

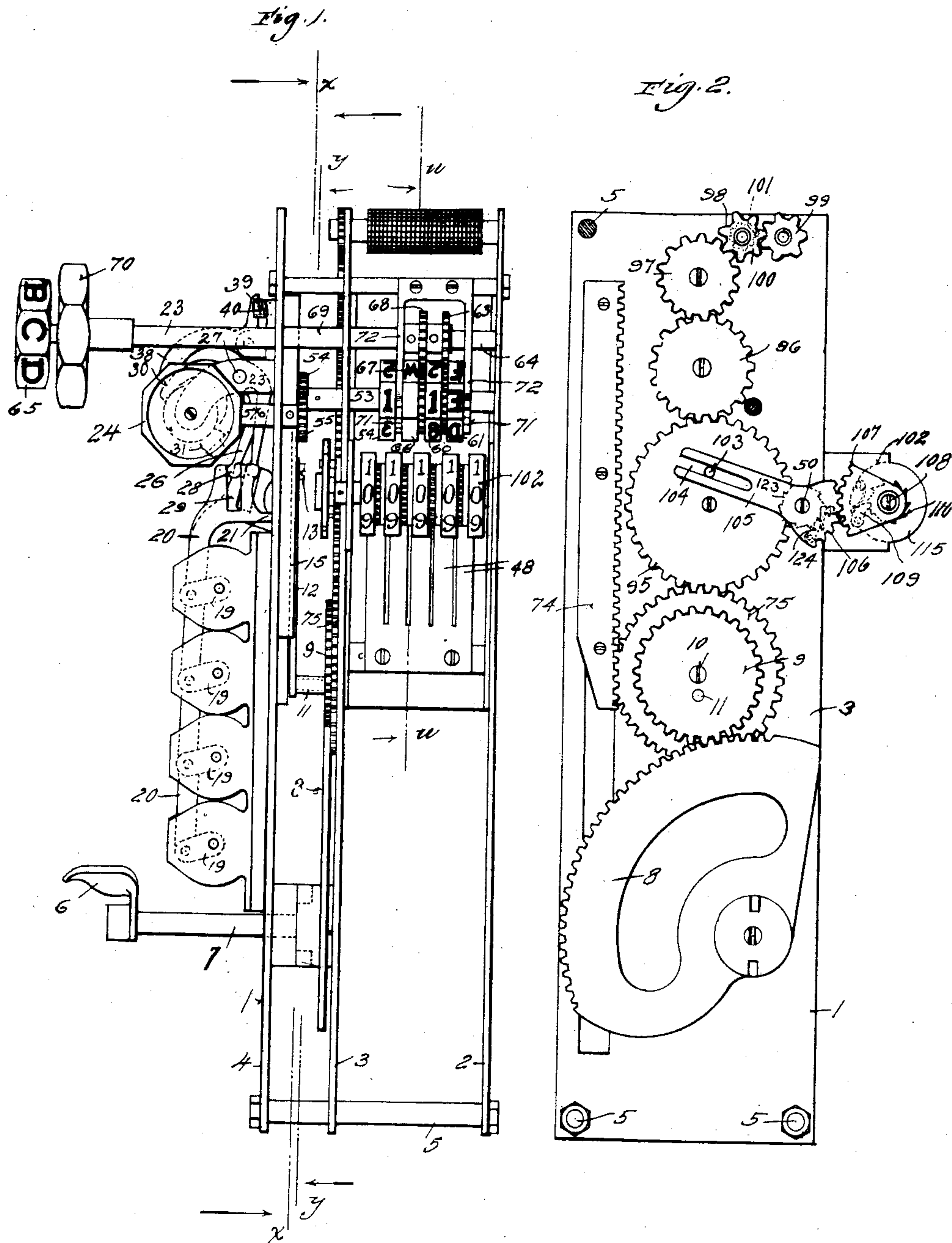
No. 867,592.

PATENTED OCT. 8, 1907.

W. I. OHMER.
FARE REGISTER.

APPLICATION FILED FEB. 9, 1903.

4 SHEETS—SHEET 1.



WITNESSES.

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Will O. Laughlin

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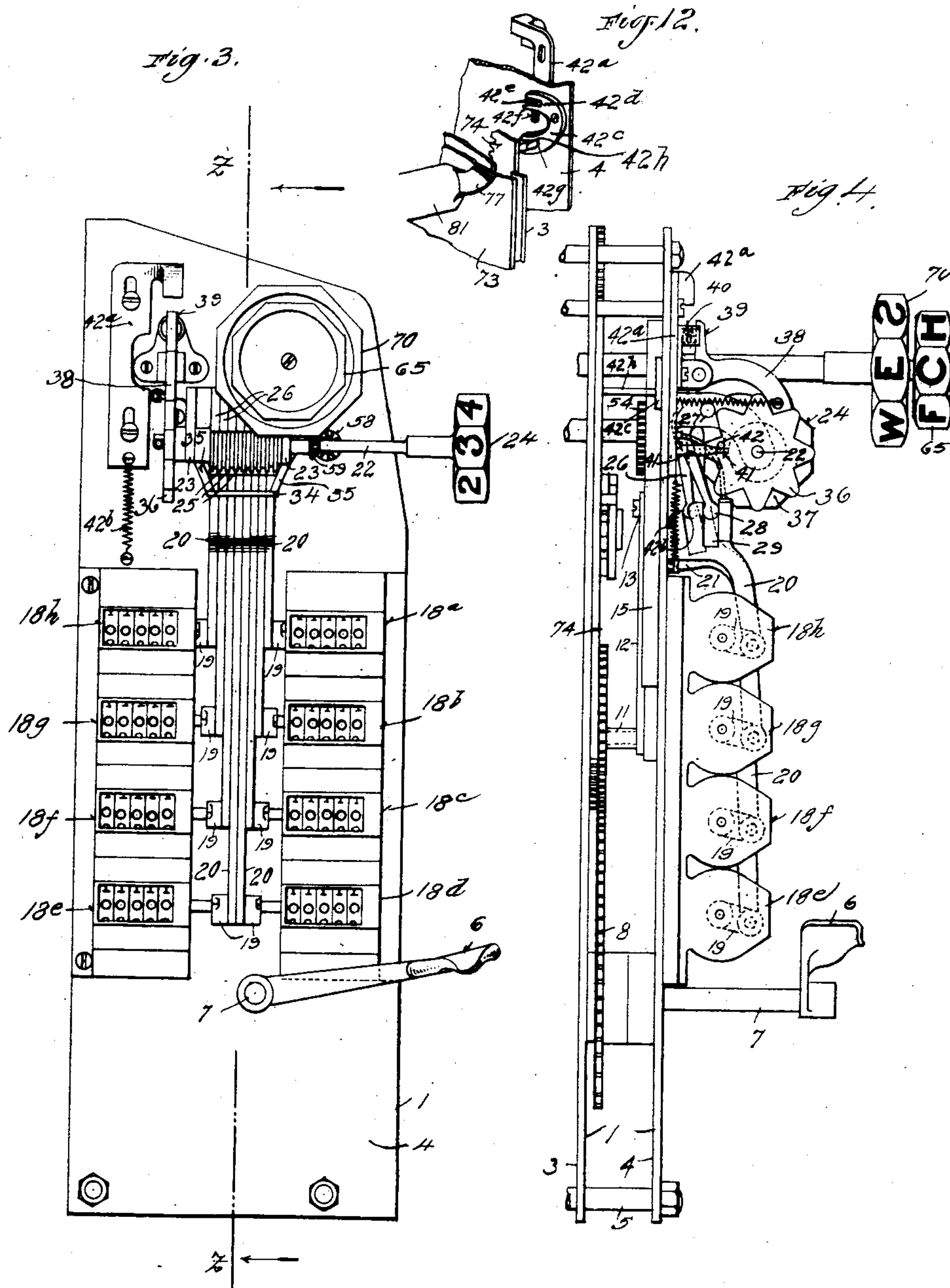
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 5.

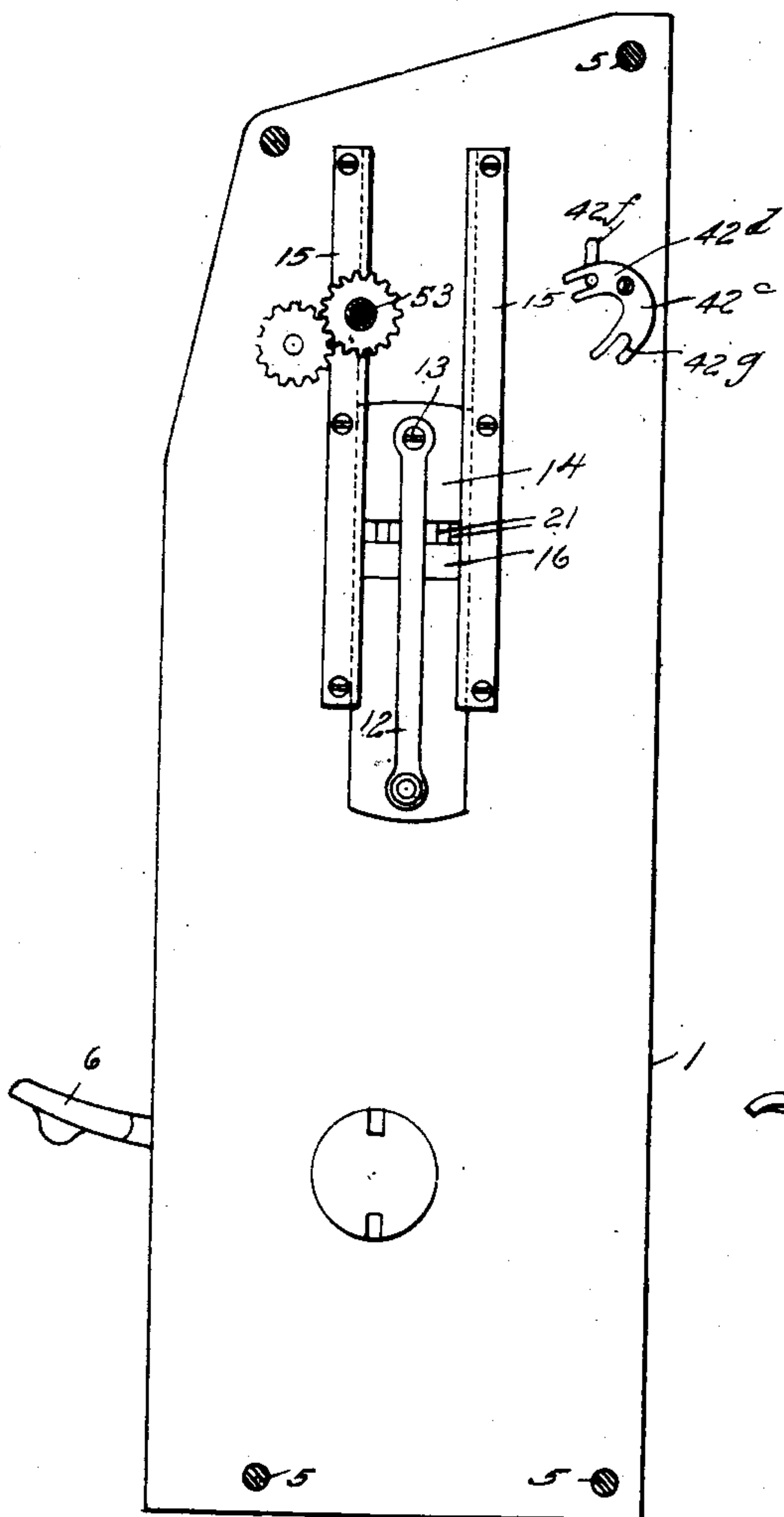


Fig. 6.

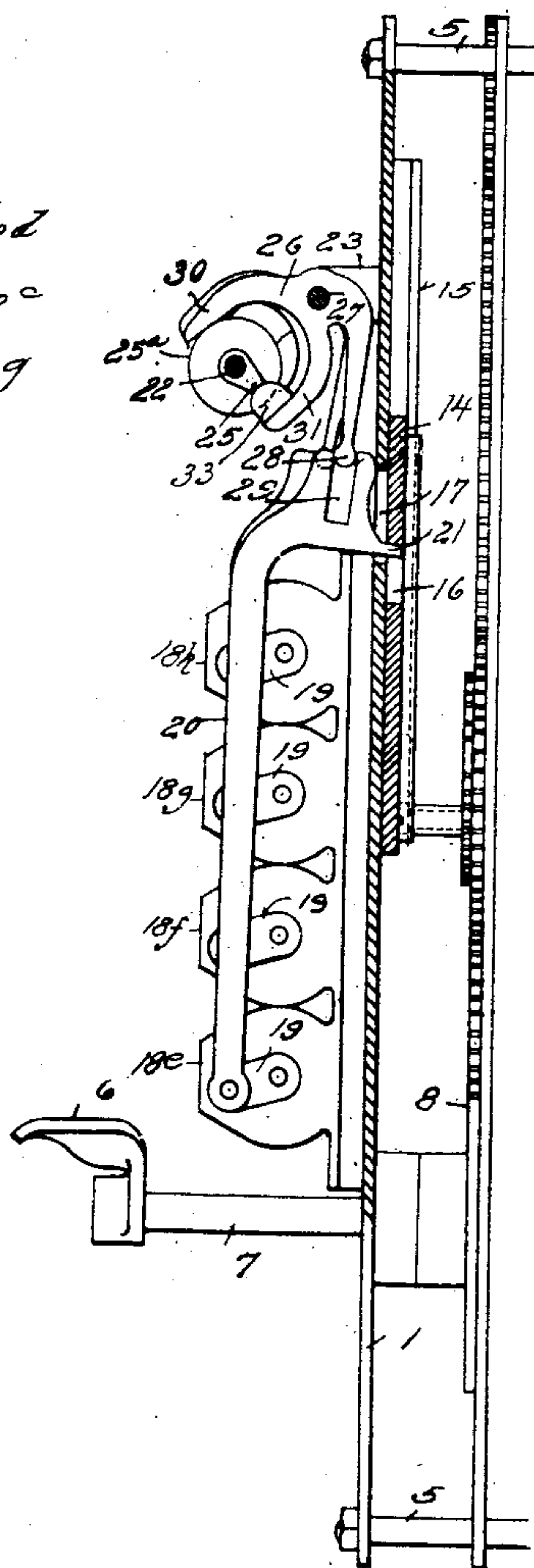
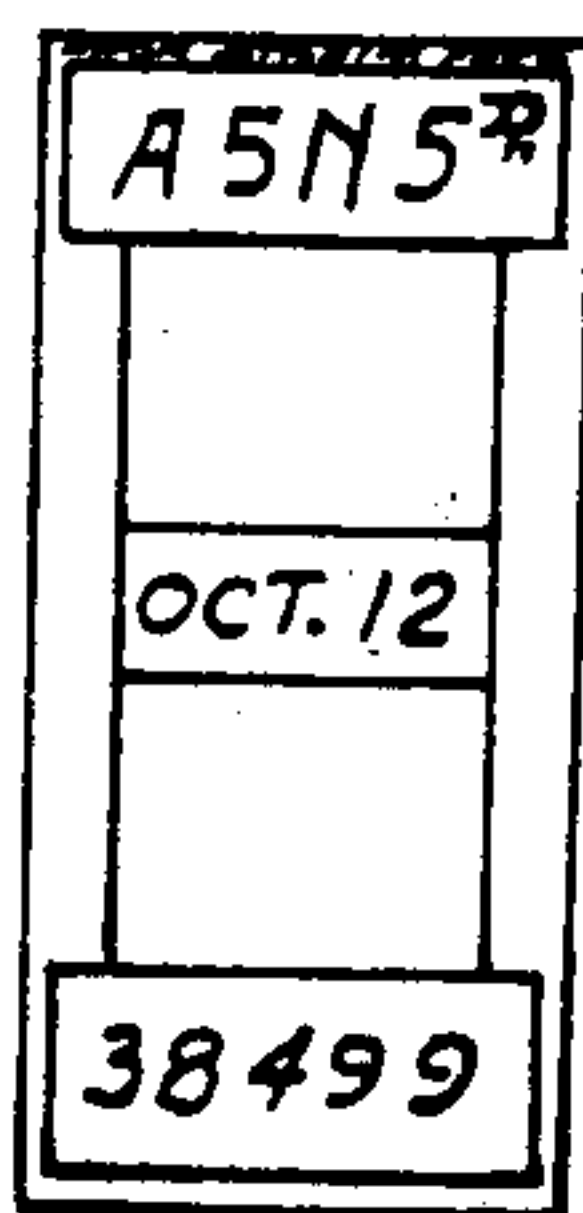


Fig. 16.

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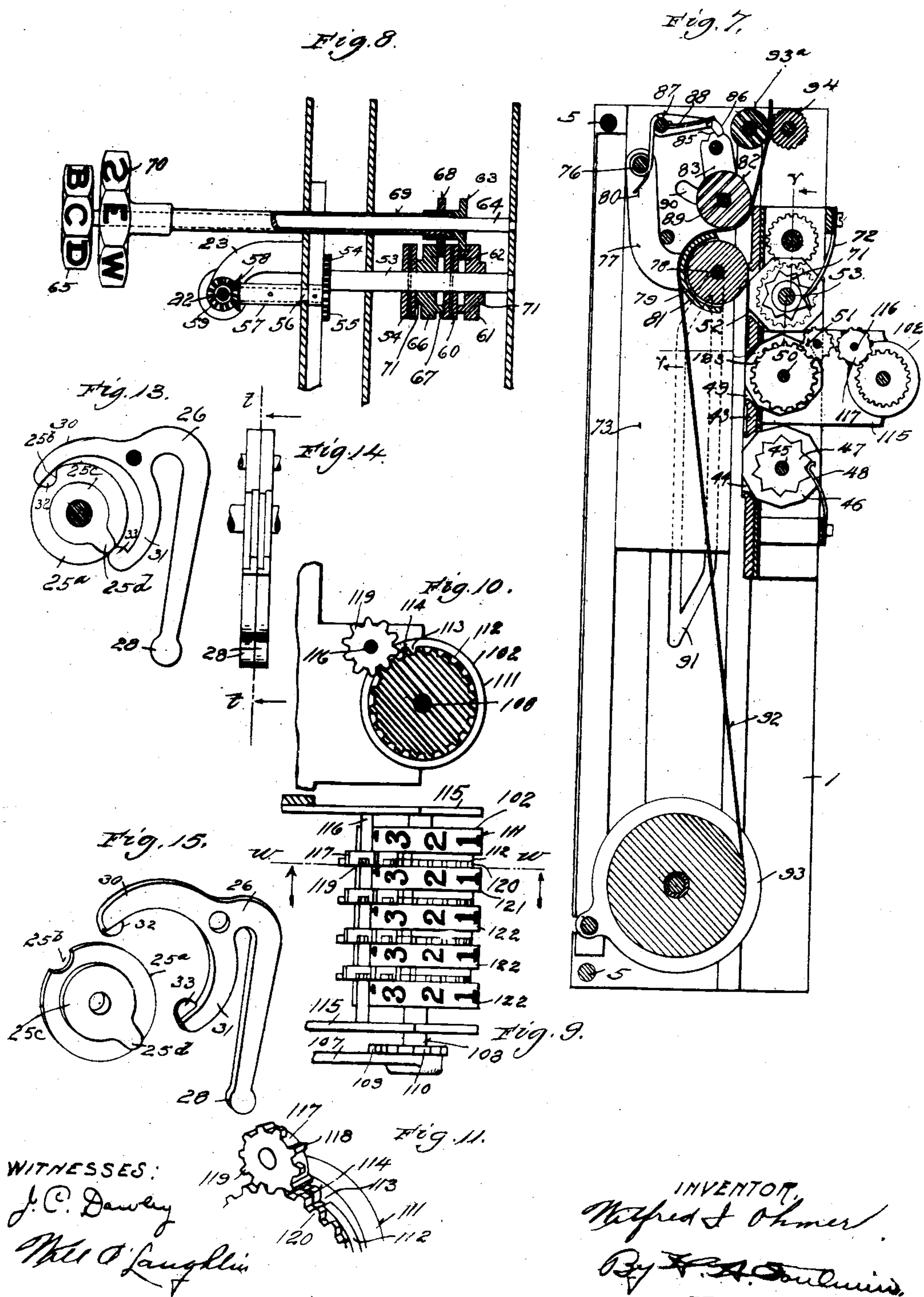
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4 SHEETS—SHEET 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILFRED I. OHMER, OF DAYTON, OHIO, ASSIGNOR TO THE RECORDING AND COMPUTING MACHINES COMPANY, OF DAYTON, OHIO.

FARE-REGISTER.

No. 867,592.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed February 9, 1903. Serial No. 142,523.

To all whom it may concern:

Be it known that I, WILFRED I. OHMER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Fare-Registers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to fare registers, and has for its object, primarily, to provide a fare register adapted for use where fares of different values are to be registered, or, in other words, where each fare payment may consist of one fare unit or a number of fare units greater than one.

A fare register embodying my invention comprises a plurality of registers or counters operating therein, and setting mechanism whereby the operating mechanism is caused to operate that one of the registers or counters corresponding with the fare or number of fare units paid, there being a separate register or counter for each fare or number of fare units.

In its preferred form, my improved fare register also comprises a register or counter for registering the total number of fares paid, irrespective of the value or amount of each individual fare.

To these and other ends my invention consists in certain novel features which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a view of a fare register embodying my invention in one form, the casing being removed; Fig. 2 is a sectional view of the same, taken on the line *a a* of Fig. 1, and looking in the direction of the arrows; Fig. 3 is a side elevation, viewed from the left hand of Fig. 1; Fig. 4 is a rear elevation of a portion of the mechanism; Fig. 5 is a sectional view, taken on the line *y y* of Fig. 1, and looking in the direction of the arrows; Fig. 6 is a sectional view, taken on the line *z z* of Fig. 3, and looking in the direction of the arrows; Fig. 7 is a sectional view, taken on the line *u u* of Fig. 1, and looking in the direction of the arrows; Fig. 8 is a detail sectional view, taken on the line *v v* of Fig. 7, and looking in the direction of the arrows; Fig. 9 is a detail plan view of the total fare register; Fig. 10 is a detail sectional view, taken on the line *w w* of Fig. 9, and looking in the direction of the arrows; Fig. 11 is a detail perspective view of a portion of the structure shown in Figs. 9 and 10; Fig. 12 is a detail view, illustrating the connection between the printing carriage and the locking device of the setting mechanism; Fig. 13 is an enlarged detail view, in front elevation, of a portion of the setting mechanism, the same being in section upon the line *l l* of Fig. 14; Fig. 14 is an enlarged detail view of the elements shown in Fig. 13, viewed from the same side

of the machine as shown in Fig. 3; Fig. 15 is a detail perspective view of one of the setting levers and its cooperating cam; and Fig. 16 is a view of the ticket issued by the machine.

For the purpose of illustrating my present invention, I have chosen what is known as a portable fare register, being one carried by the conductor or collector in any convenient way, but it will be understood that the main features of my invention are not limited in their application to such portable registers. It should be borne in mind therefore that the device which I will now proceed to describe is but one embodiment of my invention.

In this particular structure, I indicate a supporting frame. This frame consists, preferably, of three parallel vertical plates, 2, 3 and 4, suitably spaced apart by connecting bolts and sleeves 5, as usual in structures of this class. 6 indicates the operating lever by means of which all of the mechanisms of the register are operated after being properly set, this lever being mounted on a shaft 7, supported in the frame and carrying a gear segment 8, which meshes with a gear 9, mounted on a stud or axis 10, projecting from the plate 3. The lever 6 is operated by a vibratory or oscillating movement through the arc of a circle, first downward and then upward, and through the segment 8 it imparts a rotary motion to the gear 9, first in one direction and then in the other. The gear 9 is provided with an eccentric or crank pin 11, to which is pivotally connected the lower end of a pitman or connecting rod 12, the upper end of which is pivoted at 13 to a plate 14, sliding in ways 15 on the inner face of the plate 4. The plate 14 is provided with a transverse slot 16, and the plate 4 is provided, adjacent to the line of travel of the slot 16, with a similar slot or opening 17.

Mounted on the outer face of the plate 4 are a plurality of registers or counters, eight being shown in the present instance, and indicated by the reference numerals 18^a to 18^h, inclusive. The number of these registers may, of course, be varied according to the number of different fares, or the highest number of fare units which the machine is intended to register. In the present instance, it will be assumed that the register 18^a is to register all fares of the lowest rate received, for instance, all fares consisting of a single fare unit, the register 18^b registering all fares received consisting of two fare units, and so on to the register 18^h, which is to register all fares received consisting of eight fare units. Each register or counter is provided with the usual operating arm 19, to which is connected an operating rod 20, extending upward therefrom. The register operating arms 19 are offset, as shown in Fig. 3, so that the operating rods 20 lie compactly side by side

in parallel planes. Each operating rod 20 is provided at its upper end with a projection 21, lying in front of or within the opening 7 in the casing, and adapted to be projected through said opening, so as to engage the slot 16 in the sliding plate 14. It will be seen that, when any one of the operating rods 20 is thus moved inward at its upper end so as to be engaged by the sliding plate 14, the corresponding register or counter will be operated by a complete movement of the plate 14, so as to operate the corresponding register or counter and add one to the number indicated thereby.

The mechanism for engaging the operating rod of any given register with the operating slide 14 consists of a shaft 22, mounted in suitable bearings in brackets 23, projecting from the outer side of the plate 4. The shaft 22 extends at its front end through the casing and receives on the exterior thereof an operating and indicating wheel 24, which, in the present instance, consists of an octagonal hand wheel adapted to be grasped by the fingers of the conductor, and carrying on its eight peripheral faces the numerals from 1 to 8, inclusive, to indicate corresponding fares. In the present instance, where the register is a portable register suspended from the person of the conductor, the uppermost numeral is used to indicate the number of fare units, but any suitable external indicating device may be employed. The shaft 22 is provided with a plurality of cams 25, corresponding in number with the registers 18^a—18ⁿ, there being eight cams in the present instance.

As shown in detail in Fig. 15, each cam consists of a disk-like portion 25^a, having a peripheral notch 25^b, and a second disk-like portion 25^c, of smaller diameter, provided with a peripheral projection 25^d. In connection with each cam 25 and lever 20 there is employed a setting lever 26, the several setting levers being pivoted on a common axis 27, supported by the brackets 23. Each setting lever 26 terminates at one end in a toe, 28, which engages a slot 29 in the upper end of the corresponding operating rod 20. The other end of each setting lever 26 is bifurcated, forming arms 30 and 31, which embrace between them the corresponding cam 25. The arm 30 is provided, on one side of the median plane of the lever 26, with a projection 32, which fits the notch or recess 25^b in the periphery of the enlarged portion 25^a of the cam 25. The other arm, 31, of the lever 26 is provided, on the opposite side of the median plane of the lever, with a projection 33, which lies in the path of the projection 25^d of the smaller part 25^c of the cam 25. The cams 25 are arranged spirally or in an offset relation on the shaft 22 to which they are secured, each cam having its projection and recess one-eighth of a revolution in advance of the succeeding cam, so that, as the shaft 22 is turned, the setting levers 26 will be successively operated at each one-eighth of a revolution to bring the corresponding operating rods 20 successively into position to be engaged by the operating slide 14. The distance between the projections 32 and 33 is such that, when these projections rest respectively in the recess 25^c and on the projection 25^b of the corresponding cam, the corresponding operating rod will be held in operative position, but in all other positions of the corresponding cam, said operating rod will be held in inoperative position, and only one operating rod can be held in operative position at a time. Thus, by turning the wheel 24 to indicate any desired

number of fare units, a complete movement of the main operating lever 6 of the fare register will add one to the total indicated by the corresponding counter or register of the series 18^a—18ⁿ.

In order to provide against overthrow or excessive movement of the operating rods 20, I employ a stop plate 34, extending over the upper ends of the rods 20 at or above their upward limit of motion, and supported from the plate 4 by arms 35.

In order to prevent overthrow of the shaft 22 and divide its rotation into readily perceptible divisions corresponding with the number of registers employed, I provide said shaft with a detent device, comprising a star wheel 36, secured on the rear end of the shaft 22, and provided, in the present instance, with eight notches 37, which are successively engaged by a detent pawl 38, which presents a certain amount of resistance to the turning of the shaft 22, which resistance may be, however, overcome by extra force exerted on the wheel 24. The detent pawl 38 is provided with a projection 39, under which is located a spring 40, which holds it in engagement with the detent wheel 36. This detent pawl and wheel permit rotation of the shaft 22 in either direction, but rotation of said shaft beyond one complete revolution is prevented by means of a stop pin 41, mounted on the plate 4 and lying in the path of a corresponding stop pin 42, projecting from the detent wheel 36.

In order to lock the setting shaft during the operating movement of the register, I employ a locking plate 42^a, normally drawn by a spring 42^b under the heel 39 of the detent 38, but freed from such engagement, except when the register is operated, by a bell crank lever 42^c, pivoted on the plate 4 and having a slotted end 42^d, engaging a pin 42^e, extending from the locking plate 42^a through a slot 42^f in the plate 4. The other end of the lever 42^c is slotted at 42^g to receive a pin 42^h on the rack of the printing carriage hereinafter referred to. When said carriage is in its normal position, it holds the locking plate out of engagement with the detent 38, and permits the operation of the setting mechanism. While the register is being operated, the spring 42^b holds the locking plate in position to prevent movement of the setting mechanism.

As heretofore stated, I prefer to employ, in conjunction with the variable fare registering mechanism hereinbefore described, means for printing and issuing a ticket, and also means for registering the total number of fares paid and of tickets issued. This mechanism, in its preferred form, comprises a fixed printing plate 43, having thereon printing characters, by means of which any suitable legend may be printed on the face of the ticket. This printing plate has formed in it a slot or opening 44, across which extends a shaft 45, on which are mounted date printing wheels 46, which may be set in any convenient manner to print the correct date, and which are held in position when so set by a detent wheel 47 and locking detents 48 for each wheel. Above the slot 44 the printing plate 43 is provided with a second slot or opening 49, across which extends a shaft 50, on which are mounted a series of consecutive number printing wheels 51, operated by the movements of the printing and issuing mechanism in the manner hereinafter described. Above the opening or slot 49 the printing plate 43 is provided with a third slot or

opening 52, across which extends a shaft 53, on which are mounted the printing wheels which print the amount of the fare or number of fare units, the stations, and the direction of travel. In the present instance, I have shown four of these wheels, one of which, marked 54, prints the amount of fare paid. This wheel is secured on the shaft 53, so as to move therewith, and said shaft 53 is provided with a gear 54, which meshes with a gear 55 on a shaft 56, mounted in a bearing sleeve 57, carried by the plate 4. The shaft 56 is provided at its outer end with a bevel pinion 58, which meshes with a similar pinion 59 on the shaft 22. The construction is such that, when the shaft 22 is turned by means of the hand wheel 24 to set it to any given fare or number of fare units, thereby rendering operative the corresponding register, the printing wheel 54 is turned into position to print the corresponding fare upon the ticket.

60 indicates a station printing wheel, also secured on the shaft 53, and indicating the number of stations from the initial station for which fare is paid. In the particular form of mechanism which I have chosen for purposes of illustration, the arrangement is such that the initial station is printed on the ticket, and the number of stations from the initial station for which fare is paid, the system being such that one fare unit is charged for travel between any two adjacent stations, so that the number printed by the wheel 60 is the same as that printed by the wheel 54. The station printing wheel 60 may, however, be otherwise operated, if desired.

61 indicates a station printing wheel, mounted loosely on the shaft 53, and adapted to print a character indicating the initial station. In the present instance, I have shown the letters of the alphabet, capital A, capital B, capital C, etc., as indicating the successive stations. The wheel 61 is provided with a gear 62, which meshes with a gear 63, secured on a shaft 64, extending through the casing and provided with an operating wheel 65 having characters thereon indicating the stations, so that the station printing wheel 61 may be turned by hand to indicate the initial station from which the fare to be registered is paid.

66 indicates a direction printing wheel, mounted loosely on the shaft 53, and provided with a gear 67, which meshes with a gear 68, secured to a sleeve 69, mounted loosely on the shaft 64. This sleeve also extends through the casing and is provided on its outer end with an operating wheel 70, carrying the same characters for indicating the direction of travel that are carried by the wheel 66. By this means, the direction printing wheel may be set to print upon the ticket the direction of travel of the trip for which the ticket to be printed is issued. The printing wheels 61 and 66 are provided with detent wheels 71 and detent springs 72 for locking them in the positions to which they may be set.

In connection with the printing plate and printing wheels, I employ a reciprocating carriage 73 for actuating the impression and inking rolls. This carriage slides in ways between the plates 2 and 3 and is provided with a rack 74, extending through a slot in the plate 3 and meshing with a gear 75, connected and moving in unison with the gear 9. In this way a reciprocating movement is imparted to the carriage 73.

The carriage is provided with a cross bar 76, on which are pivoted arms 77, in which the shaft 78 of the inking roller 79 has its bearings. Springs 80 serve to press the inking roller against the printing plate, and the back of said roller is covered by the usual guard 81 to prevent the paper from coming in contact with it. The carriage also carries an impression roller 82, which has its bearings in arms 83, pivoted to the carriage at 84. The upper end of each arm 83 is provided with a projection 85, with which engages a dog 86, pivoted to the carriage at 87 and controlled by a spring 88. These dogs will engage the projections 86 on either side thereof and will tend to hold the arms 83 in position at the limit of their motion in either direction. The impression roller shaft, indicated at 89, extends through curved slots 90 in the side walls of the carriage, and the ends of said shaft engage cam grooves 91, formed in the inner faces of the plates 2 and 3. These cam grooves are so shaped as to hold the impression roller in working relation with the printing plate during the downward motion of the carriage and to hold it away from the printing plate during the return motion.

The tickets are printed upon a strip of paper 92, mounted in the form of a roll upon a roll holder 93, and the strip passes over the guard 81 and under the impression roller 42, between it and the printing plate, being carried thence to the issuing rollers 93 and 94. These issuing rollers are driven, during the return movement only of the carriage, by means of a train of gears, 95, 96 and 97, from the gear 75. The rollers 93 and 94 are respectively provided with intermeshing gears 98 and 99. The shaft of the roller 93 carries a gear 100, meshing with the gear 97, and having between it and the gear 98 a pawl and ratchet device 101, by means of which an intermittent one-way motion is imparted to the issuing rolls 93 and 94.

It will be understood from the foregoing description that each operation of the operating lever 6 will print a ticket similar to that shown in Fig. 16, having thereon, in addition to the usual printed matter, the consecutive number of the ticket, the date, the direction of travel, the initial station of the ride for which the ticket is issued, the number of stations from said initial station for which the ticket is good, thus indicating the terminal station, and the amount of fare paid.

The machine is further provided with a total fare register, indicated as a whole by the reference numeral 102, which will indicate the total number of fares paid. This will coincide with the total number of tickets issued, so that the consecutive number printed on the ticket will correspond with the number shown by the total fare register. This total fare register is preferably operated from the gear 95, which is provided with an eccentric pin 103, which engages a slot 104 in a lever 105, mounted on the shaft 50, which carries the consecutive number printing wheels. The lever 105 is provided at its outer end with a gear segment 106, which meshes with a similar gear segment 107, mounted loosely on the main shaft 108 of the register 102. This gear segment carries a pawl 109, which engages a ratchet 110, secured on the shaft 108. On this shaft is secured a number indicating wheel 111, which turns with said shaft, and which carries a hub or disk 112, having a single notch 113 and a raised tooth 114 adjacent to said

shaft. The shaft 108 is mounted in bracket arms 115, and in said arms is mounted a fixed shaft 116, carrying a pinion 117, having on one side of its median plane a single tooth 118, coöperating with the notch 113 and tooth 114. On the other side of its median plane the pinion 117 is provided with a series of spur teeth 119, meshing with corresponding spur teeth 120 on a number indicating wheel 121, mounted loosely on the shaft 108. As shown, the tooth 118 forms a continuation or prolongation of one of the teeth 119. It will be readily understood that each complete revolution of the wheel 111 will advance the adjacent wheel 121 one step, and a series of number indicating wheels 122, similar to the wheel 121, are mounted side by side on the shaft to complete the register. In this way, each operation of the mechanism for registering a fare will be indicated by the register 102. The number printing wheels 51 are mounted and connected in a manner similar to the wheels of the register 102, and to this end, the shaft 50 is provided with a ratchet wheel 123 secured thereon, which is engaged by a spring pawl 124 on the lever 105, the lever being loosely mounted on the shaft 50. By this means, the consecutive numbering of the tickets is effected.

It will be seen that, considering the register as a whole, it can be set to correspond to the fare or number of fare units paid by any passenger, and that particular fare or number of fare units will be recorded on a separate counter or register, so that an inspection of the machine will show at once the total number of fares of each kind paid, these different fares being separately registered. In its complete form, the machine also shows the total number of fares paid, irrespective of the individual value of each fare.

I do not wish to be understood as limiting myself strictly to the precise details hereinbefore described and shown in the accompanying drawings, as it is obvious that these details may be varied without departing from the principle of my invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a variable fare register, the combination, with a plurality of registers or counters for registering the different fares, each counter being provided with an operating rod, of an operating member, an actuating part moving in a fixed path and operatively connected with the operating member, a setting shaft having a series of cams, and a corresponding plurality of setting levers operatively connect-

ing said cams and the corresponding operating rods, whereby any one of the operating rods may be moved into the path of the actuating part, substantially as described. 50

2. In a variable fare register, the combination, with a plurality of registers or counters for registering the different fares, each counter being provided with an operating rod, of an operating member, a slide connected with and actuated by said member, a setting shaft having a series of cams, and a corresponding plurality of setting levers operatively connecting said cams and the corresponding operating rods, whereby any one of the operating rods may be engaged with and actuated by said slide, substantially as described. 55 60

3. In a variable fare register, the combination, with a common operating member, of a total fare register for registering the total number of fares received, a plurality of independent registers or counters for registering the different fares, each having its own immediate operating device, and a setting mechanism comprising, first, a series of setting devices which permanently connect, respectively, with the operating device of each counter and, second, means for positioning at will any one of said setting devices to engage the immediate operating device of any one of said counters with said common operating member, substantially as described. 65 70

4. A fare register comprising a series of independent counters for counting separate classes of fares, an actuating device for each counter, an operating slide common to said actuating devices, and a series of setting cams, one for each actuating device, each of said cams when set moving its proper actuating device into operative relation with said common operating slide. 75 80

5. A fare register comprising a series of independent counters for counting separate classes of fares, setting cams, one for each counter, connected link and lever mechanism between each cam and its appropriate counter, and a common operating slide, each of said mechanisms being thrown into operative relation with said common operating slide by its appropriate cam. 85 90

6. A fare register comprising a series of independent counters for counting separate classes of fares, setting cams mounted on a common shaft, one for each counter, connected link and lever mechanism between each cam and its appropriate counter, and a common operating slide, each of said mechanisms being thrown into operative relation with said common operating slide by its appropriate cam. 95 100

7. A fare register comprising a series of independent counters for counting separate classes of fares, setting cams mounted on a common setting shaft, one for each counter, connected link and lever mechanism between each cam and its appropriate counter, and a common operating slide, each of said mechanisms being thrown into operative relation with said common operating slide by its appropriate cam. 100

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

WILFRED I. OHMER.

Witnesses:

W. H. H. ECKI,
A. A. BENIS.