2 Sheets—Sheet 1.

W. H. PICKFORD.
Ticket-Punch.

No. 207,981. Patented Sept. 10, 1878.

Fig. 1.

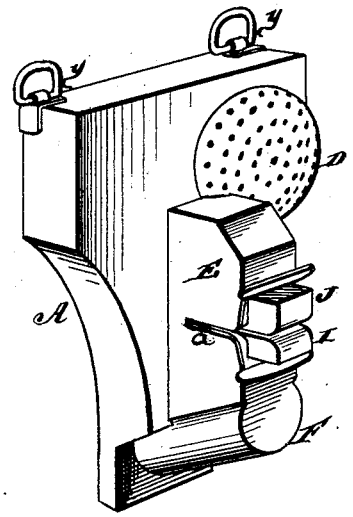


Fig. 2.

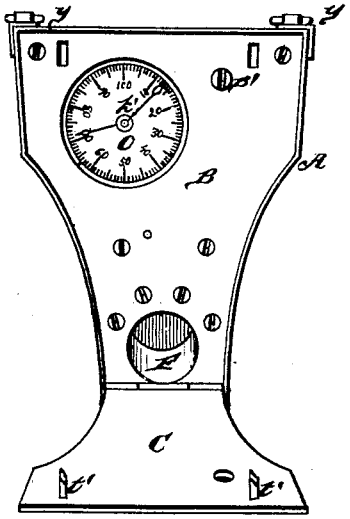
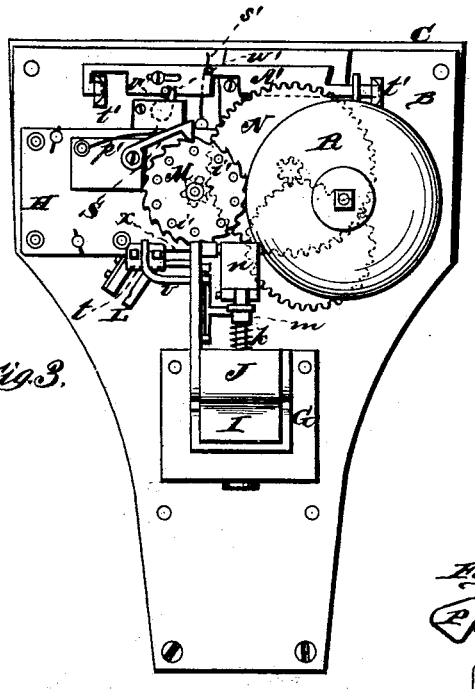


Fig. 3.



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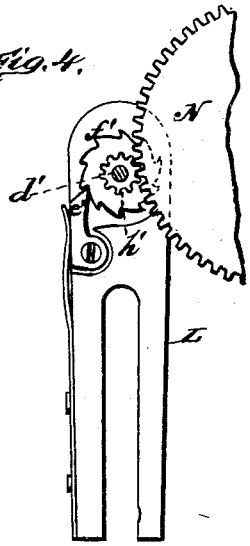
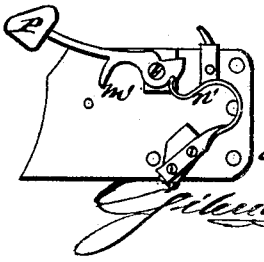


Fig. 5.



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Ticket-Punch.

No. 207,981. Patented Sept. 10, 1878.

Fig. 6.

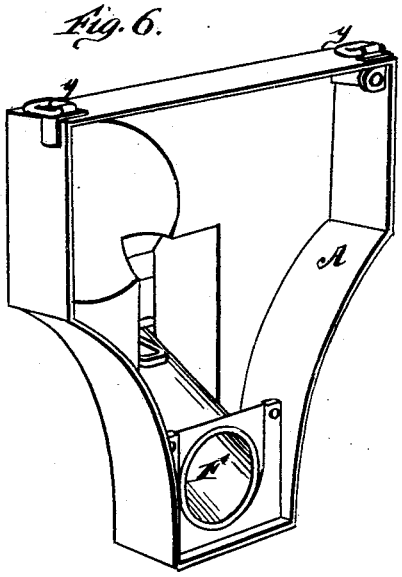


Fig. 7.

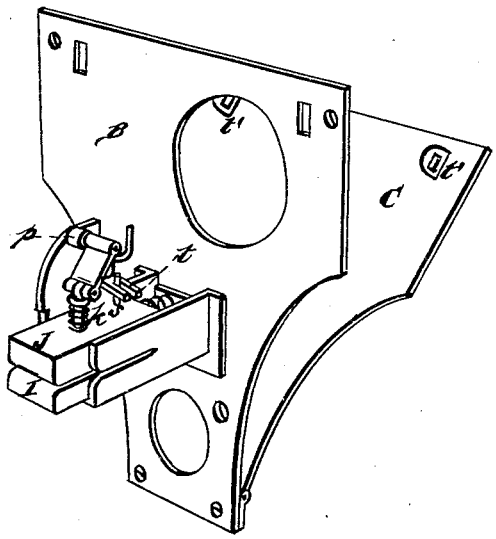


Fig. 8.

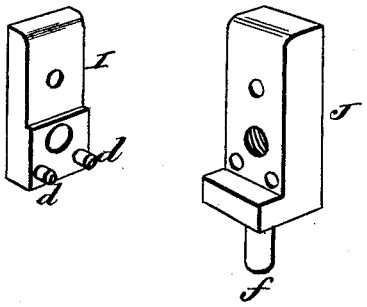
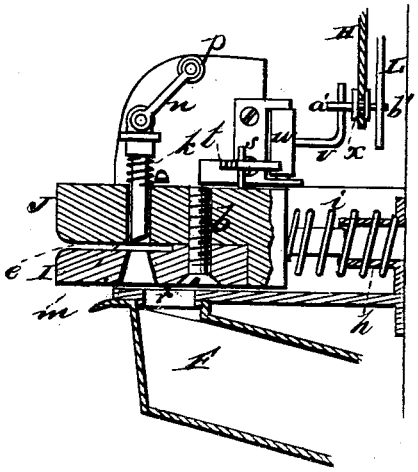


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM H. PICKFORD, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN TICKET-PUNCHES.

Specification forming part of Letters Patent No. **207,981**, dated September 10, 1878; application filed May 25, 1878.

To all whom it may concern:

Be it known that I, WM. H. PICKFORD, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and valuable Improvement in Ticket-Punches; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a perspective view of my ticket-punch. Fig. 2 is a rear view, showing it open. Fig. 3 is a view showing working mechanism. Figs. 4 and 5 are detail views. Figs. 6, 7, and 8 are perspective details, and Fig. 9 is a sectional detail thereof.

The nature of my invention consists in the construction and arrangement of a ticket-punch, as will be hereinafter more fully set forth.

The annexed drawings, to which reference is made, fully illustrate my invention.

A represents the case of my ticket-punch, provided with an interior back plate, B, and an exterior back plate C. The inner plate, B, has all the operating mechanism attached to it, and is fastened permanently in the back of the case by screws. The outer plate, C, is hinged to the lower end of the plate B, and is fastened by a lock, hereinafter described.

The front of the case A is provided with a perforated bell-case, D, also with a projection, E, and below this latter is a closed chamber, F. The sides of the projection E are slotted, as shown at *a*.

To the inner side of the inner back plate, B, are attached two frames, G and H, of suitable construction, the former containing the punch mechanism and the latter the register and alarm mechanisms.

In the frame G is placed a slide, J, provided with a side piece, I, which latter is held to the slide by a screw, *b*, and dowel-pins *d d*. These parts are so arranged as to leave a narrow slit, *e*, between them, corresponding with the slots *a* in the projection E of the case. The slit *e* should be of proper width just to admit the thickness of the ticket to be punched. When the ticket-punch is to be used on roads having thicker or thinner tickets, the slit *e* is easily regulated by simply substituting a piece, I, of the corresponding size.

The slide J has at its lower end a stem or tenon, *f*, which enters a guide-socket, *h*, secured on the back plate B, and a spiral spring, *i*, is arranged around said parts in such a manner as to throw the slide outward or forward.

m represents the punch, passed from the top through the slide J and into the piece I. The upper end of the punch is hinged to an arm, *n*, and this arm is pivoted on a stud, *p*, projecting from the frame G, thus forming a knuckle-joint for the punch. The upper portion of the punch *m* is surrounded by a spiral spring, *k*, to assist in withdrawing the punch.

The ticket being inserted in the slide J, and said slide pushed inward at the same time by the ticket, the punch is forced downward by the knuckle-joint, perforating the ticket, the piece taken out of the ticket dropping through an aperture, *r*, in the frame G into the closed chamber F underneath, said chamber having a corresponding opening made for that purpose in its upper side. As soon as the pressure on the ticket is relieved the spring *i* throws the slide J forward again, and the punch *m* is, by the action of knuckle-joint and spring, drawn upward to allow the ticket to be withdrawn.

On the upper part of the slide J is a projecting pin, *s*, which works in a slotted arm, *t*, projecting from a rocking-shaft, *w*, hung in suitable bearings on the frame G. From the rocking-shaft *w* projects a bent arm, *v*, by which the registering and alarm mechanisms are operated in the following manner.

The arm *v* projects into a forked slide, *a'*, which moves in a slot, *x*, in the frame H. This slide has a projecting pin, *b'*, which enters a slotted lever, L, hung upon a shaft, *d'*. This shaft is provided with a ratchet-wheel, *f'*, and a spring-pawl, *e'*, on the lever L takes into the same, so that by the movement of the slide *a'* in one direction the shaft *d'* will be rotated, while when it moves in the other direction the pawl *e'* will simply slide over the ratchet-wheel *f'*.

The shaft *d'* is further provided with a pinion, *h'*, and a large ratchet-wheel, M.

The pinion *h'* meshes with and operates the

train of gearing N for a registering mechanism, the dial O of which is seen through an opening in the inner back plate, B, and is provided with the index-hands *k'*. To the construction of this registering mechanism I lay no claim, as that may be constructed and arranged in any suitable manner to answer the purpose for which it is intended.

The large ratchet-wheel M is on one side provided with a series of pins, *i'*, set or projecting from one side of the wheel in a circle at equal distances apart. These pins in rotation operate against an arm, *m'*, on the bell-hammer P, and as soon as the pin clears said arm a spring, *n'*, throws the hammer against the bell R and sounds the alarm.

It would sometimes happen, or I can say it might be made to happen every time, that the alarm would be sounded and yet no register made and no hole punched in the ticket, by simply failing to push in the slide J the full length of its stroke; or, in other words, pushing in the slide sufficiently far to raise the hammer and then letting the slide go, when the bell would sound, but no hole would be made in the ticket, nor would the register be operated. To obviate this difficulty, I provide the ratchet-teeth on the edge of the wheel M and a pivoted pawl, S, to take into the same, a spring, *p'*, holding the pawl in the wheel. These parts are so arranged that, just before the pin *i'* clears the arm *m'* of the bell-hammer, the pawl S drops down behind one of the teeth on the wheel M, and hence, even should the slide J not be pushed all the way in, the alarm will not sound, as the wheel M cannot turn back, but remains stationary and holds the bell-hammer elevated. As soon, however, as the slide J is pushed all the way in, the punch operates, the alarm sounds, and the register is actuated, all simultaneously.

The pieces from the tickets are retained in the chamber F, and should correspond with the number shown on the register.

The lock for fastening the outside back plate, C, consists of an elongated bolt, A', arranged on the inside of the plate B, and its ends thrown by a spring, *s'*, into perforated ears *t' t'*, which project from the plate C through slots in the plate B.

B' is the lock-tumbler, which operates an arm, *v'*, and this acts against a pin, *w'*, on the bolt A'. The end of the tumbler B' projects through a hole in the plate C.

The top of the case A is provided with rings *y y*, for attachment to a belt or strap for carrying the ticket-punch.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a ticket-punch, the slide formed of the part J, having the pintle *f* and the removable piece I *d*, the two parts adapted to be secured together with screw *b*, so as to leave the slot *e* with an abutting shoulder, in combination with the spring *i*, as specified.

2. The slide composed of the parts J I, having the pintle *f*, combined with the guide-socket *h*, the actuating-spring *i*, the said slide adapted to be held out of connection with the aperture *r* in the chamber unless forced back by the ticket, as shown and specified.

3. The combination of the slide J I, formed in two parts, with pin *s* on part J, and the rocking-shaft *w*, with slotted arm *t* and bent arm *v*, for operating the alarm and register directly from the slide, as shown and described.

4. In combination with the arm *v*, operated from the slide J, the slide *a'*, with pin *b'*, the lever L, with spring-pawl *e'*, and the shaft *d'*, with ratchet-wheel *f'*, pinion *h'*, and wheel M, as herein specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

W. H. PICKFORD.

Witnesses:
WILLIAM GAMBLE,
DAVID HOWELL.