

G. M. AINSWORTH.
 CENTER PUNCH.
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913,677.

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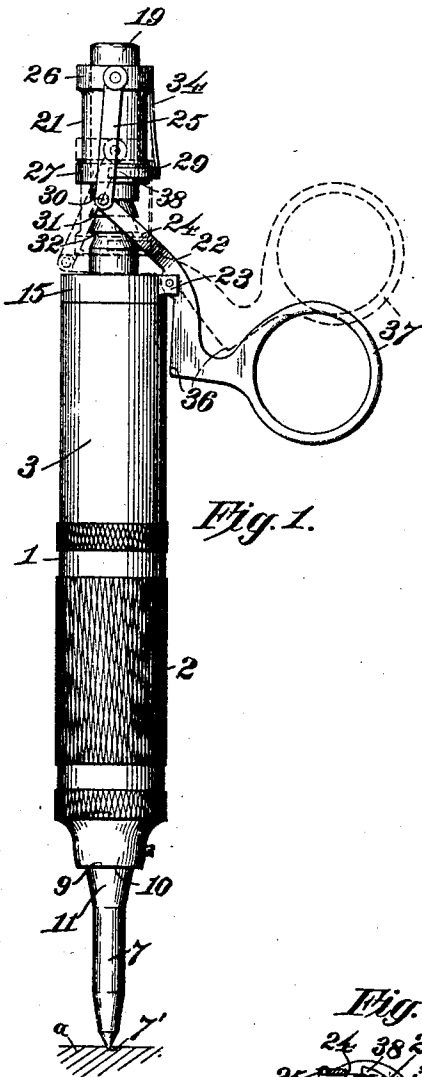


Fig. 1.

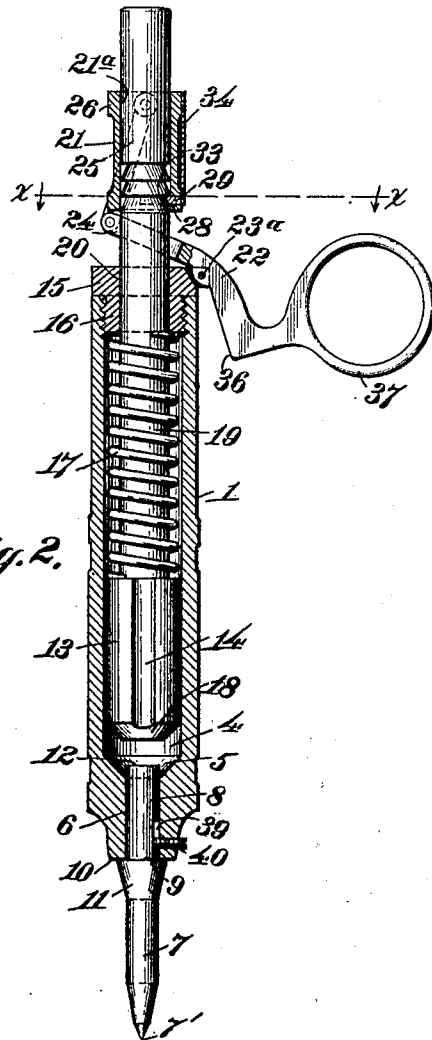


Fig. 2.

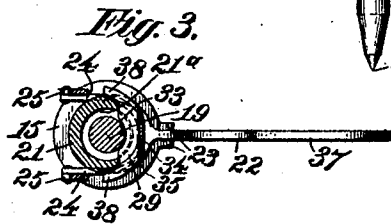


Fig. 3.

Witnesses

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CENTER-PUNCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE M. AINSWORTH, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Center-Punches, of which the following is a specification.

My invention relates to center punches, and the object of my invention is to provide a center punch provided with a hammer which may be raised by a single movement of the finger and then automatically released.

A further object of my invention is to provide a device as mentioned in which the hammer may be raised to the extent necessary to give a blow of the desired force, and then automatically released.

A further object of my invention is to provide a center punch characterized as mentioned which shall not be injured by operating the hammer when not in use, and one which shall be of simple construction and of low cost of manufacture.

Other objects will appear hereinafter.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification and in which,

Figure 1, is a side elevation of a center punch embodying my invention in its preferred form, the parts being in the position they assume after the hammer is released, Fig. 2, is a section of the punch illustrating the hammer partially raised and Fig. 3, is a section on the line $x-x$ of Fig. 2.

Referring to the drawings, 1 indicates the body portion of the device. This comprises a hollow cylindrical member which is knurled or roughened upon its outer face, as at 2, forming a handle or grip portion. The knurled portion 2 may be co-extensive with the outer surface of the member 1, but I prefer to have the same arranged toward or at the lower end only where it is engaged by the three outer fingers of the hand holding the same, the forefinger of the same hand being used to actuate the hammer as hereinafter described. By providing the upper portion of the member 1 with a smooth surface 3, the device may be more comfortably operated, as the fore or operating finger, the thumb and the portion of the hand between the operating finger and said thumb will not become chafed by rubbing against a roughened surface. Also by providing the roughened portion or grip at the lower end, the operator

will be led to grasp this portion which places the device in the best position for readily and easily actuating the hammer.

The body 1 is provided with a cylindrical bore 4 terminating near the lower end in a dished or conical shoulder 5 and a reduced and co-axial bore 6. Upon the lower end of the body portion, is the tool or punch proper 7, having a stem 8 extending into the bore 6. The punch is provided with a shoulder 9, between the portions 7 and 8 which rests against the preferably reduced lower end 10 of the portion 1 when the punch is pressed against the work, designated at a in Fig. 1. The shoulder 9 is preferably formed by the upper face of an annular flared collar 11 formed integrally with the punch. The stem 8 is somewhat longer than the bore 6 in order that its upper end shall extend above the face of the shoulder 5 and into the path of the hammer, when in operative position. To prevent injury to the punch by operating the hammer when not in use, the stem 8 of the punch is slidably mounted in the bore so that its upper end will drop below the shoulder 5 except when the punch is held against the work, at which times said shoulder serves as a stop for the hammer.

13 indicates the hammer, which is arranged within the bore 4 and is of but slightly less diameter than the same. The hammer is provided with longitudinal grooves 14 which are of sufficient size to prevent compression of air beneath the hammer which would lessen the force of the blow. The upper end of the body 1 is closed by a head 15 having a depending portion 16 threaded into the upper end of the bore 4 forming a plug, between which and the upper end of the hammer, is arranged a spring 17. When the hammer is raised and then released the spring drives the same forcibly against the upper end 12 of the stem of the punch, or against the shoulder 5 as the case may be. It should be noted that the lower end of the hammer is shaped as at 18 to conform to the shoulder 5, that is, the hammer is provided with an inverted frusto-conical lower end.

The hammer is provided with a stem 19 which is quite long and extends through a bore 20 in the head 15 and a considerable distance above said head, forming a guide-way for the hammer raising device. The hammer raising device comprises a sleeve 21 slidably mounted on the upper or projecting

end of the stem 19 and having a device for engaging said stem to raise the same as said sleeve is raised and an actuating lever 22 pivotally mounted between ears 23 on the head 15. The head 15 is of the same diameter as the body 1, forming a smooth outer surface, and ears 23 preferably project from the periphery thereof. The inner or work end of the lever is bifurcated forming the two arms 24—24 upon each side of the stem 19; which are connected by links 25 to the sleeve 21. The sleeve 21 is provided with an upper and lower collar or rib 26—27 respectively, and the upper ends of the links 25 are pivotally connected to the upper rib 26. The links 25 are of such length that the arms 24 of the lever rest upon the upper face of the head 15 when the sleeve 21 is in lowermost position. The lower end of the sleeve, and upon the side adjacent to the lever is horizontally slotted as at 28, said slot extending through the ribbed portion 27 and into the bore 21^a of the sleeve. Mounted in the slot 28 is a pawl 29 which is adapted to engage notches 30, 31 and 32 formed in the stem 19 above the head 15. The inner edge of the pawl 29 is curved as at 33 to conform to the stem 19. The edge 33 is beveled as shown in Fig. 2, and the walls of the annular notches or grooves 30, 31 and 32 are correspondingly inclined forming the ratchet connection between the sleeve and the stem, permitting free downward movement of the sleeve but which prevents the same from rising without also raising the stem and the hammer. Fixed to the rib 26 is a spring 34 which bears against the pawl 29, its lower end resting in a notch 35 formed in the pawl.

The lever 22, after it passes the pivot point 23^a, is bent downwardly forming a shoulder 36 and then outwardly terminating in an eye or ring 37 to receive the forefinger of the hand holding the tool. It is obvious that by drawing down on the lever the sleeve 21 will be raised, and the ratchet having engaged the stem, the hammer will be raised. The upward movement of the sleeve is limited by the shoulder 36 of the lever engaging the body 1 of the tool.

As the sleeve 21 approaches the upward limit of its movement, the pawl 29 is disengaged from the stem, permitting the hammer to drop. To this end the pawl 29 is provided with extensions 38, one upon each side of the sleeve 21, which are engaged by the links 25 when the sleeve reaches its uppermost position, as shown in Fig. 1.

The operation of the device is as follows: The body of the tool is grasped in the hand with the forefinger extended through the ring 37 and the point 7' is pressed firmly against the work *a* at the desired point. The lever 22 is then raised by the forefinger until the pawl 29 engages one of the annular

notches 30, 31 or 32. The lever 22 is then drawn down by the forefinger, raising the hammer against the tension of the spring 17. As the sleeve 21 approaches the uppermost position the links 25 swing inwardly almost to a vertical position and by engaging the extensions 38 of the pawl moves said pawl out of engagement with the notched stem. The spring 17 then drives the hammer forcibly against the upper end 12 of the punch stem. The force of the blow may be regulated by engaging the pawl 29 with one or the other of the notches 30, 31 or 32. It should be noted that the pawl is released at the same point in either case but that by engaging the pawl with the notch 30 the hammer is raised but a comparatively short distance, whereas by engaging the notch 31 it is raised a greater distance, and when the notch 32 is used it is raised to the greatest height, the blow of the hammer increasing accordingly. To prevent separation of the punch tool from the handle or body portion, the stem 8 is notched or recessed at 39 and a pin 40 is threaded through the reduced end 10 of the body portion and extends into said notch. The notch 39 is of sufficient length to permit the end 12 of the stem to pass below the shoulder 5 when not in use.

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

1. A center punch comprising a body portion forming a handle and a punch at one end thereof, in combination with a spring actuated hammer arranged within said handle, a stem on said hammer projecting through the end of said handle opposite from said punch, a lever pivotally mounted on the end of said handle adjacent to the projecting end of said stem for raising said hammer, said lever being shaped to form a stop to engage the side of said handle to limit the movement of the lever and a ring on the end of said lever, substantially as described.

2. A center punch comprising a body portion forming a handle and a punch arranged at one end thereof, in combination therewith a hammer arranged within said body portion, a stem on said hammer extending through the opposite end of said body from said punch, a sleeve slidably mounted on the projecting end of said stem, means operable by a finger of the hand grasping the tool for raising and lowering said sleeve, a ratchet connection between said sleeve and said stem, and means for breaking said connection as said sleeve reaches uppermost position, substantially as described.

3. A center punch comprising a body portion forming a handle and a punch arranged at one end thereof said handle being hollow and closed at the opposite end from said punch by a head, in combination with a hammer arranged within said handle, a spring inter-

posed between said hammer and said head, a stem on said hammer extending through said head and projecting beyond the same, a sleeve slidably mounted on the projecting end of said stem, a ratchet connection between said sleeve and said stem, a lever for raising and lowering said sleeve, a link connecting said lever and said sleeve said link being adapted to break said ratchet connection when the sleeve reaches uppermost position, substantially as described.

4. A center punch comprising a tubular body portion forming a handle, said body portion being open at the top, in combination with a punch tool arranged at the opposite end, a plug threaded into said open end

and having a central bore, a hammer arranged within said handle and having a stem extending through said bore, a spring interposed between said hammer and said plug, an operating lever pivotally mounted on said plug and a suitable connection between said lever and said stem, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of subscribing witnesses.

GEORGE M. AINSWORTH.

Witnesses:

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