J. H. DAVIS.

CONDUCTORS' PUNCHES.

No. 184,463. Patented Nov. 21, 1876.

FIG. 1.

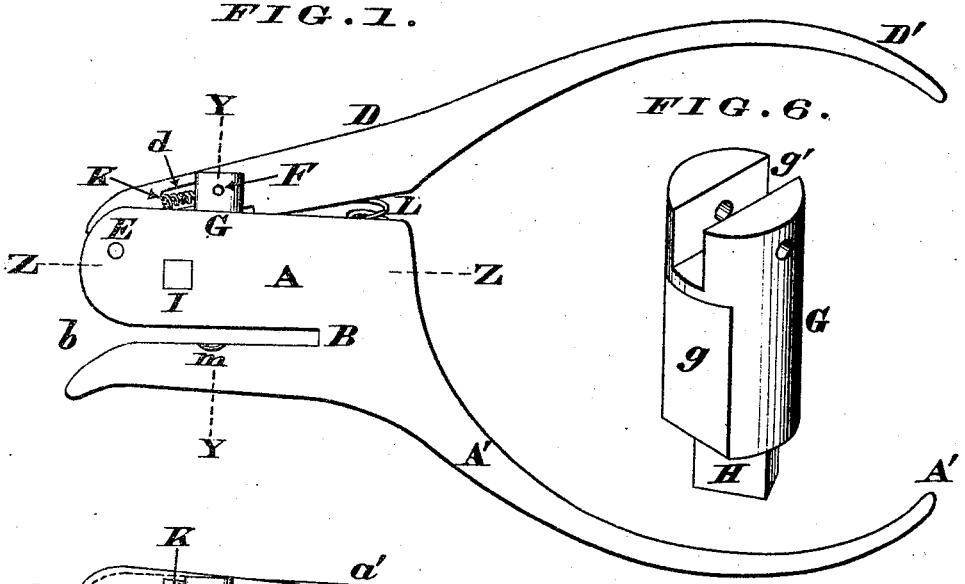


FIG. 6.

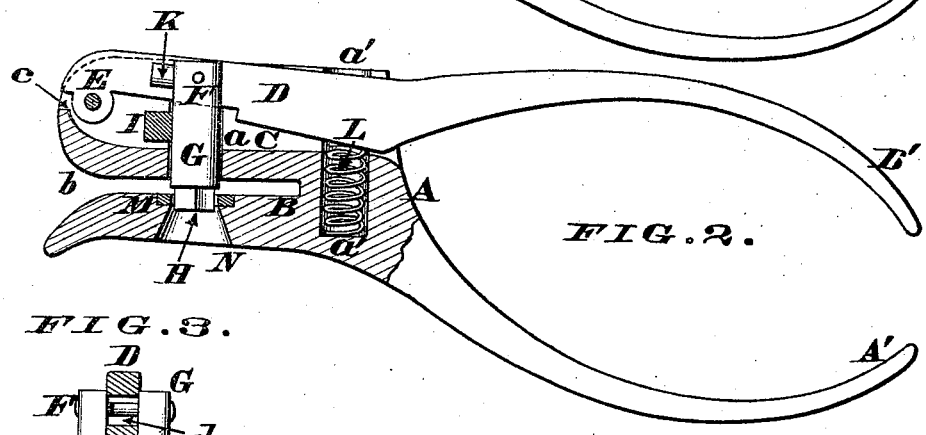


FIG. 2.

FIG. 3.

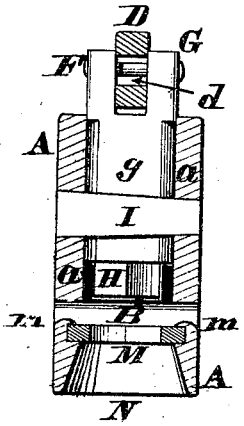


FIG. 4.

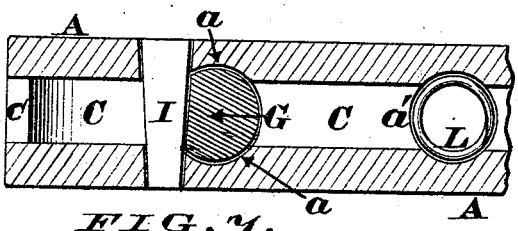


FIG. 5.

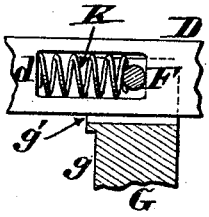
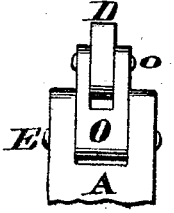


FIG. 7.



Attest.
L. Bond
Chas. Thomas.

John H. Davis.
by James H. Layman
his Attorney.

UNITED STATES PATENT OFFICE.

JOHN H. DAVIS, OF COVINGTON, KENTUCKY, ASSIGNOR OF ONE-HALF HIS RIGHT TO FREDERICK J. MEYERS, OF SAME PLACE.

IMPROVEMENT IN CONDUCTORS' PUNCHES.

Specification forming part of Letters Patent No. **184,463**, dated November 21, 1876; application filed September 27, 1876.

To all whom it may concern:

Be it known that I, JOHN H. DAVIS, of Covington, Kenton county, Kentucky, have invented certain new and useful Improvements in Conductors' Punches, of which the following is a specification:

This invention relates to that class of punches employed by railroad-conductors and others for perforating tickets, passes, checks, &c.; and the first part of my improvements consists in providing the head of the implement with a tapering key, disposed transversely of the plunger. This key bears against a flat face of said plunger, and thereby assists in confining the latter to a vertical path in the head of the device. Furthermore, said key is capable of being "set up" to compensate for any wear either of the key or plunger.

The second part of my invention consists in slotting one of the jaws of the implement, and applying transversely of said slot a pin, to which the plunger is attached. A spiral or other suitable spring or elastic cushion is fitted in said slotted jaw or handle, so as to bear against the pin; and when the punch is operated said spring yields, and thereby prevents any binding of the plunger within the head of the implement.

Figure 1 is a side elevation, showing my improved punch in its normal position. Fig. 2 is a longitudinal section of the same closed. Figs. 3 and 4 are enlarged sectional views, taken, respectively, at the lines Y Y and Z Z. Fig. 5 is a vertical section through the upper end of the plunger and its accessories. Fig. 6 is a perspective view of the plunger detached from the implement, and Fig. 7 represents a modification of the invention.

A represents the head of the implement, from which projects the customary curved handle A′, of any convenient shape and size. This head is provided with the customary horizontal slot B, that receives the ticket or slip to be punched. A flaring mouth, *b*, facilitates the insertion of tickets, passes, &c., into said slot. Head A is provided with a vertical mortise or groove, C, which is not carried down as far as slot B; and said groove has fitted within it a vibrating lever, D, whose rear end or handle D′ is bent into any convenient shape. The front end of lever D is retained in the groove C by means of a pivot, E, applied transversely of the head A. Furthermore, this lever is slotted at *d* to receive a pin, F, wherewith the plunger G is coupled to said lever. This plunger is composed of a round bar of steel or other hard metal, and carries at its lower end the punch or perforator, H, which punch may be made in one piece with said plunger; or it may be screwed into or otherwise attached to the same. The punch H may be shaped to cut apertures of any desired form; or it may be adapted to perforate the ticket with numerals, or with any selected combination of numerals. This plunger is cut away on its front side, thereby producing a flat vertical surface, *g*, against which one edge of the tapering key I bears, and thus prevents any rotation of said plunger within the chambered portion *a* of the head. Plunger G is gained, *g′*, at its upper end to admit the lever D.

Interposed between pin F and the front end of slot *d* is a spring or yielding cushion, K, which compresses readily when the handles A′ and D′ are caused to approach each other. These handles are maintained in their normal positions by a spring, L, that occupies a chamber, *a′*, in the head of the implement.

A shoulder or stop, *c*, at the front end of groove C, limits the opening of levers A′ D′. Fitted in the head A is a die, M, of any suitable hard metal, said die being maintained in line with plunger G by upsetting the metal around said die, as seen at *m* in Fig. 3. Located beneath die M is a downwardly-flaring aperture, N, through which the punchings drop.

When the implement is in its normal position, as shown in Fig. 1, the spring L distends the levers or handles A′ D′, the shoulder *c* limiting the opening of said levers. In this condition of the implement the plunger G is elevated far enough to raise the punch H above the top of slot B, and thereby afford an unobstructed passage for the insertion of the ticket or other article to be punched. The ticket is then inserted in the slot, and punched in the usual manner by causing the two handles A′ and D′ to approach each other, which

act drives the device H through die M, and thus perforates the ticket.

The plunger G being snugly fitted in chamber *a*, so as to be incapable of any but a vertical movement within the head or frame A, it is evident some provision must be made to compensate for what would otherwise be a curved path, described by pin F from pivot E as a center, as soon as handle D′ is depressed. This compensation is effected by the interposition of the yielding medium K, which allows unrestricted vibration of lever D D′, while at the same time the free vertical movement of plunger G is not interfered with. When handle D′ is liberated spring L distends the levers A′ and D′, and the plunger G is elevated vertically within the head A *a*.

While this elevation of said plunger is occurring, the tension of spring K is gradually relaxing, and by the time levers A′ D′ are fully distended, said spring has forced the pin F to the rear end of slot *d*, as seen in Fig. 5.

From the above description it will be apparent that the provision of devices *d* F K permits the levers A′ and D′ being opened and closed with the utmost facility, while at the same time the plunger G is confined to a vertical path within the head, and consequently the punch H can never be injured by contact with die M.

This peculiarity of construction renders my implement much more effective and durable than those devices in which the punch is applied directly to one end of a pivoted handle. This old method of construction causes the punch to move in the arc of a circle, and as soon as the pivot becomes worn the punch is liable to come in contact with the die, and be broken or bent. During the ascent and descent of plunger G the key I bears against the front flat surface *g* of said plunger, and thereby prevents any rotation of the latter within its socket *a*. This provision of the flat guide I insures the accurate passage of punch H through die M, and if, at any time, the plunger or key should become worn, the latter can then be driven in far enough to compensate for such wear. After the key has been readjusted it can be retained in its new position by simply upsetting the metal of frame A around the larger end or head of said key.

As the principal feature of my invention consists in confining the plunger G within the guide *a* by means of the devices *g* and I, the right is reserved of using other appliances than the ones *d* F K for imparting a direct vertical movement to said plunger. An obvious and simple substitute for these devices is the link O, (seen in Fig. 7,) the lower end of which link is secured to head A by rivet E. *o* is a pivot wherewith the upper end of said link is coupled to the lever D D′; or the pin F may traverse a slot of such shape as to allow the spring or cushion K being omitted. Furthermore, a conical screw may be substituted for the tapering or wedge guide I, and, in some cases, two or more of such screws or guides may be employed for a single plunger.

This elaboration of the invention will be especially applicable where considerable stroke is required for plunger G.

I claim as my invention—

1. In combination with the vertically-reciprocating plunger G H, having a flat face, *g*, the adjustable guide I, substantially as herein described and set forth.

2. The combination, in a conductor's punch, of the slotted and grooved head A A′ B C, pivoted and slotted lever D *d* D′ E, pin F, plunger G, and compensating device K, substantially as herein described and set forth.

3. An improved conductor's punch, consisting, essentially, of the slotted, grooved, and chambered head A *a a′* B C, pivoted lever D *d* D′ E, plunger F G *g* H, guide I, compensating device K, retracting-spring L, and die M, when arranged with reference to each other, substantially as herein described and set forth.

In testimony of which invention I hereunto set my hand.

JOHN H. DAVIS.

Witnesses:

JAMES H. LAYMAN,

FRED. J. MEYERS.