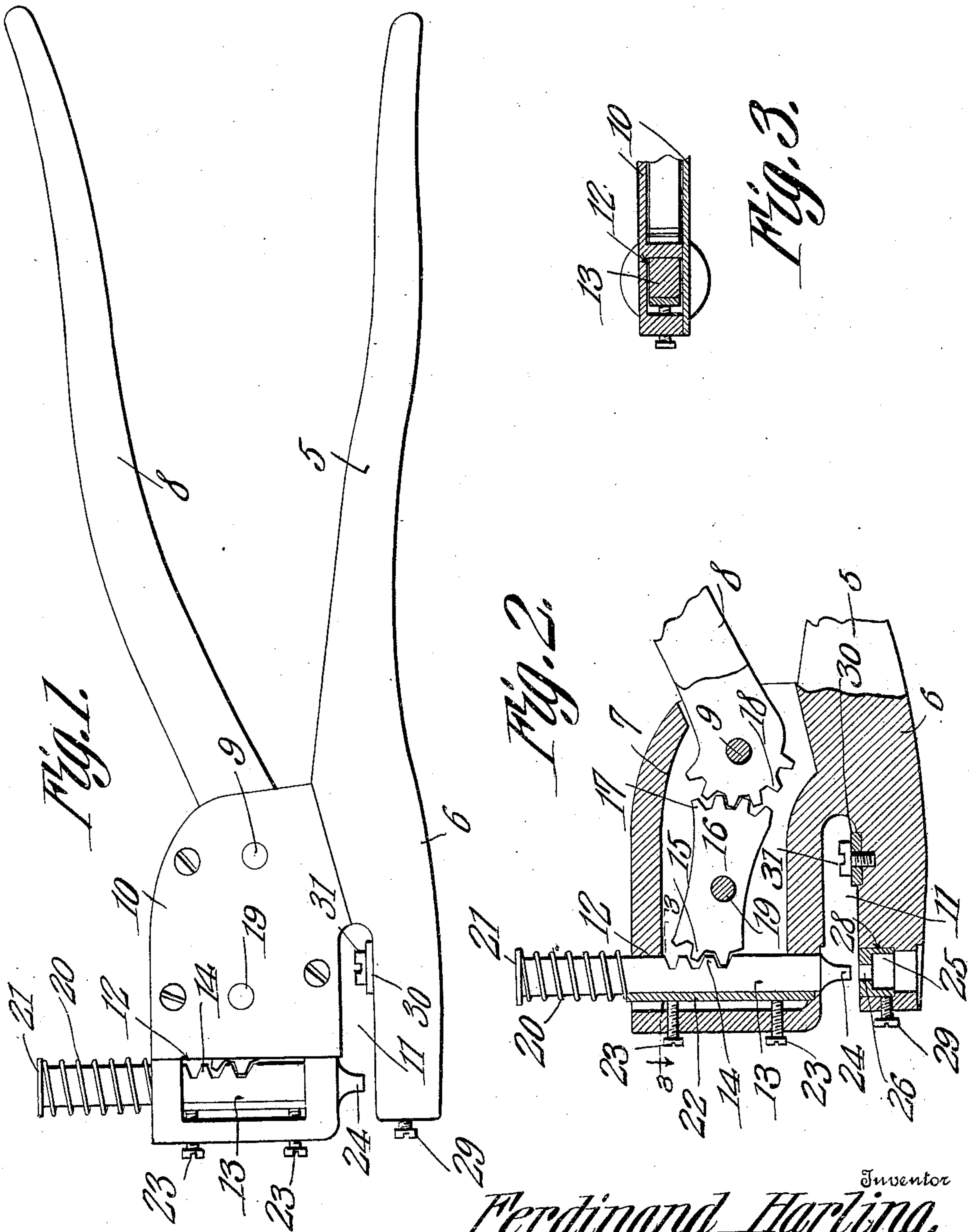


F. HARLING.  
PUNCH.

APPLICATION FILED MAR. 8, 1909.

938,580.

Patented Nov. 2, 1909.



Witnesses

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# UNITED STATES PATENT OFFICE.

FERDINAND HARLING, OF SHENANDOAH, IOWA.

PUNCH.

938,580.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed March 3, 1909. Serial No. 481,209.

*To all whom it may concern:*

Be it known that I, FERDINAND HARLING, a citizen of the United States, residing at Shenandoah, in the county of Page and State of Iowa, have invented a new and useful Punch, of which the following is a specification.

It is the object of the present invention to improve generally the construction of punches such as are employed in forming rivet holes and the like in sheet metal, and the mechanism embodying the invention is directed more especially to the hand class of punches.

One of the objects of the invention is to provide a punch in which the plunger or punch may be readily removed and a new plunger or punch having a different sized point may be substituted therefor.

It is a further object of the invention to provide for direct feed of the plunger or punch in a line with the axis of the opening in the die or bed of the tool, so that there will be no tendency for the point of the plunger or punch to bind against the wall of the said opening.

In the accompanying drawings:—Figure 1 is a view in side elevation of the punch embodying the invention. Fig. 2 is a vertical sectional view in detail, through one end of the punch. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 2.

In the drawings one handle of the punch embodying the invention is indicated by the numeral 5 and is provided at one end with an integral head 6, which is recessed as at 7, the other handle of the punch, indicated by the numeral 8, being pivoted as at 9 between the cheek pieces 10 of the recessed portion of the head. The head 6 is provided with a recess 11 which extends inwardly from the forward edge thereof and opens also through the sides of the said head and is adapted for the reception of the edge of the sheet to be punched, and the head is further formed in its portion extending above the recess or slot 11 with a barrel 12, in which is slidably received the plunger or punch stem 13 of the tool. The punch or plunger 13 is rectangular in cross section, and the bore of the barrel is correspondingly formed so as to receive the punch or plunger and prevent its rotation.

As clearly shown in Fig. 2 of the drawings, the plunger is held to work against the rear face of the bore of the barrel 12, and

has its rear face formed with a rack portion 14, meshing with which are the teeth 15 at one end of a segmental gear 16. The teeth 17 at the other end or edge of the segmental gear 16 are in mesh with teeth 18, formed upon the forward or pivoted end of the handle 8, and it will be understood that upon swinging the handle 8 upon its pivot in the direction of the handle 5, the segmental gear 16 will be rocked upon its axis 19 in a manner to force the plunger 13 directly downwardly in the barrel 12. The plunger 13 is normally held elevated however by means of a spring 20, which is engaged thereon and bears at its lower end against the upper edge 6 of the tool, and at its upper end against a head 21 at the upper end of the plunger. As heretofore stated the plunger is held for sliding movement against the rear wall of the barrel 12, and disposed against the forward side of the plunger, for the purpose of holding it in the position stated, is a plate 22, which is of the same width as the barrel 12, and of substantially the same length, there being set screws 23 threaded through the forward wall of the barrel and bearing against the said plate to hold it in the position stated.

It will be observed, from an inspection of Fig. 2 of the drawings, that the barrel 12 in the head 6 is of greater depth from front to rear than the thickness of the plunger 13, and that the plunger is held normally in position to slide within the barrel solely through the instrumentality of the plate 22 and the set screws 23 bearing thereagainst, it being understood however that, by loosening these set screws and withdrawing the plate 22, the plunger may be shifted forwardly in the barrel until its rack portion is out of mesh with the teeth 15 at the forward edge of the segmental gear 16, and that the plunger may then be readily withdrawn from the barrel and another plunger substituted, having a larger or smaller punch point. The punch point of the plunger is indicated by the numeral 24.

The bed or die of the punch tool is indicated by the numeral 25 and is preferably cylindrical and hollow, and is formed in its top with an opening 26 of the proper diameter, it being understood that a number of these dies are to be provided with each tool, and that the openings 26 correspond in diameter to the diameter of the several punch points or plungers also provided with each



tool. The die 25 is held in position in a socket 28 in that portion of the head 6 which underlies the recess or slot 11, by means of a set screw 29, it being understood that the edge of the sheet to be punched is inserted in the said slot or recess 11, and that the handle 8 is then swung in the direction of the handle 5, so as to bring the punch point 24 down upon the sheet and perforate the same.

In connection with the tool, there is provided, preferably, a gage 30, which is secured preferably by means of a set screw 31, upon the upper face of the portion of the head last mentioned, and at a point inwardly of the socket 28 of the said portion of the head, the edge of the plate to be punched being disposed against this gage prior to manipulating the handle 8, whereby the openings punched in the plate may be properly relatively positioned.

What is claimed is:—

1. In a tool of the class described, a handle member, a barrel carried thereby, a plunger fitted in the barrel, the plunger being of a diameter considerably less than that of the barrel, means in that portion of the barrel not occupied by the plunger for normally confining the plunger in the barrel, and means for actuating the plunger.

2. In a tool of the class described, a handle member, a barrel carried thereby, a plunger in the barrel, the said plunger being of rack formation, a gear meshing with the rack of the plunger, whereby to actuate the latter, the plunger being of a diameter considerably less than that of the barrel, means in that portion of the barrel not occupied by the plunger normally holding the plunger with its rack in mesh with the gear, said means being releasable to permit movement of the plunger to position with its rack portion out of mesh with the gear, and means for actuating the gear.

3. In a tool of the class described, a handle member, a barrel carried thereby, a plunger in the barrel, said plunger being of a diameter considerably less than that of the barrel, means engaging the plunger whereby to actuate the same, means in that portion of the barrel not occupied by the plunger normally holding the plunger in engagement with the first mentioned means, the last mentioned means being releasable to permit movement of the plunger away from the first mentioned means.

4. In a tool of the class described, a handle member, a barrel carried thereby, a plunger fitted in the barrel, the plunger being of a diameter considerably less than that of

the barrel, means engaging the plunger operable to actuate the same, and adjustable means in that portion of the barrel not occupied by the plunger engaging with the plunger and holding it normally in engagement with the first mentioned means.

5. In a tool of the class described, a handle member, a barrel carried thereby, a plunger fitted in the barrel, the plunger being of a diameter considerably less than that of the barrel, means engaging with the plunger operable to actuate the same, a plate removably disposed within the barrel and against the plunger, and means in that portion of the barrel not occupied by the plunger and the plate bearing against the plate to hold the plunger normally in engagement with the first mentioned means.

6. In a tool of the class described, a handle member, a barrel carried thereby, a plunger fitted in the barrel, the plunger being of a diameter considerably less than that of the barrel, means in that portion of the barrel not occupied by the plunger normally confining the plunger in the barrel, a handle pivoted to the first mentioned handle, and a segmental oscillatory gear interposed between the plunger and the last mentioned handle, whereby to actuate the plunger upon the movement of the handle in one direction.

7. In a tool of the class described, a handle member, a barrel formed upon the member, a plunger fitted in the barrel and between opposed walls thereof, a plate disposed between the said walls of the barrel and against the plunger, the plunger resting also against a third wall of the barrel, means for holding the plunger in position against the last mentioned wall of the barrel, and a second handle member pivoted to the first handle member and operable to actuate the plunger.

8. In a tool of the class described, a handle member, a barrel carried thereby, a plunger in the barrel, the plunger being of a diameter considerably less than that of the barrel, means in that portion of the barrel not occupied by the plunger normally confining the plunger in the barrel, and means for actuating the plunger, the first mentioned means serving to hold the plunger normally in operative relation to the second mentioned means.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FERDINAND HARLING.

Witnesses:

EARL R. FERGUSON,  
A. P. BROPP.