

F. H. W. HIGGINS.  
PERFORATING AND PUNCHING INSTRUMENT.  
APPLICATION FILED MAY 18, 1908.

923,792.

Patented June 1, 1909.

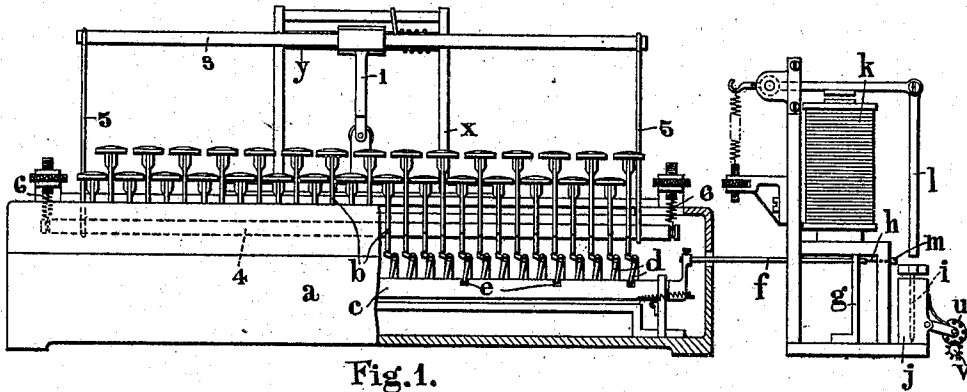


Fig. 1.

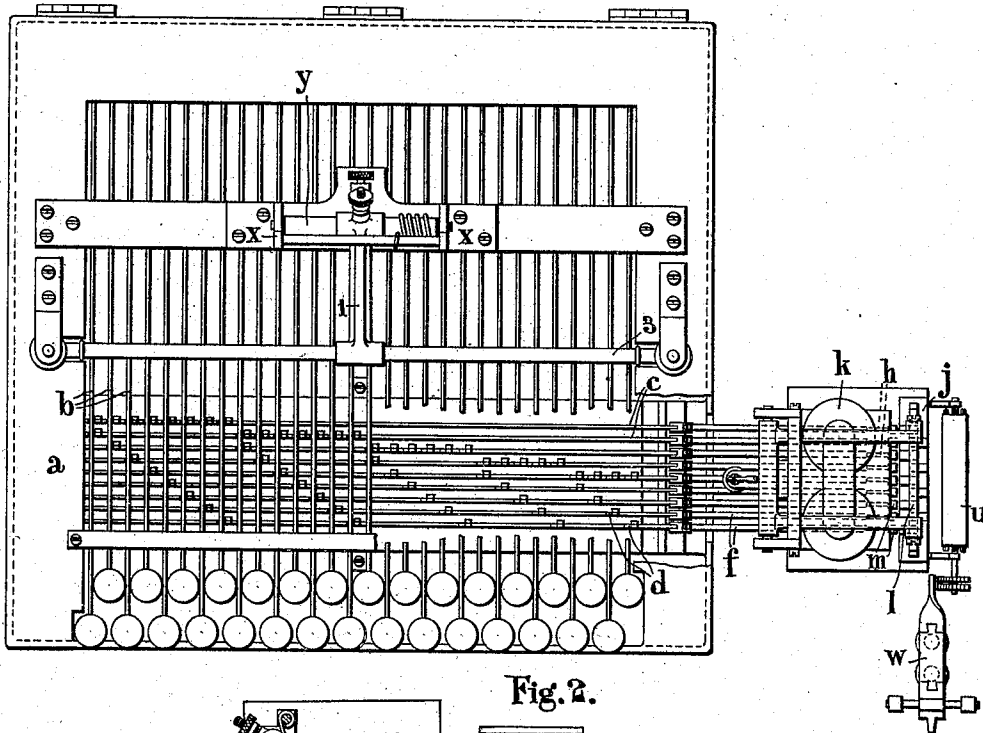


Fig. 2.

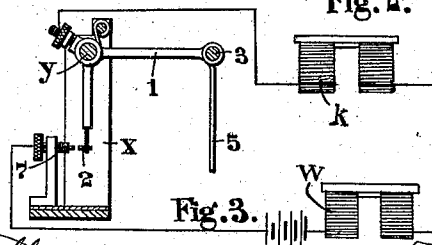


Fig. 3.

Attest.  
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# UNITED STATES PATENT OFFICE.

FREDERICK HERBERT WILLIAM HIGGINS, OF LONDON, ENGLAND.

## PERFORATING AND PUNCHING INSTRUMENT.

No. 923,792.

Specification of Letters Patent.

Patented June 1, 1909.

Original application filed December 12, 1905, Serial No. 291,472. Divided and this application filed May 18, 1908.  
Serial No. 433,465.

*To all whom it may concern:*

Be it known that I, FREDERICK HERBERT WILLIAM HIGGINS, a subject of the King of Great Britain and Ireland, and residing at 17 and 18 Cornhill, London, E. C., England, have invented certain new and useful Improvements in and Relating to Perforating and Punching Instruments, of which the following is a specification.

10 This invention relates to perforating and punching machines and has special reference to such machines as are used for perforating tape in conjunction with telegraph instruments.

15 This invention has for its object to provide a machine of improved and simple construction and in which the perforation of the tape is performed electrically.

20 My invention consists in the improved perforating and punching machine hereinafter described and illustrated.

Referring now to the accompanying drawings which illustrate this invention and form part of this specification, Figure 1 shows a part elevation of a machine constructed according to my invention; Fig. 2 shows a plan of same; Fig. 3 shows a detail of the contact for actuating the punching and feeding magnets.

30 I will now describe my invention as applied to the perforation of a tape, the code symbols on which are formed by selecting a certain number of positions out of a larger possible number on the breadth of the tape. Thus in the example of machine to be described the code symbols are formed by actuating two out of nine punches arranged transversely to the length of the tape so that if desired 36 different combinations of perforations may be obtained.

40 In carrying my invention into effect according to one form I provide a casing, *a*, Figs. 1 and 2, in which a number of key levers, *b*, are mounted; underneath the key levers, *b*, bars, *c*, nine in number are disposed which are adapted to be moved transversely on the manipulation of the key lever by the bell crank levers, *d*, one arm of which is in engagement with the key lever while the other engages with the notches, *e*, in the bars *c*. Each key lever engages with two of the bell crank levers, *d*, so that two of the bars, *c*, are always traversed toward the right, on the manipulation of each key lever. To one end of each of the bars, *c*, rods, *f*, slidably mount-

ed in the brackets, *g*, are attached having springs, *h*, inserted in their length so as to allow for the deflection thereof consequent on the operation of punching. The ends of two of these rods are adapted on the depression of the coöperating key lever to be slid on to the heads of the punches, *i*, disposed in the frame, *j*.

An electro-magnet, *k*, has a frame, *l*, suspended from its armature bar which frame, on the energization of the magnet descends on the ends, *m*, of the rods, *f*, and causes the tape to be perforated in positions corresponding to the position of the bars, *f*, which have been slid forward on to the top of the punch heads. The frame, *j*, has also punches for feed perforations arranged on each side of the signal punches so that feed holes are perforated on each reciprocation of the armature bar the tape being fed forward by feed rollers, *u* and *v*, which are actuated by an electro-magnet, *w*, on the completion of each punching operation. A standard, *x*, is arranged on the top of the casing, *a*, having a shaft, *y*, rotatably mounted thereon. On the shaft, *y*, a bell crank lever, *1*, is attached so as to rotate therewith and has a contact piece, *2*, attached to one of its arms, while the other carries a yoke-piece, *3*, which supports a bar, *4*, by means of hooks, *5*. Springs, *6*, cause the bar, *4*, to be yieldingly held against the key levers, *b*. One of the leads from the electromagnet, *k*, is connected to the lever arm carrying the contact piece, *2*, while the other is connected to the contact, *7*, through the electromagnet, *w*, a battery or other suitable source of power being included at any convenient point in the circuit. The depression of a key lever causes the two corresponding rods to be slid forward so that their ends rest on the top of the punch frame and when this operation has been completed the circuit through the contact, *2* and *7*, is closed and the energization of the magnets, *k* and *w*, is effected. The energization of the magnet, *k*, causes the feed and signal perforations to be punched while on breaking the circuit by releasing the key lever, the deenergization of the magnet, *w*, causes the feed rollers to be rotated the necessary distance for spacing the signals.

It will be evident that by means of my invention an exceedingly compact and efficient machine is produced while the exer-

tion of manipulation is reduced to the smallest possible amount owing to the employment of electromagnets for operating the punching and feeding mechanisms. It will also be evident that many modifications in the above machine will suggest themselves to those skilled in the art as the above example is intended to be typical only of my invention and not in any way limiting the scope of the same.

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

1. In combination, a plurality of key levers; a plurality of slidable bars transversely disposed to said key levers; a resilient member inserted in the length of said bars; a plurality of punches; mechanical means acting on the depression of a key lever for sliding certain of said bars on to the heads of certain of said punches; means for operating the punches on to the heads of which said certain bars have been slid together with means for operating certain other of said punches.

2. In combination, a plurality of key levers; a plurality of slidable bars transversely disposed to said key levers; a resilient member inserted in the length of said bars; a plurality of punches; mechanical means acting on the depression of a key lever for sliding

certain of said bars on to the heads of certain of said punches; electromagnetic means acting on the depression of said key lever for operating the punches on to the head of which said certain bars have been slid together with certain other of said punches; feed rolls together with electromagnetic means for operating said feed rolls.

3. In combination, a plurality of key levers; a plurality of slidable bars transversely disposed to said key levers; a resilient member inserted in the length of said bars; a plurality of punches; mechanical means acting on the depression of a key lever for sliding certain of said bars on to the heads of certain of said punches; electromagnetic means acting on the depression of said key lever for operating the punches on to the heads of which said certain bars have been slid together with certain other of said punches; feed rolls; electromagnetic means for operating said feed rolls, said first and second mentioned electromagnetic means being located in one electrical circuit.

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

FREDERICK HERBERT WILLIAM HIGGINS.

Witnesses:

A. M. CALLIS,  
G. MULLINS.