No. 818,194. PATENTED APR. 17, 1906.

E. L. RICHARDS.

PUNCH HOLDER FOR TABLET MACHINES.

APPLICATION FILED DEC. 6, 1905.

Fig. 1.

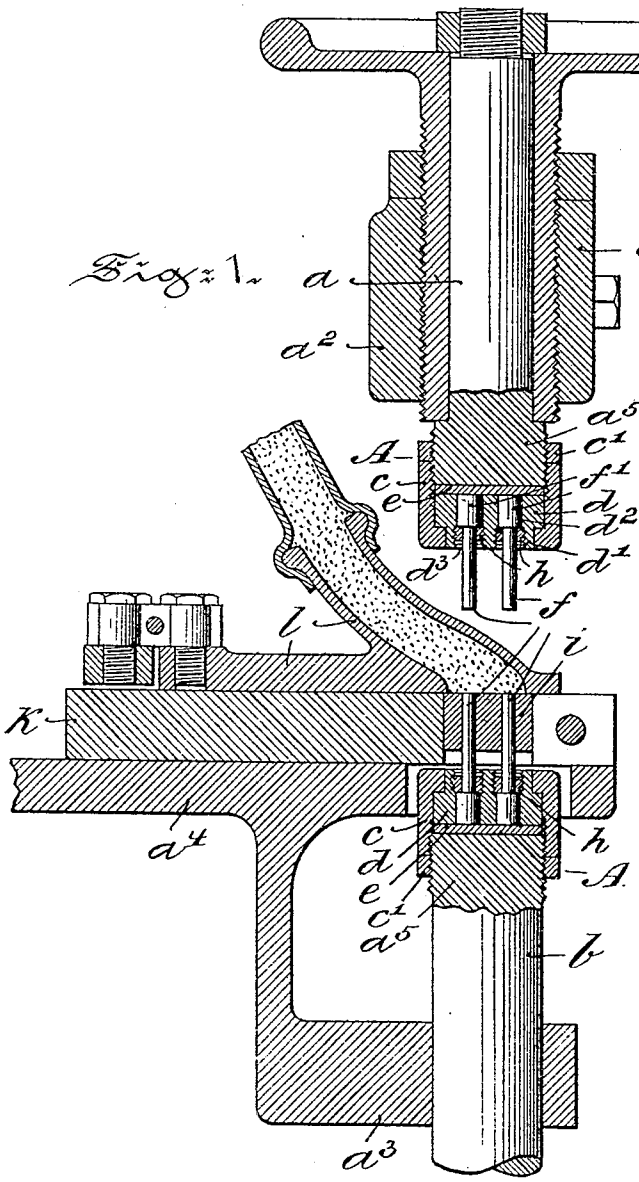


Fig. 2.

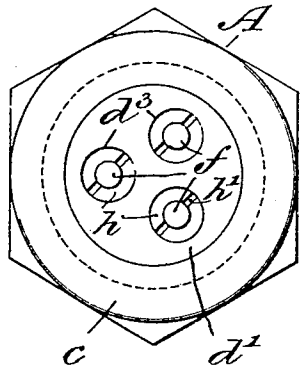
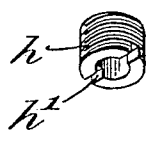


Fig. 3.



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Nichols #584,236 June 8, 1897 (164-24)
Pechin #668,016 Feb. 12, 1901 (107-18)

UNITED STATES PATENT OFFICE.

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PUNCH-HOLDER FOR TABLET-MACHINES.

No. 818,194. Specification of Letters Patent. Patented April 17, 1906.

Application filed December 6, 1905. Serial No. 290,511.

To all whom it may concern:

Be it known that I, EMANUEL L. RICHARDS, a citizen of the United States, residing at the city of New London, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Punch-Holders for Tablet-Machines, of which the following is a specification.

My invention has relation to a punch-holder for tablet-machines; and in such connection it relates particularly to means for directly connecting the punches with the plunger of such machines and to means for permitting of the removal and replacing of one or more of the punches without necessitating the disengagement of the connecting means for the same from the plunger.

Heretofore punches for tablet-machines were supported by a holder which was inserted in the end of the plunger, thus weakening the same at the point of greatest strain. Between the punches and the holder was interposed a plate with a rounded head bearing against the bolt or holder inserted in the plunger. In cases where a somewhat greater amount of material was to be compressed into tablets by one of the punches the same on account of the rounded head of the interposed plate and resistance offered by the material was permitted to yield, and thus to assume a somewhat oblique position with respect to the holder, which caused thereby the same to break at the point of contact with the holder, and removal or replacement of one of the punches necessitated disengagement of all of them from the holder.

The principal objects of my invention are, first, to overcome the disadvantage of the above-described character of punch-holders; second, to directly connect the supporting-plate for the punches with the plunger, and thus to prevent weakening of the same and breaking of the punches by a side thrust imparted to the punch in its holder, and, third, to removably connect the punches with their holder by holding the same in position in the supporting-plate by a nipple accessible and also removable from the exterior of the punch-holder.

The nature and scope of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a vertical sectional view of a portion of a tablet-machine, illustrating the upper and lower plungers and the punch-holders directly connected with the same embodying main features of my said invention. Fig. 2 is a top or plan view, enlarged, of the lower punches and their holders; and Fig. 3 is a perspective view, enlarged, illustrating a threaded nipple for removably locking the punches to a supporting-plate of the holder.

Referring to the drawings, a represents the upper plunger, adjustably connected by an externally-threaded sleeve a' to the cross-head a^2, and b is the lower plunger, guided in a projecting portion a^3 of a bed-plate a^4 of a tablet-machine—such, for instance, as has been shown and described in United States Letters Patent No. 686,765, granted to me under date of November 19, 1901. To the threaded end a^5 of each of the plungers a and b is removably secured an internally-threaded cap c, locked in position thereon, preferably by a jam-nut c'. The cap c serves to support a disk or plate d, which passes with its contracted end d' through an opening arranged in the same. Between the flat end of the plunger and the plate d is interposed a plate or disk e, preferably consisting of hardened tool-steel, which serves as a bearing-plate for punches f, arranged in the openings d^2 of the plate d, and thus forms an unyielding support for the same and one of the means which confines the punches in the plate d. The portion d^3 of the openings d^2 of the plate d adjacent to the contracted end d' thereof is preferably threaded to permit of the insertion of an externally-threaded nipple or lock-nut h, which bears against the under side of a head f' of the punches f. Thus the punches f, by means of the bearing-plate e and nuts h, are immovably held in position in the supporting-plates d, and if it becomes necessary to remove one, or even all, of the punches f this can readily be accomplished by merely removing the lock-nuts h from the supporting-plate d, after which the punches f either drop out or may be readily lifted from the same without disengaging the cap c from the respective plungers a or b. To assist in the quick removal of one or more of the punches from their respective holders A, formed by the cap c, supporting-disk d, and bearing-disk e, without removing the same from the plunger, each of the nuts h is provided with a groove h', into which may be inserted a suitably-shaped tool.

The lower punches f are guided at their free ends in a die i, inserted in a block k, in which the feed-shoe l of the tablet-machine

slides. The feed-shoe *l* serves to conduct material into the die *i*, which is compressed therein by the punches *f*, and the tablet formed by the compressed material is then ejected from the die *i* by the lower punches. The resistance offered by the material to the punches during the compression thereof is directly transmitted to the bearing-plate *e* and by the same to the lower end of the respective plungers. As the bearing-plate is unyieldingly clamped between the plunger and the supporting-disk *d* and since the punches *f* cannot move sidewise in the plate *d*, it follows that the same are prevented from assuming an oblique position with respect to the holder A, and thus the main cause of the breaking of the punches *f* is eliminated, and by rendering the punches accessible and removable from the exterior of their holder A the necessity of removing the holder for this purpose from the respective plunger *a* or *b* has been efficiently overcome.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a punch-holder for tablet-machines, a plunger, means having openings adapted to receive punches, means for connecting said receiving means to said plunger, and means engaging said receiving means for holding said punches in position in the openings thereof and for forcing the same against said plunger.

2. In a punch-holder for tablet-machines, a plunger, means provided with openings adapted to receive punches, means for connecting said receiving means to said plunger, and means engaging said receiving means for holding said punches in position therein and for forcing the same against said plunger, said engaging means, receiving means and plunger coöperating to prevent side movements of the punches.

3. In a punch-holder for tablet-machines, a plunger, a disk having openings, certain portions of the walls thereof being threaded, punches having heads engaging the unthreaded portions of the openings, lock-nuts for engaging the threaded portions of the openings of said disk and for holding the punches in position therein by forcing the same against said plunger, said lock-nuts arranged when removed, from said disk to permit of the disconnection and reinsertion of the punches from and into said disk, and a cap engaging said disk and connecting the same with said plunger.

4. In a punch-holder for tablet-machines, a plunger having a cap removably secured thereto, a disk mounted in said cap and extending therethrough having openings for the reception of punches, a second disk forming a bearing-plate for the punches and for holding the same in position in said first disk by closing the openings at their upper ends, and lock-nuts arranged in the openings of said first disk for locking the punches thereto and for forcing the same against said second disk.

5. In a punch-holder for tablet-machines, a plunger having an externally-threaded portion, a cap removably secured thereto, a disk and plate arranged in said cap and held by the same in engagement with each other and end of said plunger, said disk having openings to receive punches and permit the same to bear against said plate, and lock-nuts inserted in said openings for removably holding the punches in said plate and permitting of disconnection and reinsertion without disengaging the cap from said plunger.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

EMANUEL L. RICHARDS.

Witnesses:

J. WALTER DOUGLASS,

THOMAS M. SMITH.