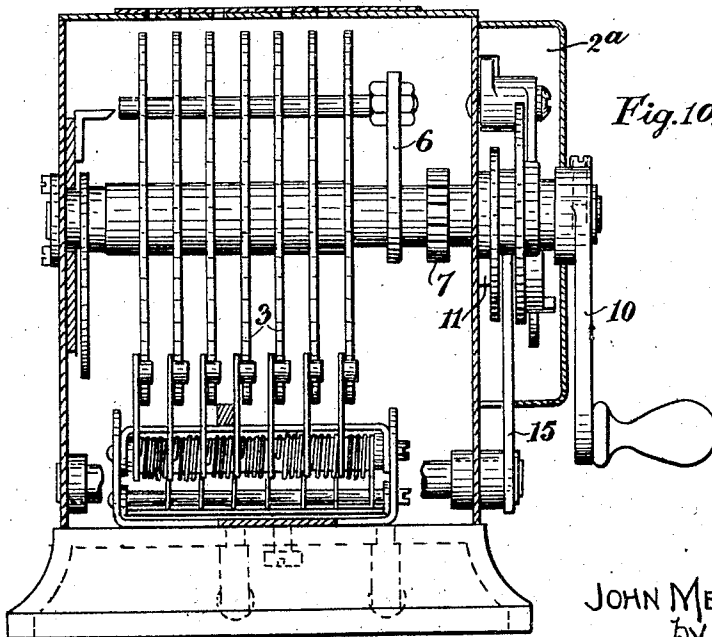


Fig. 10.

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 ADDING AND PRINTING MACHINE.
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Patented Mar. 26, 1912.

8 SHEETS—SHEET 5.

1,021,588.

Fig. 8.

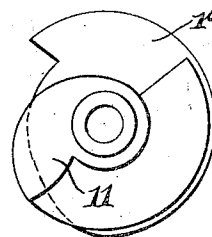
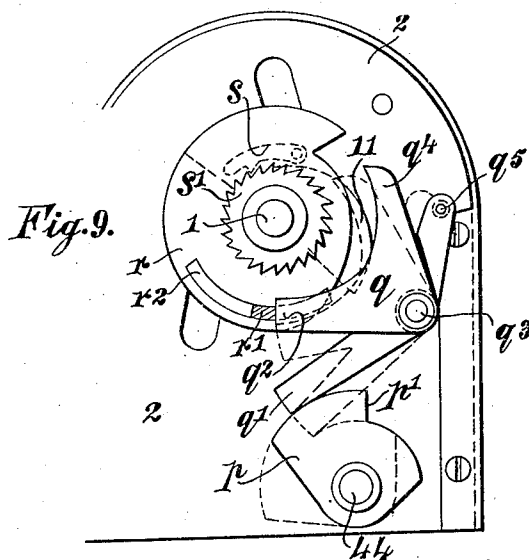
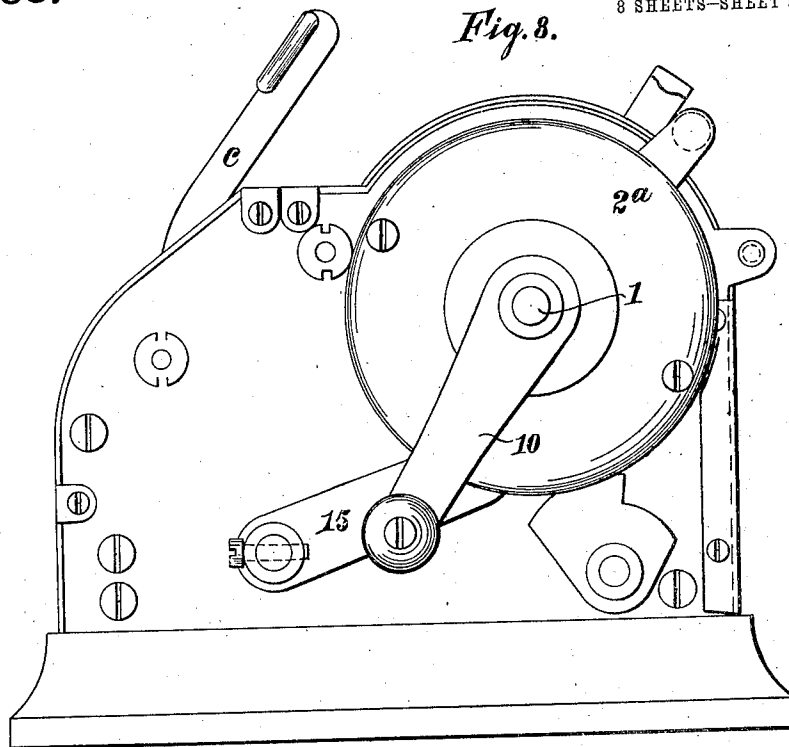


Fig. 12.

WITNESSES:

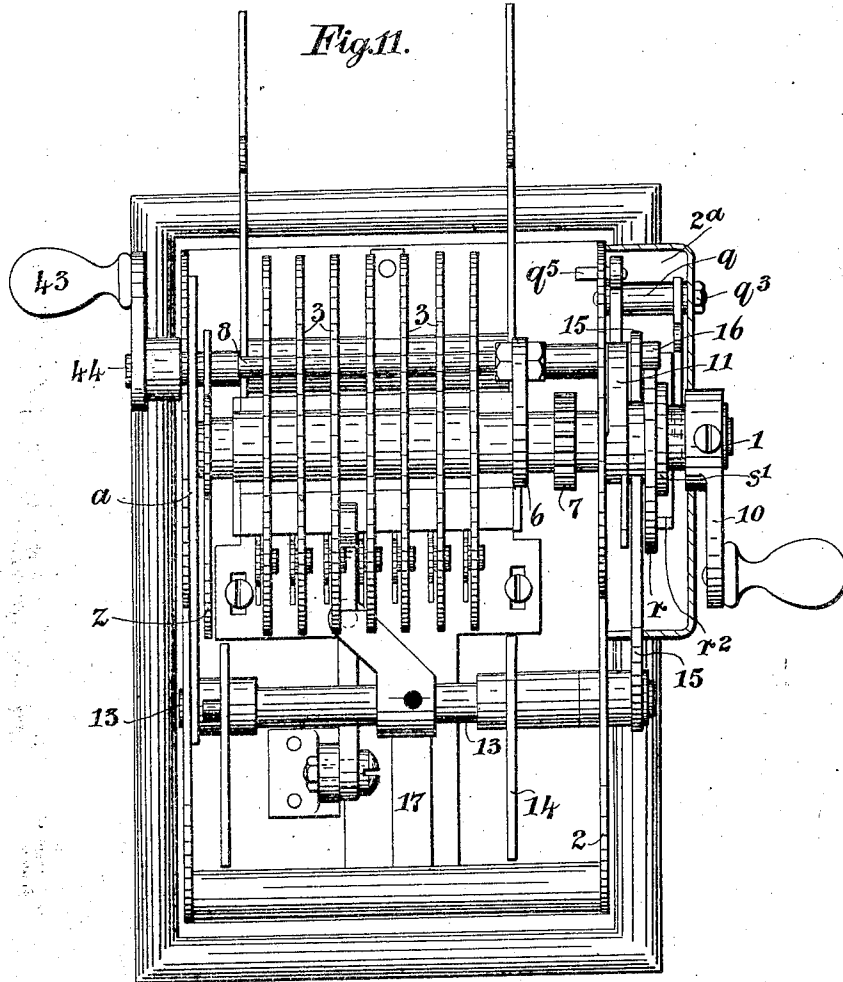
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 APPLICATION FILED MAR. 21, 1910.

Patented Mar. 26, 1912.
 8 SHEETS—SHEET 6.

1,021,588.



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 APPLICATION FILED MAR. 21, 1910.

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Patented Mar. 26, 1912.

8 SHEETS—SHEET 7.

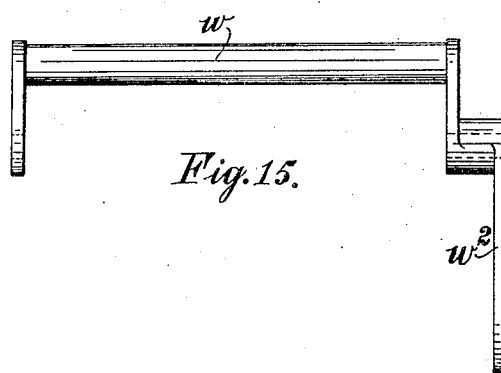


Fig. 15.

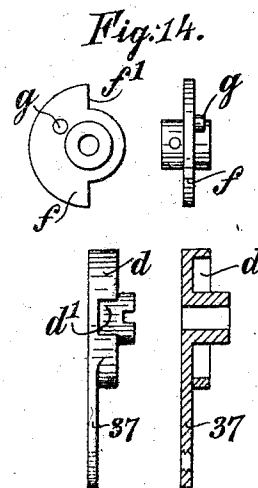


Fig. 13.

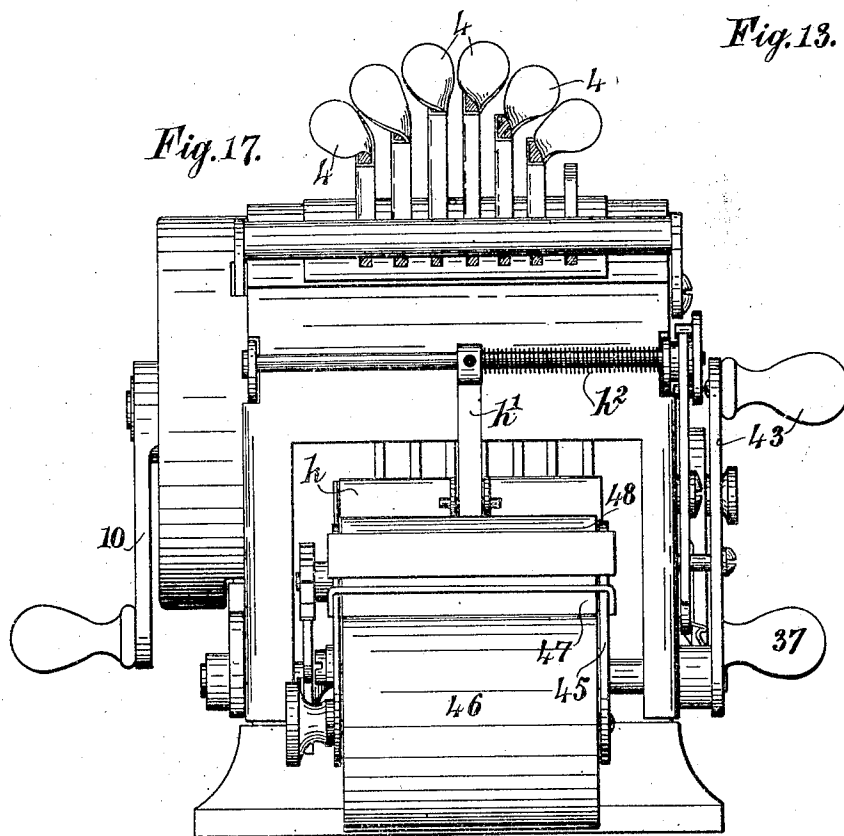


Fig. 17.

WITNESSES.

W. H. Berrigan
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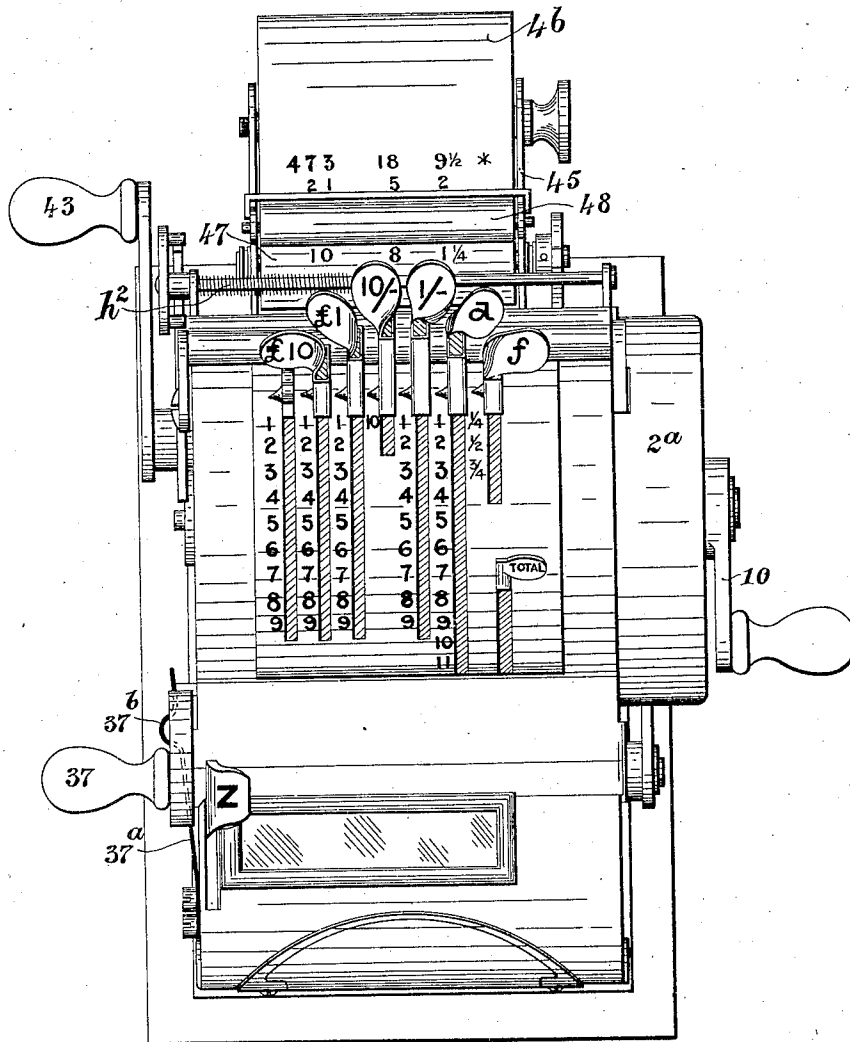
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 ADDING AND PRINTING MACHINE.
 APPLICATION FILED MAR. 21, 1910.

1,021,588.

Patented Mar. 26, 1912.
 8 SHEETS-SHEET 8.

Fig. 18.



WITNESSES;

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UNITED STATES PATENT OFFICE.

JOHN MESNY TOURTEL, OF LONDON, ENGLAND.

ADDING AND PRINTING MACHINE.

1,021,588.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed March 21, 1910. Serial No. 550,730.

To all whom it may concern:

Be it known that I, JOHN MESNY TOURTEL, a citizen of the United Kingdom of Great Britain and Ireland, and resident of 57 Chiswell street, London, England, have invented certain new and useful Improvements in Adding and Printing Machines, of which the following is a specification, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in adding machines of the kind in which the amounts are set by rotating toothed sectors through the necessary angle whereon the printing of the amount and the operation of adding are effected by means of separate handles or levers.

The main object of the present invention, is to insure the correct operation of the machine in a definite sequence, so that the amount set will be properly printed and added with as great accuracy and surety as this is done in the more expensive and elaborate machines employing key levers and a single handle.

The invention further relates to novel constructional features which will be more readily understood from the following description, while the novel features are pointed out in the appended claims.

In the drawings which illustrate one form of the invention by way of example, Figure 1 is a separate detached side elevation of the locking slide which performs an important function in this invention. Fig. 2 is an end view of the slide shown in Fig. 1. Fig. 3 is a side view of the machine looking on the opposite side to that on which the operating handle is arranged; the printing lever and the pivoted plate coöperating therewith are omitted. Fig. 4 is a view similar to Fig. 3, with the printing lever and its coöperating pivoted plate shown in position during operation. Fig. 5 is a view similar to Fig. 3, showing the parts which coöperate with the printing lever, in their idle position. Fig. 6 is a partial sectional side elevation similar to Fig. 4, with the parts in the idle position represented in Fig. 5. Fig. 7 is a side elevation with certain parts removed, looking on the opposite side to Figs. 3—6, the parts being in the idle position represented in Figs. 5 and 6. Fig. 8 is an outside view similar to Fig. 7, but with the parts all in place. Fig.

9 is a detail of the locking means for the operating shaft. Fig. 10 is a cross section of the machine. Fig. 11 is a plan with the casing removed. Fig. 12 is a detail view of the composite cam on the operating shaft. Fig. 13 shows details of the zeroizing lever. Fig. 14 shows details of the lock operating cam on the zeroizing shaft. Fig. 15 is a detail view of the restoring lever which returns those sectors to their initial positions which have over-run during the process of "tens" carrying. Figs. 16 and 17 are front and rear views respectively of the entire machine, while Fig. 18 is a plan view.

The sectors 3, are separately mounted on a sleeve which surrounds the operating shaft 1. Each sector is provided with teeth 3, over one part of its circumference and type 42 (Fig. 6) over another part. The sectors together with the shaft are supported in a housing formed of two side cheeks 2, and a curved sheet metal casing 2^a, these parts being conveniently fixed on a hollow cast metal base. The sectors are set by means of finger pieces 4, (Fig. 16) which project through slots in the case.

Printing.—Having set the sectors 3, the next operation is to print the amount registered. A roll of paper 46, is carried by two side cheeks 45, fixed to oscillate with a shaft 44, operable by the printing lever 43. The shaft 44, is also controlled by a coiled spring 49, attached to an arm 44^a, both the arm and the coil spring being located within the hollow cast base. The paper passes from the roll 46, around the pressure roll 47, and then off by the take off or tautening roll 48. Mounted above the roll 46, there is the inking pad *h*, carried by the arm *h'* mounted on a spindle *m*, supported in lugs on the side cheeks 2, of the machine. Around the spindle *m*, there is a spring *h*² (see Fig. 17) which always tends to press the inking pad toward the type on the sectors 3. This pressure is however normally prevented by an arm *h'*, on a plate *k*, pivoted at *k*². This arm engages the pin *l*, on a double armed lever mounted on the spindle *m*. The other arm of this lever is in the path of a cam edge *o*, on the plate *k*. The plate *k* has a downwardly projecting leg (see Figs. 4 and 6) which is provided with a slot *j*, in which a pin *i*, carried by the printing lever 43, projects. When therefore, the printing lever

43, moves from the position shown in Fig. 6, to that shown in Fig. 4, the arm or nose piece h' , moves away from the pin l , and allows the inking pad h , to ink the type while immediately thereafter the nose o , engages the pin l' , and removes the inking pad h , from the type. As soon as the nose o , engages the pin l' , the arm 44^b , on the shaft 44, engages a plate 44^c which bridges the two side cheeks 45 , and thereby the paper and the roll 47, are brought against the type on the sectors to receive the impression of the amount set. It will be understood that the operation just described has oscillated the plate h , from the position shown in Fig. 6, to that shown in Fig. 4. To the plate h , there is fixed a pin h^3 , which projects through and moves in a curved slot h^4 , in one side cheek 2 of the machine, that is to say the left hand cheek in Figs. 10, 16 and 18. On the inside face of this cheek the slide a , shown in detail in Fig. 1, is mounted. The slide a is mounted close up to the internal surface of the side cheek 2, and is guided on two pins A (Fig. 3) fixed in the side cheek 2, and projecting through slots A' , on the slide a . The slide a is provided with an opening a^5 , which, when the slide is in position comes opposite the slot h^4 , in the side cheek (see Fig. 3). The pin h^3 , mentioned above thus presses against the side of the opening a^5 , and draws the slide a , from right to left in Fig. 3. The slide a , is provided with a bar b , extending at right angles to the slide and across the sectors 3. When the slide is moved as described, the bar b enters the teeth of the sectors and locks them against further movement. This locking operation is initiated before the actual impression and is completed simultaneously with the completion of the printing. The bar b , thus, not only locks the sectors but assures the alinement of the printing. This completes the actual printing operation, after which, as will be understood, the bar b , leaves the type sectors locked.

Adding.—During the printing operation, the adding lever 10, has been locked, but at the completion, the adding lever or handle 10, is released. The handle 10, is fixed to the shaft 1, and on the same shaft there is fixed a composite cam r , as well as the usual operating cam 11. The cam r , is provided with a rim r^2 , having a projection r' . Normally, when the machine is idle, the projection r' rests against the arm q^2 of a lever q , pivoted at q^3 . The lever q , is also provided with an arm q' , which rests on the raised part p' , of a segment p , mounted on the printing shaft 44. The segment p , is arranged at the opposite side of the machine to the printing lever 43, (see Figs. 8, 9 and 11). When the printing lever 43, is operated, the segment p , moves from the position shown in full lines in Fig. 9, to the po-

sition shown in dotted lines, whereby the arm q' , falls by gravity in the form shown on to the part of the segment p , of smaller radius. This causes the arm q' , to move away from contact with the projection r' . The arm q^5 , of the lever is provided for co-acting with a spring which is not illustrated in the drawings. As will be seen from Fig. 9, the shaft 1, and handle 10, can only be rotated in one direction on account of the detent ratchet and pawl s' and s , the ratchet wheel s' , being fixed on the shaft 1, while the pawl s , is carried by the housing 2^a . As soon as the arm q^2 drops from the projection r' , the shaft 1, may be rotated counter-clock-wise in Fig. 9. When the shaft 1 is rotated, the operating cam 11 is carried around with it and this cam coöperates with a mechanism known in itself, and which forms no part of the present invention, to rotate the pinion 7, which is fixed to rotate with the arm 6. The arm 6, as is known carries a pin 8, projecting through slots in all the sectors and returns these sectors to their normal position. This mechanism is well known, and is not illustrated in the drawings. The rotation of the cam r , oscillates a lever 15 (see Fig. 8) which brings the adding mechanism into engagement with the teeth 3, of the sectors. The arm 15, is mounted on a shaft 13 which passes through the casing and has fixed to it side cheeks which carry the zeroizing counting and tens carrying mechanism, the first counting wheel being illustrated in Fig. 6. The method has been described by means of which the operating handle is locked and released and the initial operation of the operating handle as described brings the counting mechanism into engagement with the sectors 3, by means of the cam r , and then returns the sectors by means of the cam 11, both of which cams are mounted to rotate with the shaft 1. As the cam r , rotates, the projection r' moves around till it engages the arm q^4 . When the projection r' , co-acts with the arm q^4 , the lever q is brought back to the position illustrated in full lines in Fig. 9. The printing lever 43, as will be understood, has been held in the position shown in Fig. 4, by the arm q' , engaging on the shoulder p' , of the segment p . As soon however as the projection r' raises the arm q^4 , and thereby the arm q' , the segment p' , and lever 43, spring back under the action of the spring 49.

As mentioned at the close of the description relating to the printing mechanism, the sectors 3, are locked by the bar b . The initial movement of the handle 10, is utilized not only to operate the arm 15, but also to move back the slide a . The operation is such that the slide a , is moved back simultaneously with the operation of the arm 15. For the purpose of moving back the slide a ,

the shaft 1 is provided with a cam z , shown in dotted lines in Fig. 3, and shown in full in the plan view, Fig. 11. The cam z , is provided with a nose z' , which as shown in Fig. 5, normally is at rest under a pin a^4 , fixed to the slide a . When the shaft 1, is rotated the nose z' , engages the pin a^4 , and moves the slide from left to right in Fig. 5, and thereby draws the bar b , with its nose b' , out of engagement with the teeth of the sector 3. Simultaneously with the bar b , moving out of engagement with the sectors 3, the counting mechanism is moved into engagement with these sectors by means of the arm 15. The cam z extends over a suitable arc so as to insure that the slide a , will not slip back by any vibrations which may be imparted to the machine.

According to this invention the operation of carrying the tens is effected while the counting mechanism is in engagement with the toothed sectors. This method of operation is not broadly new. It is because of this method of operation that the cam r , shown in Fig. 12, is of circular form for such a large part of its circumference. It will be understood therefore that the finger pieces 4, are all returned to their zero position by the operation of the cam 11. If now any tens have to be carried, it is clear that the fingers 4, must be capable of moving one step behind their zero position. To enable this, the slots in the casing for the finger pieces 4, are continued rearwardly for a short distance and in their zero positions the finger pieces 4, rest against a transverse rest bar w . The transverse rest bar w , is carried by a lever pivoted at w' , and having a depending arm w^2 (see Figs. 2 and 7). The depending arm w^2 , is arranged in the path of the projection r^2 on the cam r . When the projection r^2 leaves the circular part w^3 , on the interior edge of the depending arm w^2 , the arm w^2 , swings clockwise in Fig. 7, under the action of the weight of the bar w . The finger pieces are all brought to their zero position while the projection r^2 is still in engagement with the circular part w^3 , and the operation of tens carrying commences as soon as the projection r^2 leaves the circular part w^3 . The necessary freedom of motion for the finger pieces 4, is thus provided for. When the rotation of the shaft 1 is completed the projection r^2 , again comes to bear on the bottom of the circular part w^3 of the lever w^2 , and thereby restores the finger pieces 4, to their zero position.

Totalizing and zeroizing.—As mentioned above, the counting mechanism is normally out of engagement with the sectors. In this position zeroizing is effected merely by rotating the zeroizing handle 37. The zeroizing handle 37, has a hub plate d , provided with a flange broken at d' , so as to allow the hub plate to pass over a pin e , fixed in the

side cheek of the casing. The zeroizing shaft 23, and the handle 37, are mounted to move with the counting mechanism in the known manner. Thus at every operation of adding, the opening d' , permits the motion of the hub plate d , over the pin e . As shown the pin e is cut away on one side to permit of the rotation of the handle 37 when the apparatus is at rest.

For the purpose of totalizing the counting mechanism is moved into engagement with the sectors 3, by means of a lever c . The lever c , is provided with a projecting arm carrying a nose piece c' , adapted to engage a pin c^2 , on one of the side cheeks of the counting mechanism (see Fig. 6). The nose c' is also adapted to engage the edge a' of the slide a , (see Fig. 3). The slide a , is thus moved from right to left in Figs. 3 and 5, so as to bring the nose b' , of the bar b , into engagement with the teeth of the sectors 3. At the same time, the hub d , and the zeroizing and totalizing arm 37 is moved over the pin e , into the position shown in Fig. 6. In this position it is rotated. As will be readily understood the rotation of the arm 37, brings the counting mechanism into position with the figures all registering zero. The zeroizing mechanism is not novel and for the sake of simplicity is omitted from the drawing. In consequence of this, the sectors 3 are moved through amounts corresponding to the total. To enable the sectors 3, to move the bar b , the slide plate a , must be withdrawn from engagement with the teeth 3. This is effected by means of a cam f , mounted on the zeroizing shaft 23. The cam f is provided with a piece f' , which on rotation of the shaft 23, engages the nose piece a^2 , on the plate a , and thereby moves the plate a from left to right in Fig. 5. The sectors 3 are then rotated to bring them into the position to register totals, whereupon the total is printed by the operating printing lever 43. Toward the end of the rotation of the shaft 23, a pin g on the cam f , engages the end a^3 , of the plate a , and thereby moves the slide a , into locking position after the sectors have been set to register the total. During the printing operation in this case therefore, the slide a will not require to be operated by the pin h^3 . For the purpose of holding the arm 37 in its normal zero position d' opposite the pin e , a spring 37^a with a projecting rib 37^b is fixed to the side cheek of the machine.

Summing up, it will be seen that the slide a , controls the sequence of operations as follows:—At printing, the lever 43 is operated to print and bring the locking slide a , into engagement with the sectors. This operation also releases the means (the lever q) for locking the operating handle. The rotation of the operating handle 10 now releases the locking slide a , and simultane-

ously brings the counter mechanism through the lever 15, into engagement with the toothed sectors.

What I claim and desire to secure by Letters Patent is:—

1. An adding machine comprising toothed sectors, means for setting the sectors by hand, counting mechanism, a totalizing lever, counting wheels to engage the sectors and to be thrown into engagement with the sectors when the totalizing lever is moved, a zeroizing handle movable with the counting wheels, a locking bar for the toothed sectors operated by the counter lever when the counting wheels are thrown into engagement with the sectors, said locking bar being released when the zeroizing handle is turned, and means for causing the locking bar to reengage the sectors as the zeroizing handle completes its rotation.

2. An adding machine comprising toothed sectors, means for setting the sectors by hand, counting mechanism, a totalizing lever, counting wheels to engage the sectors and to be thrown into engagement with the sectors when the totalizing lever is moved, a zeroizing handle movable with the counting wheels, a locking bar for the toothed sectors operated by the totalizing lever when the counting wheels are thrown into engagement with the sectors, said locking bar being released when the zeroizing handle is turned, means for causing the locking bar to reengage the sectors as the zeroizing handle completes its rotation, and an operating handle having means thereon for finally releasing the locking bar.

3. In combination the toothed sectors, means for operating them by hand, adding means cooperating with the sectors, printing mechanism cooperating with the sectors, a locking bar operated by the printing mechanism to lock the sectors and an operating handle having means thereon for moving the locking bar out of engagement with the sectors.

4. In combination the toothed sectors, means for setting the same by hand, adding mechanism cooperating with the sectors, printing mechanism, a lever therefor, an operating handle and means for causing the lever to lock itself and unlock the handle

when said lever is moved, and the said handle to unlock the lever when the handle is moved.

5. In combination the toothed sectors, levers for setting the same by hand, adding mechanism cooperating with the sectors, an operating handle for the sectors and adding mechanism, a pivoted rest bar for the setting levers, and means operable from the operating handle for actuating said bar.

6. In combination, rotatable toothed sectors, hand setting levers for said sectors, adding mechanism, means for temporarily bringing said adding mechanism in engagement with said sectors, a movable rest bar for said setting levers, and means for moving said rest bar just before said adding mechanism passes from engagement with said sectors.

7. In an adding machine, rotatable toothed sectors, type on said sectors, printing mechanism, an operating lever for causing said printing mechanism to cooperate with said type, a locking slide operable by said lever to lock said sectors, an operating handle for the adding machine, means released by the movement of the printing lever, for locking said handle against rotation, and means operable from said handle for releasing the locking slide.

8. In combination, rotatable toothed sectors, hand setting levers for said sectors, adding mechanism, means for temporarily bringing said adding mechanism into engagement with said sectors, a movable rest bar for said setting levers and means for moving said rest bar just before said adding mechanism passes from engagement with said sectors.

9. In combination, adding mechanism, a locking device therefor and operable therefrom, printing mechanism, a printing lever a pivoted member operable from said printing lever and actuating said locking device, and an inking pad also operable from said pivoted member.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN MESNY TOURTEL.

Witnesses:

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