(No Model.) 2 Sheets—Sheet 1.

J. W. FOWLER & D. F. LEWIS.

FARE REGISTER AND RECORDER.

No. 271,976. Patented Feb. 6, 1883.

Fig. 1

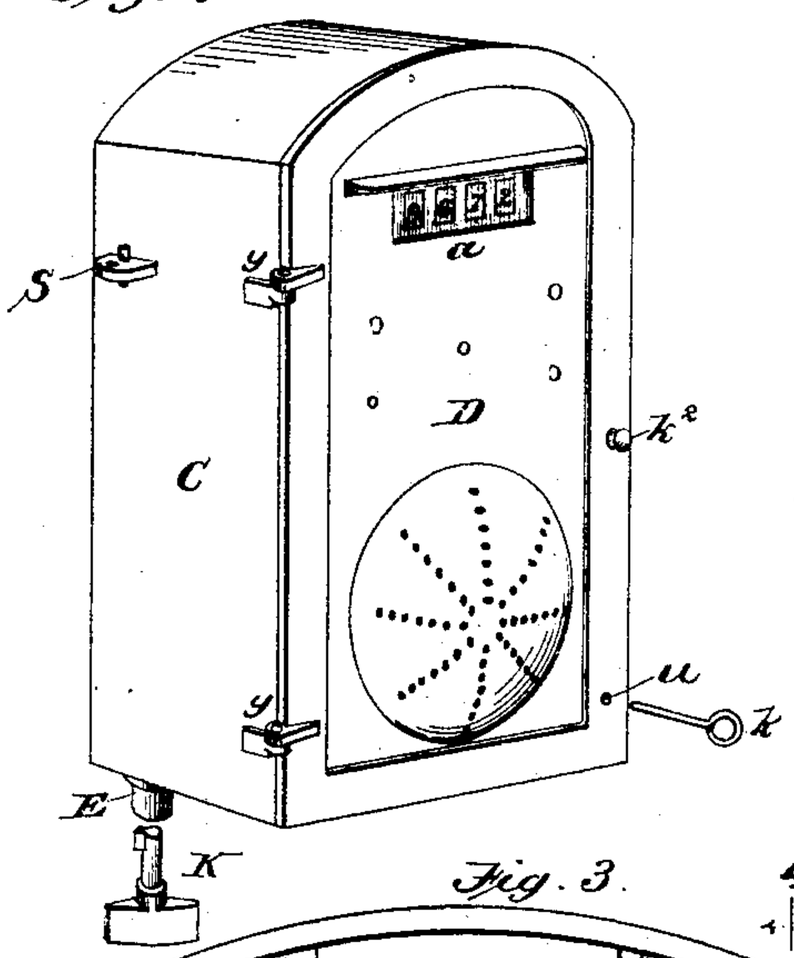


Fig. 2.

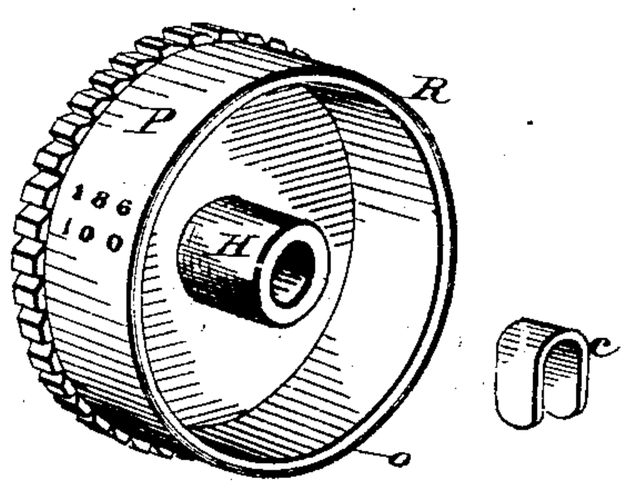


Fig. 3.

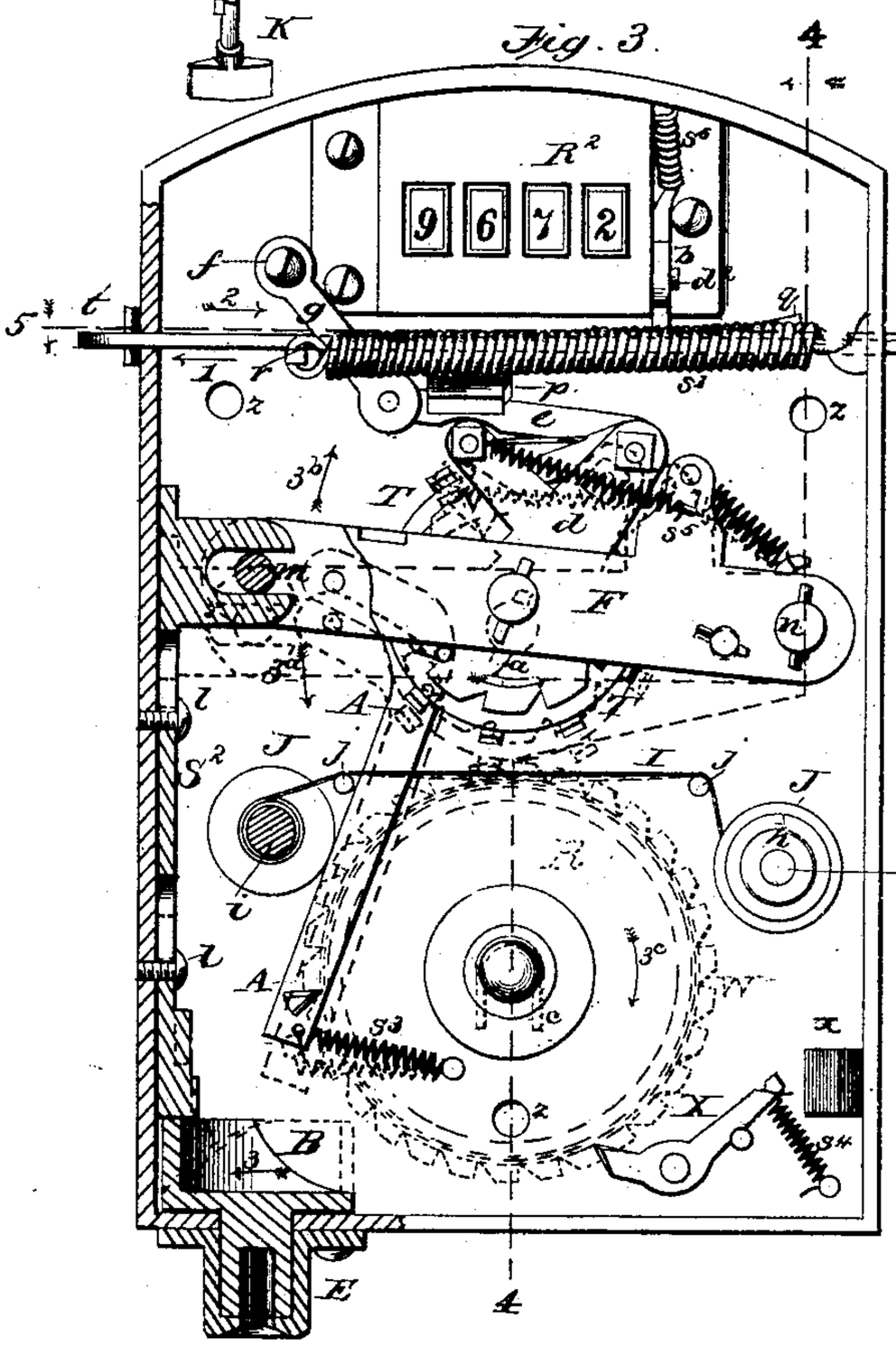
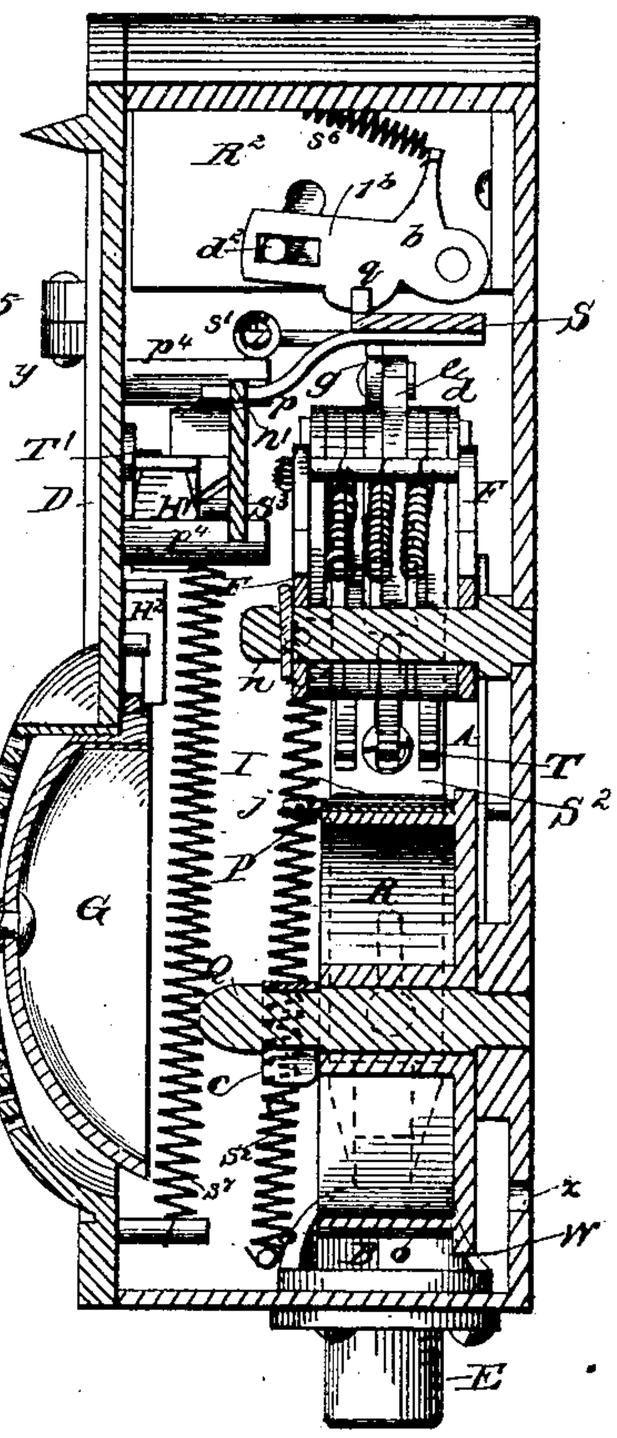


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5

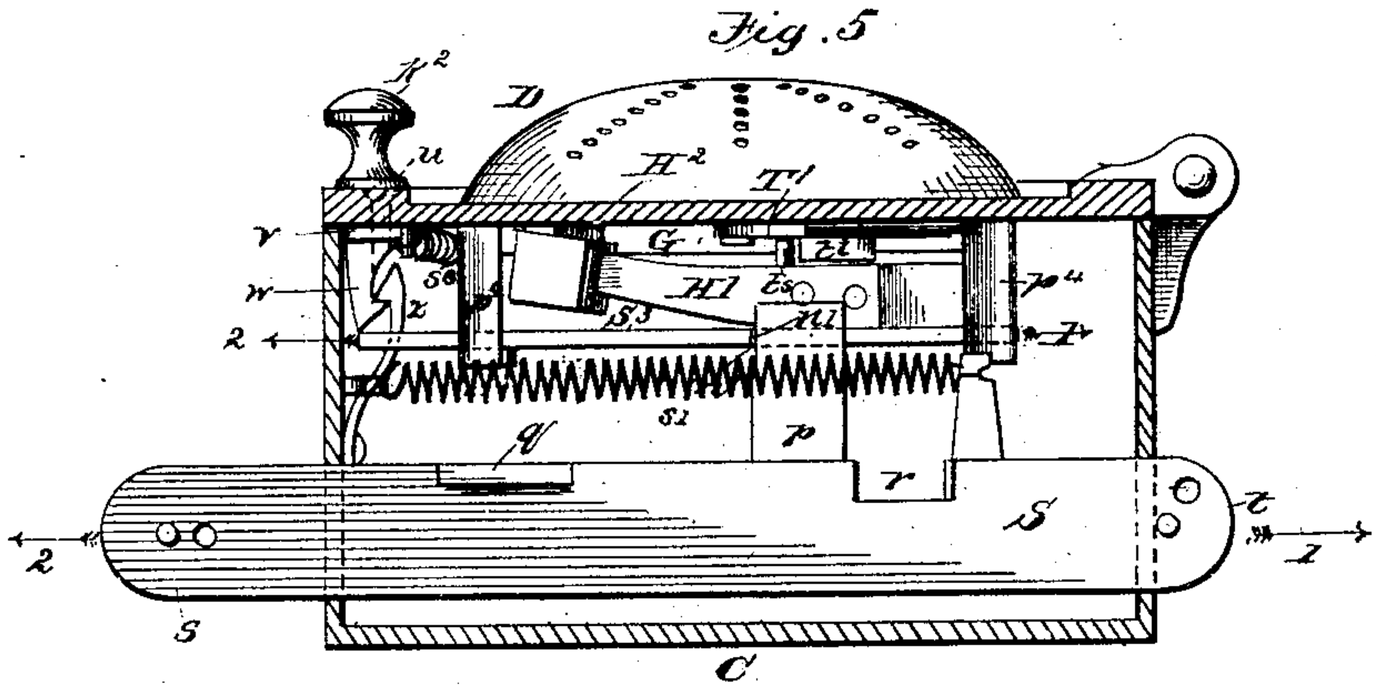


Fig. 6

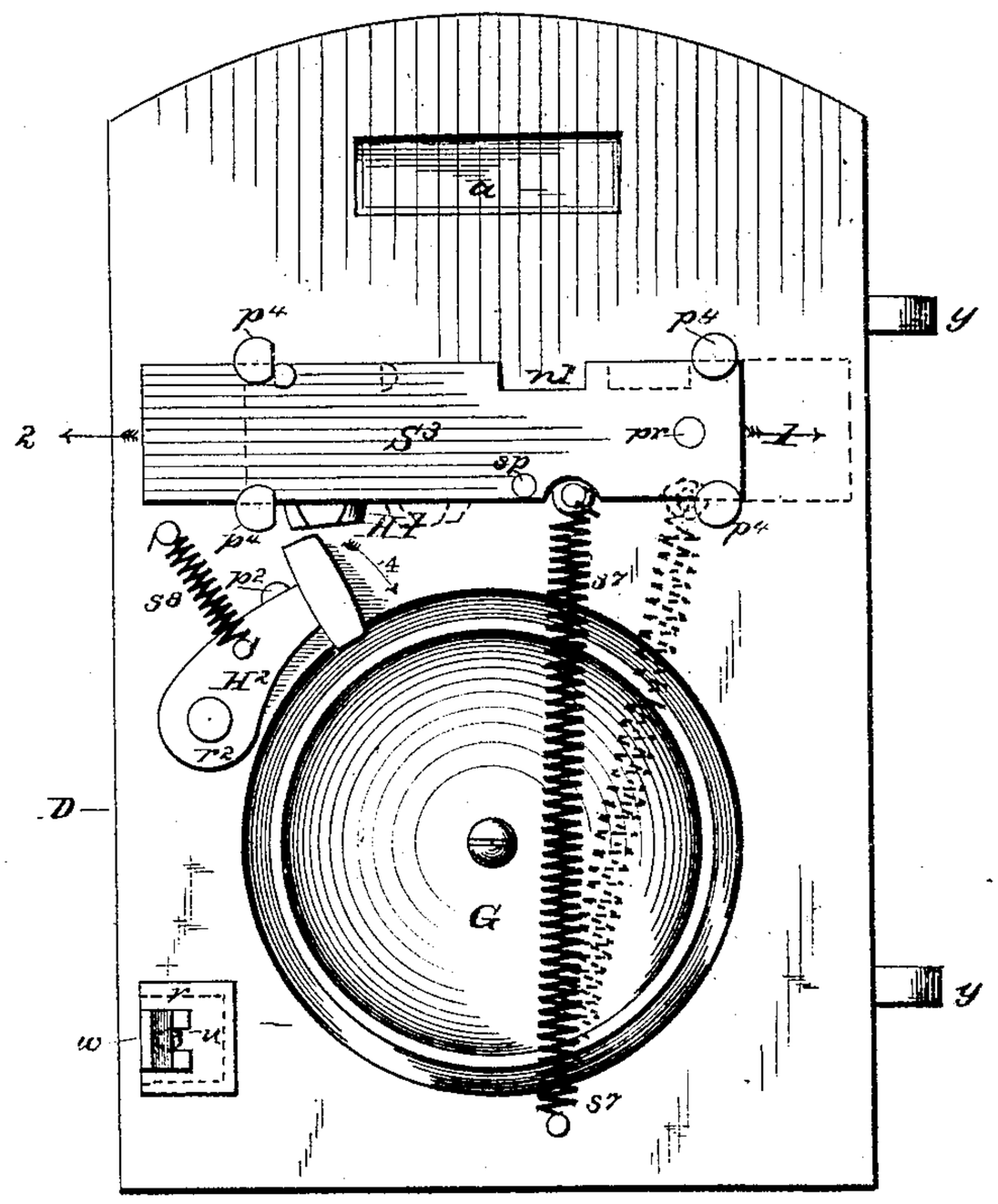
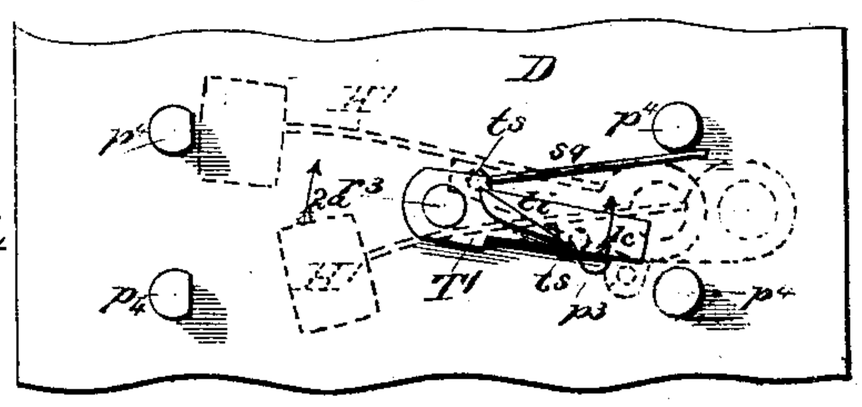


Fig. 7.



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FARE REGISTER AND RECORDER.

SPECIFICATION forming part of Letters Patent No. 271,976, dated February 6, 1883.

Application filed November 16, 1882. (No model.)

To all whom it may concern:

Be it known that we, JOHN W. FOWLER and DANIEL F. LEWIS, citizens of the United States, residing at Brooklyn, in the State of New York, have invented a new and useful Improvement in Passenger Registers and Recorders, of which the following is a specification.

Our present instrument or "machine" belongs to that class of mechanical apparatus for insuring thorough and accurate work and preventing or detecting pilfering by conductors or collectors of fares on street-cars and other public vehicles and at gateways and other entrances, in which each passenger or each fare is "registered" in the act of ringing a bell, and each unit, or the aggregate at given periods, is also "recorded" within the apparatus, or provision is made for obtaining, by the aid of the same main-actuating device, a printed record, showing the number of passengers or fares so "rung for."

The present invention consists in certain novel combinations of parts, hereinafter claimed, producing new results, or better results than have heretofore been secured, or old results in a new and better way, the whole constituting a newly-designed compact "passenger register and recorder" for use as a fixture in street-cars, and in like places, to be actuated in any approved way for ringing its bell, registering the successive units, and setting the recording mechanism, and to preserve within itself a record in plain figures, for a day or longer period, obtained on the part of the conductor or other agent, by simply inserting, turning, and withdrawing a "key," and disclosed by the proper officer by unlocking and opening the machine and withdrawing the record-drum, from which the paper bearing the record may then be quickly removed and fresh paper applied.

The objects of the several parts of this invention are as follows: first, to obtain a record in plain figures, periodically, by means of a key, in the manner above set forth; second, to obtain a continuous record, in plain figures, for a day or longer period, showing at once the number of trips, for example, and the total number registered during each trip; third, to obtain a printed record of the description last named; fourth, to provide for rotating the type-wheels of the recording mechanism, step by step, in the registering operation, and for lowering and re-elevating them in the recording and resetting operation, without disturbing them as regards their rotation; fifth, to provide for obtaining a record, in plain figures, periodically, by means of a key, as above stated, and at the same time for registering the units successively by means of a continuous registering mechanism of high capacity, showing the total up to 9,999, for example; sixth, to provide for obtaining a record, in plain figures, periodically, by means of a key, as above stated, and at the same time for ringing the bell for each unit as it is registered; seventh, to support the bell mechanism upon a door constituting the front of the machine, so as to economize space; eighth, to preclude false strokes of the bell in a peculiar way; ninth, to employ a long spiral spring as the striking-spring of the peculiarly-actuated bell mechanism for economy of wear and tear; tenth, to provide for simultaneously rotating the type-wheels of the recording mechanism and actuating the registering mechanism aforesaid, and subsequently ringing the peculiarly-located bell at each reciprocation of the main actuator.

In the drawings which accompany this specification, Figure 1 is a small perspective view of our passenger register and recorder, with its keys. Fig. 2 is a perspective view of its record-drum on a larger scale, showing an illustrative record as taken from the machine, together with the clip which secures said record-drum within the machine. Fig. 3 is a front view of the opened machine, partly in section, with a half face view of the "escutcheon" of the "box" of the "recording-key" appended. Fig. 4 represents a longitudinal section of the closed machine in the broken plane indicated by the line 4 4, Fig. 3. Fig. 5 represents a horizontal section of the closed machine in the plane indicated by the line 5 5, Fig. 3, omitting all below the plane of section, except the bell mechanism and door-fastening. Fig. 6 is a back view of the door, illustrating the operation of the bell mechanism; and Fig. 7 is a diagrammatic back view of parts behind the slide of the bell mechanism, illustrating the operation of the latter more fully.

Like letters of reference indicate corresponding parts in the several figures.

The shell of this machine is a cast-iron "case,"

C, with a door, D, forming its front. It is rectangular, excepting, by preference, a rounded top, presenting the appearance represented by Fig. 1, and is attached to the end wall of a street-car, or a like support, by means of screws or bolts passing through holes *z* in the back of the case, so that the screw heads or nuts are concealed and protected, together with the machinery, by the door D. This door has been attached to its left-hand edge by hinges *y*, so as to open horizontally. It may be secured by a fastening of any approved description.

The use of a self-locking "sealed catch" is illustrated in Figs. 1, 3, 5, and 6. The principal parts of this are a yielding catch, *x*, attached to the right-hand wall of the case C, inside, at an otherwise unoccupied point, and a rigid catch, *w*, with a seal-holder, *v*, as its support, attached to the back of the door D at a corresponding point, a round key-hole, *u*, being formed in said seal-holder and the door to admit a wire push-key, *k*, Fig. 1, between the points of the catches to force back the head of the yielding catch *x* when the door is to be opened. The "seal," which may be a scrap of paper bearing any distinguishing-mark, within the seal-holder is mutilated by inserting the key, or any substitute therefor. A knob, k^2, provides for pulling open the released door.

A transverse horizontal slide, S, working in holes cut in the sides of the case, constitutes the "main actuator" of the machine. Its protruding ends *t s* provide respectively for moving it in one and the same direction, which is indicated by arrows 1, by pulls and by thrusts, as may be most convenient. A strong spiral spring, *s'*, within the case retracts the slide, as indicated by arrows 2, and a notch, *r*, an incline, *q*, and a rigid arm, *p*, provide respectively for transmitting motion therefrom to the recording mechanism, the registering mechanism, and the bell mechanism, which will now be described in the order in which they are here named.

A record-drum, R, (shown detached in Fig. 2,) is constructed of cast-iron, with a cylindrical periphery having a permanent elastic covering, *o*, of sheet-rubber, for example, and around this a strip of paper, P, is stretched to receive the record. The ends of the paper may be simply united, by paste or mucilage, to each other and to the drum-covering, or a suitable clip may preferably be used. The drum R is mounted within the lower part of the case C, upon a stud-shaft, Q, which projects horizontally from a boss on the back of the case, and is grooved at its outer end to receive a spring-clip, *c*, Fig. 2, by which the record-drum is held in place upon said stud-shaft while at work, as shown in Fig. 4 and in dotted lines in Fig. 3.

A set of type-wheels, T, to coact with said record-drum, may consist of one or more "wheels" or disks carrying peripheral type, with any approved "setting" or advancing devices. A set of three, of a make in common use in paging-machines and the like, is represented, and will be referred to as a whole, without describing in detail its construction and mode of operation, as these are well known. The shaft of the type-wheels T is mounted longitudinally in a swinging frame, F, between the record-drum R and the slide S. Said frame F is supported at its right-hand end by a horizontal pivotal stud-pin, *n*, projecting from the back of the case, and comprises a pair of longitudinal side bars united at its left-hand end by a cross-bar, *m*. By this latter it is connected with a vertical slide, S^2, having a matching socket at its upper end, and guided by a pair of stud-screws, *l*, embraced by slots in the slide, as clearly shown in Fig. 3. The lower end of this slide S^2 rests upon a crown-cam on the circular head of a rotary "key-box," B, being rounded and otherwise properly shaped to coact with the said crown-cam. The key-box B and a hollow escutcheon, E, attached externally to the bottom of the case C by screws to inclose the outer end of said key-box, are best shown in Fig. 3 and the appended half face view of the latter. The key-box has a cylindrical body, to which the escutcheon, above its bottom, is fitted, the bottom of the escutcheon having a key-hole of the ordinary shape for a bitted key, while the body of the key-box has a recess adapted to receive the barrel and bit of such key longitudinally. A recording-key, K, Fig. 1, is fitted to said key-hole and recess, and when inserted and turned rotates the key-box B, as indicated by arrow 3, Fig. 3, for example, the bit of the key riding upon the bottom of the escutcheon E, which coacts therewith to preclude the withdrawal of the key until its position is that in which it was inserted, so that the key-box must be left as it was found by the key. A quarter-turn of said key-box B by the key K lowers said slide S^2, and therewith the frame F and type-wheels T, as shown in dotted lines in Fig. 3 and illustrated by arrows 3^a. A complete turn re-elevates the same, as illustrated by arrows 3^b. The lowering of the type-wheels T causes them to coact with the record-drum R, as aforesaid, for recording their indication at the time upon the paper P. To insure their descent promptly and with ample force, a strong spiral spring, s^2, is stretched between a stud on the slide S^2 and another on the contiguous wall of the case, as shown.

To provide for automatically rotating the drum R to render the record "continuous," an advancing pawl A, is pivoted to the inner side bar of the frame F, and supported by a spiral spring, s^3, and a stop-pin engaging with said frame, in working position, as shown in Fig. 3. A ratchet-wheel, W, is combined with said record-drum, preferably integral therewith, to coact with said advancing pawl, and a detent-pawl, X, is attached by a pivotal rivet to the back of the case and supported by a spiral spring, s^4, and a stop-pin, in normal position, as shown in Fig. 3. In said act of lowering the type-wheels the pawl A is lowered, as shown in dotted lines in Fig. 3, and by the aid of its spring s^3 is caused to engage with a fresh tooth of the ratchet-wheel W, which is locked mean-

while against retrogression by the pawl X, and in the succeeding re-elevation of the type-wheels (indicated by arrow 3^b) said ratchet-wheel and the drum R are turned the distance between two teeth of the former, as indicated by the arrow 3^c, and the paper P, carried by said drum, is correspondingly advanced relatively to the coacting line of type, in readiness for a succeding impression. Two impressions so obtained are shown in Fig. 2. The intention is that the conductor shall make such an impression or record by inserting, turning, and withdrawing the key K at the end of each "trip." The number of impressions will show whether this operation was duly performed, and a comparison of them will show the number of passengers rung for each trip, while a simple subtraction of the first from the last will give the aggregate for the day. To obtain this information, the door D is unfastened and opened and the drum R removed from the machine, as aforesaid. To facilitate its removal and replacement, it is constructed with a recessed face inclosing a sleeve-hub, H, which is readily grasped between the thumb and fingers of either hand in handling the record-drum, and the heads of the pawls A and X are beveled, and they are so supported, as aforesaid, as to cause them to readily enter the proper interdental spaces of the ratchet-wheel W, without any direct manipulation thereof.

To provide for printing the record upon the paper P, an ink-ribbon, I, is stretched horizontally between the type-wheels and record-drum, being attached at its ends to spools J J, and supported at the proper level by rods *j j*, projecting from the back of the case, said spools being mounted upon stud-spindles *i*, and tightened and released at will by jam-nuts *h* on the screw-threaded outer ends of these spindles in an ordinary way.

For transmitting motion from the main slide S to the type-wheels T for rotating the latter step by step to "set" them or cause them to show at all times a number corresponding with the reciprocation of said main slide to the extent of their capacity, a lever-link, *g*, is pivoted to a stud, *f*, on the back of the case, so as to project downward within the said notch *r* of said slide, and is connected by a horizontal link, *e*, to a pawl-carrier, *d*, which is pivoted on the type-wheel shaft, while a retracting-spring, s^5, is stretched therefrom to a stud on the near side bar of the frame F, as clearly shown in Fig. 3. In the example said pawl-carrier *d* carries three pawls coacting with the several ratchet-wheels of the set of type-wheels. Its details would of course vary with those of different patterns of type-wheel sets. The said combination of links, with the arrangement of these parts, as best shown in Fig. 3, insures the rotation of the type-wheels (indicated by arrows 1^a) when they are in elevated position, as shown in full lines in this figure, and facilitates precluding their disturbance as to rotation in the said acts of lowering and re-elevating them, (indicated by arrows 3^a 3^b,) as aforesaid.

The registering mechanism, like the set of type-wheels, may be of any approved description. It must possess compactness and strength of parts, with certainty of operation, and a high registering capacity, preferably not less than 9,999. We have shown such a mechanism, R^2, bought in open market, and which need not therefore be described, its details forming no part of this invention. Motion is transmitted to its main ratchet-wheel from the incline *q* on the main slide S, as best shown in Fig. 4 and indicated by arrow 1^b, by a lever, *b*, and a pivoted pawl-carrier, d^2, to which said lever is coupled by a pin and slot, said lever being constructed and arranged to coact with said incline properly. A retracting-spring, s^6, projects the lever *b* and restores the pawl-carrier d^2 to normal position, being stretched between the former and a stud on the register-frame. An aperture, *a*, in the door D, guarded by glass in customary manner, preferably exposes the register-wheels to view at their reading-line, as shown in Fig. 1; but this aperture may be omitted and notice of the operation be given to the passengers simply by the bell mechanism, which completes the machine, and shall now be described, with references more particularly to Figs. 5 to 7, in connection with Fig. 4.

The arm *p* on the main slide S coacts with a notch, *n'*, in a third slide, S^3, Figs. 4 to 6, which is guided by notched posts p^4 on the back of the door D, so as to work horizontally in unison with said slide S, but in a plane parallel to the back of the door. The slides engage with each other in the position of rest, to which the retracting-spring *s'* restores both after each registering movement, and the door D may consequently be opened and closed without disturbing either or interfering with their proper coaction when the door is closed. The slide S^3 is shown in said position of rest in Figs. 4 and 5 and in full lines in Fig. 6. Attached to the back of said slide S^3 by a pivotal rivet, *pr*, is a main bell-hammer, H', having a cast hub to receive said rivet and carry a tripping-stud, *ts*, which projects toward the door, as also to hold a strong hook or staple, from which a long spiral spring, s^7, is stretched to a stud on the back of the door at bottom, as the striking-spring of the bell mechanism, while said hub also comprises a strong heel to abut against a stop-pin, *sp*, on the slide. A gong-bell, G, is supported by a central screw within the hollow back of a concavo convex perforated portion of the door formed to receive it, and an intermediate or secondary bell-hammer, H^2, is attached to the back of the door by a pivotal rivet, r^2, and retracted by a spiral spring, s^8, so that its head is kept normally out of contact with the bell, and its heel against a stop-pin, p^2, on the door.

Behind the slide S^3 and bell-hammer H', as

best shown in full and dotted lines in Fig. 7, a trigger, T′, is attached to the door D by a pivotal rivet, r^3, and provided with a tail-spring, s^9, engaging with one of the posts p^4, and a stop-pin, p^3, on the door supports it normally, as it is shown in full lines. Said trigger carries a tripping-incline, *ti*, in the path of the tripping-stud *ts* of the main hammer H′. In the stroke of the slide S^3, corresponding with the registering-stroke of the main slide S, (indicated by arrows 1,) said stud *ts* passes under said incline *ti*, lifting the trigger T′ against the slight resistance of its spring s^9, as represented by arrow 1^c, Fig. 7, and releasing it again, so that said trigger is restored to normal position at the end of said stroke. At the beginning of the return-stroke of the slides S S^3 (indicated by arrows 2) the hammer H′ is in normal position relatively to the slide S^3, as seen by comparing full and dotted lines in Fig. 6. It is shown as it appears at this point of the operation by the right-hand outline thereof in Fig. 7. During said return-stroke, the coaction of said incline and stud causes the hammer H′ to rise, as indicated by arrow 2^a. Toward the end of this stroke it occupies the "elevated" position, (represented by the left-hand outline thereof in Fig. 7,) and a moment later the stud *ts* passes beyond the incline *ti*, and the striking-spring s^7 brings the released hammer forcibly down upon the head of the hammer H^2 and causes the latter to give the bell a highly-effective stroke, (indicated by arrow 4,) while the organization of the mechanism is such that it is impossible to throw said hammer H^2 into contact with the bell, save in the manner thus recited, and it is impossible to effect this action, save during the "return-stroke" of the main slide after a fully-completed "registering-stroke," during which it will have rotated the type-wheels T and actuated the continuous register R^2, as aforesaid. Thus as each passenger is rung for by means of the bell mechanism of the machine he is registered as a unit by the said registering mechanism, and the said recording mechanism is correspondingly set or adjusted by one and the same reciprocation of the main actuator; and at the end of each trip, or at will, by inserting and turning the key K, a correct record in plain figures, for which the type-wheels T have been so set is printed upon the paper P, the latter is advanced preparatory to the next printing operation, and the recording mechanism is left in condition to be set by the main actuator, as before. At the ends of longer periods, or at will, by means of the key *k* and knob k^2, or the employed opening device, the door D may be unfastened and thrown back and the clip *c* and record-drum R successively removed, the paper P renewed, if desired, and the operation begun anew with or without resetting the type-wheels T to zero. Preferably, to combine simplicity with security, they are not adapted to be so reset, but, together with the wheels of the continuous register, turn forward continuously, indicating 0 and then 1 again, and so on when the limit of their capacity has been reached. In reading a record so formed, if the indication at the end of one trip be 950 and that at the end of the next 009, the latter is seen to be equivalent to 1009, while for the next subtraction it is read as 9, and so on.

Besides the modifications herein indicated, many other immaterial changes will suggest themselves to those skilled in the manufacture and use of registers and recorders, individual combinations hereinafter claimed will be seen to be capable of embodiment without others, and the machine, with or without such alterations, may be used for keeping tallies of games or of receipts and deliveries of goods or the like, the same as other machines of its class. All such modifications, omissions, and applications of the machine, and its respective features hereinafter claimed, are intended to be included within the scope of our invention. We do not, however, claim broadly a type-wheel recording mechanism, nor a removable drum to bear the record, nor the combination, with a recording mechanism, of a continuous register and a bell mechanism, either or both, broadly considered, all of which are believed to be so old and well known as be public property.

We claim as new and desire to patent under this specification—

1. The recording-key K, rotary key-box B, and escutcheon E, in combination with a pivoted frame, F, and connecting devices, substantially as described, for lowering and re-elevating a set of type-wheels, T, for the purpose set forth.

2. The record-drum R, adapted to carry the paper P upon its periphery, in combination with type-wheels T, adapted to be lowered to coact with said record-drum, and re-elevated to a position in which they are rotated, substantially as herein described, and means for rotating said drum, step by step, by impulses transmitted from the frame of said type-wheels during their successive re-elevations, for the purpose set forth.

3. The horizontally-stretched ink-ribbon I, in combination with a set of type-wheels, T, arranged above the same, and adapted to be lowered and re-elevated, as described, a record-drum, R, carrying the paper P upon its periphery below said ink-ribbon, and means for rotating said drum, step by step, by impulses transmitted from the frame of said type-wheels during their successive re-elevations, for the purpose set forth.

4. The combination, substantially as specified, of the actuating-slide S, having the notch *r*, the lever-link *g* pivoted to a stud, *f*, above said slide, and extending through said notch, the horizontal link *e* below the slide, and the pivoted pawl-carrier *d*, as means for rotating, step by step, a set of type-wheels, T. adapted to be independently lowered and re-elevated at will, for the purpose set forth.

5. The combination, substantially as herein

specified, of type-wheels mounted in a movable frame, a continuous register of high capacity, a main actuator common to both, for registering units and simultaneously rotating said type-wheels, step by step, to set them, and means for periodically taking impressions from said type-wheels, comprising a recording-key and appurtenances thereof, for lowering and re-elevating said type-wheels, for the purpose set forth.

6. The combination, substantially as herein specified, of type-wheels mounted in a movable frame, a bell mechanism, a main actuator common to both, for ringing the bell for each passenger or fare, and rotating said type-wheels, step by step, to indicate the number so rung for, and means for periodically taking impressions from said type-wheels, comprising a recording-key and appurtenances thereof, for lowering and re-elevating said type-wheels, for the purpose set forth.

7. The combination, with the case C, of the door D, forming the front of said case, and having upon its back a bell mechanism, movable therewith, and adapted to coact with a main actuator within said case, substantially as described, for the purpose set forth.

8. The combination, with the main slide S and its retracting-spring, of the slide S^3, moving in unison with the former, a main bell-hammer, H′, carried by said slide S^3, a secondary hammer, H^2, struck by the former, a bell, G, struck only through the medium of said hammer H^2, and means for actuating said hammer H′ during each reciprocation of said slides, substantially as described, for the purpose set forth.

9. In combination with the bell-hammer H′, carried by the slide S^3, and attached therewith to the back of the door D, a long spiral spring stretched from the heel of said hammer, substantially at right angles to said slide, to a distant stud on the back of the door, as a striking-spring, substantially as shown, for the purpose set forth.

10. The combination, substantially as herein specified, of a set of type-wheels and a continuous register within the case C, a bell mechanism attached to the back of the door D, and a main slide and its retracting-spring for rotating said type-wheels and actuating said register simultaneously, or nearly so, during each main stroke of said slide, and for causing said bell mechanism to strike the bell during each return-stroke of said slide, for the purpose set forth.

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