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A. L. STOWELL

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PUNCH

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Fig. 1

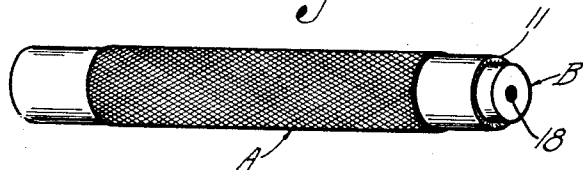


Fig. 2

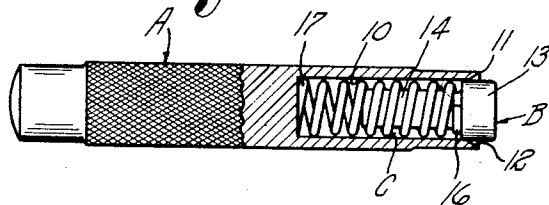
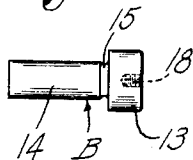


Fig. 3



Inventor
Austin L. Stowell

By

H. C. Lindsey

Attorney

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PUNCH

Austin L. Stowell, New Britain, Conn., assignor
to The Stanley Works, New Britain, Conn., a
corporation of Connecticut

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4 Claims. (Cl. 164—124)

This invention relates to a punch, such as used by shoemakers and the like, for forming holes or openings in sheet material, such as leather.

5 The aim of the invention is to provide a punch of this sort having various features of novelty and advantage and which is particularly characterized by its effectiveness in operation and its simplicity in construction.

10 More particularly, an aim of the invention is to provide a punch, the cutting edge of which is so disposed and constructed that, during the operation of forming a hole, the material about the hole is not unduly stretched or deformed.

15 A further object of the invention is to provide a punch with a plunger for ejecting the slug or portion cut from the material, the plunger being associated with the body portion of the punch in a very simple and effective manner, the arrangement being such that the structure may be very economically manufactured as it comprises but a relatively few number of parts, each simple in itself, and which parts may be readily assembled.

25 Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing, wherein is shown one embodiment which the present invention may take:

35 Figure 1 is a perspective view of the complete structure;

Fig. 2 is a side view thereof, the forward end of the punch being a central longitudinal section; and

40 Fig. 3 is a side elevational view of the plunger per se.

Referring to the drawing in detail, A designates generally the body portion of the punch which is preferably in the form of a round bar or cylinder having a longitudinal bore 10 in its forward end. The extreme forward end of the punch body terminates in a cutting edge 11, which is preferably formed by internally chamfering the forward end of the punch body, as at 12. The external wall of the cutting edge is substantially cylindrical, while the internal wall thereof is tapered inwardly. With this arrangement, when a hole is punched in the material, 55 the hole will be made the exact size as the

cutting edge of the punch, the slug in the cutting operation being somewhat compressed and forced into the chamfered portion 12. There is no tendency to stretch or enlarge the hole, as would be the case if the punch had an external chamfer terminating in a cutting edge. 60

For the purpose of ejecting the slugs or disks after they are cut from the material, a spring pressed plunger B is provided. This plunger has a head 13 fitting loosely in the forward end of the bore 10, and a rearwardly extending stem 14. Within the bore 10 is a spring C, the rear end of which bottoms against the inner end of the bore and the forward end of which engages against the rear shoulder of the head 13. The stem 14 adjacent the head 13, has an annular groove 15, and the foremost turn or convolution 16 of the spring C is somewhat contracted so that it engages in this groove, and thus accidental separation between the spring and the plunger is prevented. The body portion of the spring fits loosely in the bore 10 so that it is free to contract and expand, but the rearmost coil or convolution 17 of the spring is normally of greater diameter than that of the bore so that, when the spring is inserted into the bore, the end convolution is somewhat compressed and, due to its tendency to expand radially, this convolution will exert sufficient frictional force against the wall of the bore to prevent the spring and plunger from accidentally coming out of the bore. The forward end of the plunger may have a small threaded recess 18, the purpose of which is to facilitate removal of the plunger and spring from the punch body. This can be done by merely screwing a threaded stem into the recess and then pulling outwardly on the stem. 80

It will be seen from the foregoing description, taken in connection with the accompanying drawing, that my improved arrangement is an extremely simple one making for economy in manufacture. The device comprises but three parts, namely the body, the plunger and the spring, and each of these parts may be made at a relatively low cost. The parts may be very easily and quickly assembled, it being apparent that the spring may be engaged with the plunger by merely reducing the diameter of the forward end of the spring so that it will fit in the groove 15. The plunger and spring are assembled within the bore by merely bringing the rear end of the spring into the chamfered end 12 and then pushing backwardly on the plunger, thereby causing the rearmost convolution 17 to contract. No separate means are necessary for 110

holding the spring and plunger in place, as the radial pressure of the end convolution 17 against the wall of the bore is sufficient to perform this function.

- 5 As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the
10 above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

- It is also to be understood that the language used in the following claims is intended to cover
15 all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

- 20 1. In a punch, a body member having a cutting edge and a bore at one end, a plunger at the forward end of said bore, and a spring in said bore and connected to said plunger, the inner end of said spring being contracted into
25 said bore when inserted therein whereby said end of the spring will exert sufficient frictional force against the wall of the bore to prevent accidental displacement of the spring.

- 30 2. In a punch, a body member having a cutting edge and a bore at one end, a plunger in the forward end of said bore, and a coiled spring behind said plunger and within said bore, the

forward end of said spring being connected to said plunger and the inner end of said spring being normally of greater diameter than that of the bore so that when the spring is inserted into the bore the rear end thereof is contracted and caused to bear frictionally against the bore wall. 80

3. In a punch, a body member having a longitudinal bore and a cutting edge at one end, a plunger in the forward end of said bore and having a rearwardly extending stem provided with a circumferential groove, and a coiled spring in said bore behind said plunger, the forward end of said spring being engaged in said groove whereby to connect the spring and plunger together, the rear end of said spring being normally of greater diameter than the diameter of the bore. 85 90

4. In a punch, a body member having a longitudinal bore and a cutting edge at one end, a plunger in the forward end of said bore and having a head and a rearwardly extending stem, said stem adjacent said head being provided with a circumferential groove, and said head having a threaded recess, and a coiled spring in said bore behind said plunger, the forward end of said spring being engaged in said groove whereby to connect the spring and plunger together; the rear end of said spring being normally of greater diameter than the diameter of the bore. 95 100 105

AUSTIN L. STOWELL.

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