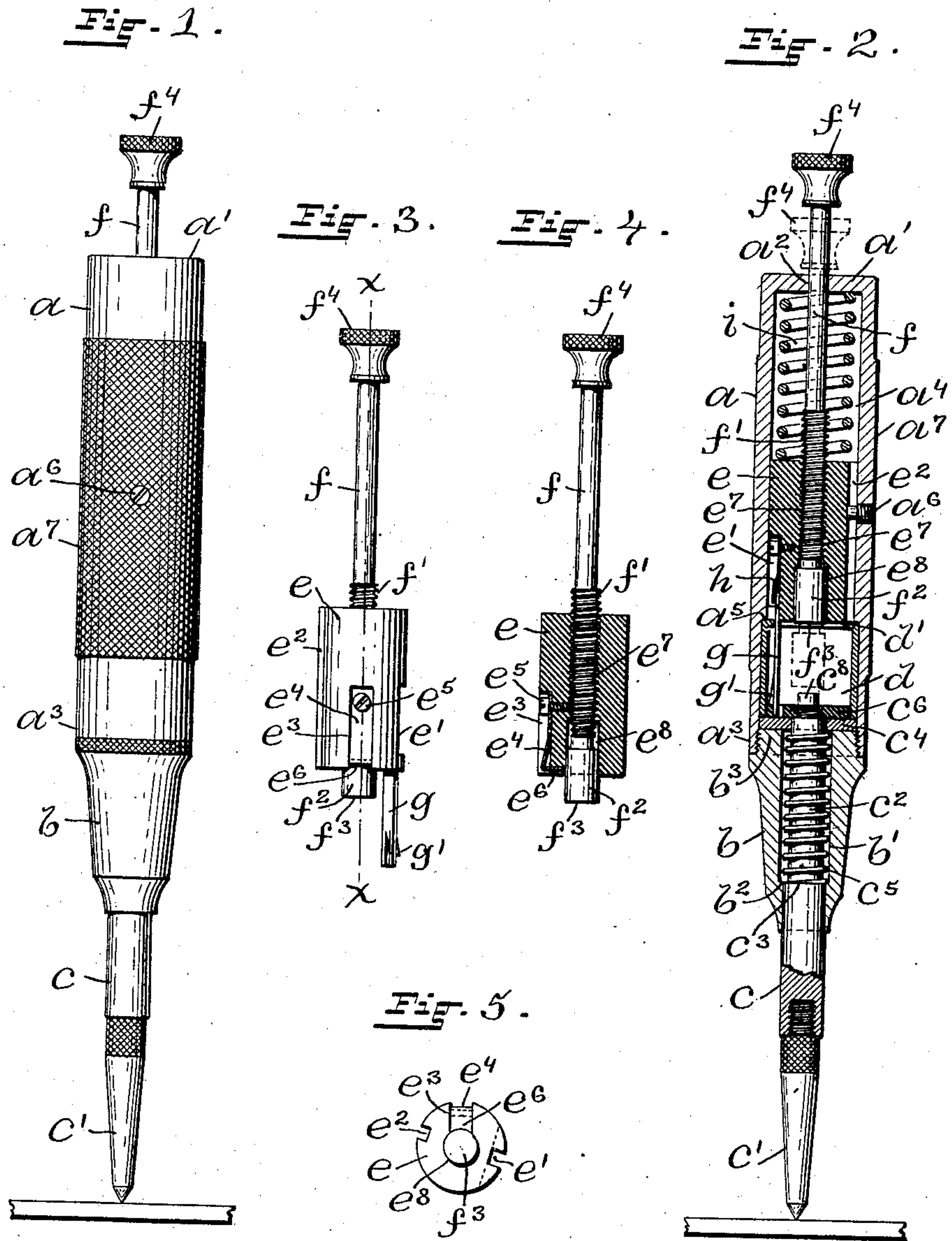


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PATENTED JUNE 2, 1908.

F. SPALDING.
AUTOMATIC CENTER PUNCH.
APPLICATION FILED OCT. 26, 1904.



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AUTOMATIC CENTER-PUNCH.

No. 889,409.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK SPALDING, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Automatic Center-Punches, of which the following is a specification.

This invention has reference to an improvement in automatic center punches for machinists' use, and more particular to an improvement in means for controlling the blow given by the automatic hammer in the punch.

The automatic center punch to which my invention is particularly applicable consists of a hollow cylindrical handle, a spring actuated hammer in the handle, a tubular tip secured by screwing it into the open end of the handle, a spring-pressed pointed punch rod in the tubular tip having a cap on its inner end in which is an off-set aperture, a thimble having a hole forming an inwardly-extending circular lip its top placed intermediate the hammer and the inner end of the tubular tip to form a stop for the hammer, and a pawl pivotally secured to the hammer under spring tension adapted to enter the off-set aperture in the cap on the punch rod, said pawl having a beveled tooth adapted to engage with the edge of the off-set aperture to hold the hammer when depressing the handle and to engage the inwardly-extending lip on the thimble to release the hammer which, actuated by a coiled spring, strikes the upper end of the pointed punch rod and drives the pointed end of the rod into the article to be centered or indented.

The object of my invention is to provide an automatic centering or prick punch with means for controlling the blow of the hammer, whereby a light or heavy blow is struck on the pointed punch rod and a shallow or deep indentation made at will in the article to be centered or indented.

My invention consists in the peculiar and novel construction of the hammer of an automatic center punch, said hammer having a stem screw-threaded centrally through the hammer and extending outwardly through an aperture in the end of the handle, (the inner end of the stem forming the face of the hammer) a knob on the outer end of the stem for turning the stem, means for preventing the turning of the hammer in the handle, and

means for exerting a spring tension on the stem, whereby the face of the hammer may be adjusted from or toward the inner end of the punch rod and the blow of the hammer varied at will from zero to the full force of the hammer, as will be more fully set forth hereinafter.

Figure 1 is a side view of an automatic center or prick punch provided with my improvement for giving a variable force to the blow of the hammer. Fig. 2 is a sectional view taken lengthwise through the punch, showing the operative parts of the punch in their normal position, the adjustable face of the hammer in the position for the hammer to give its hardest blow in full lines and in the position for the lightest blow in broken lines. Fig. 3 is a side view of the hammer and its adjusting mechanism removed from the punch. Fig. 4 is a sectional view of the hammer and its mechanism taken on line X X of Fig. 3, and Fig. 5 is an end view looking at the adjustable face of the hammer.

In the drawings, *a* indicates a hollow cylindrical handle, *b* a tubular tip on the lower end of the handle, *c* a push rod in the tubular tip, *d* a stop and pawl releasing thimble, *e* a cylindrical hammer, *f* a screw-threaded stem in the hammer the lower end of which forms the adjustable face of the hammer, *g* a flat metal pawl, *h* a flat spring, and *i* a heavy coiled spring intermediate the tip of the hammer and the closed end of the handle.

The handle *a* has the closed end *a'* in which is the central aperture *a''* for the stem *f*; the internal screw-threaded open end *a'''*, the cylindrical bore *a''''* stepped to form the shoulder *a'''''*, the screw-threaded pin *a''''''* extending inwardly from the side of the handle, and the knurled surface *a'''''''* to facilitate the holding of the punch.

The tubular tip *b* has the longitudinal hole *b'* stepped to form the shoulder *b''* and is secured to the handle by screwing the inner screw-threaded end *b'''* into the internal screw-threaded end *a'''* of the handle.

The punch rod *c* has the separable pointed end *c'* secured by screwing it into the outer end of the punch rod, and the reduced portion *c''* forming the shoulder *c'''* extends upwards through the hole *b'* in the tip and a washer *c''''* on the inner end of the tip *b*. A light coiled spring *c''''''* surrounds the reduced portion *c''* and abuts on the shoulder *c'''* and the washer *c''''*. A cap *c''''''* having an off-set ap-

erture is secured by screwing it onto the protruding upper end c^8 of the punch rod c over the washer c^4 .

The stop and pawl releasing thimble d consists of a cylindrical shell having the inwardly-extending circular lip d' on the top. It is held in the cylindrical bore of the handle intermediate the shoulder a^5 and the washer c^4 .

The cylindrical hammer e has the recess e' cut in the side of the hammer to form a lip on the lower end of the hammer which in turn is cut through the center to form oppositely-disposed lugs, the longitudinal slot e^2 in the side of the hammer adapted to engage with the screw pin a^6 to prevent turning of the hammer, the recess e^3 in the side of the hammer in which is the flat spring e^4 secured at the upper end by the screw e^5 and having the inwardly-bent lower end e^6 , and the screw-threaded central hole e^7 enlarged at its lower end to form the circular chamber e^8 for the head on the lower end of the stem f forming the face of the hammer.

The stem f has the screw-threaded portion f' in screw-thread engagement with the hole e^7 in the hammer, the cylindrical head f^2 the end of which forms the face f^3 of the hammer, and the knurled knob f^4 on the outer end of the stem. The head f^2 is adjusted in or out in the chamber e^8 by turning the knob f^4 .

The flat metal pawl g has the beveled tooth g' adjacent the lower end and is pivotally held at its upper end to the hammer under spring tension by the oppositely-disposed lugs on the hammer, and the flat spring h which is secured at its upper end to the hammer by a screw. The lower end of the pawl enters the off-set aperture in the cap c^6 . The heavy coiled spring i is placed intermediate the top of the hammer e and the closed end a' of the handle a , as shown in Fig. 2.

When the operative parts of the punch are in their normal position the thimble d forms a stop for the hammer e and holds the washer c^4 between the inner end b^3 of the tubular tip b and the lower end of the thimble. The pawl g extends downward through the thimble and into the off-set aperture in the cap c^6 with the beveled tooth g' on the pawl engaging with the upper outer edge of the aperture in the cap.

In the operation of the punch provided with my improvement the operator places the point of the end c' in position on the article to be centered or indented, and depresses the handle a by pushing down on the handle. The hammer e is held by the pawl g , the light coiled spring c^5 is compressed between the shoulder c^3 and the washer c^4 , and the heavy coiled spring i is compressed between the top of the hammer e and the closed end a' of the handle. When the handle is depressed to its limit the beveled tooth g'

on the pawl g engages with the lip d' on the thimble d which, acting on the beveled edge of the tooth, disengages the tooth on the pawl from the off-set aperture in the cap c^6 . The hammer e now descends under the impulse of the heavy coiled spring i , and the face f^3 of the hammer strikes a blow on the upper end c^8 of the punch rod c , forcing the point of the end c' into the article to be centered or indented. The size or depth of the indentation in the article is regulated by turning the knob f^4 to move the face f^3 of the hammer toward or away from the upper end c^8 of the punch rod. With the face f^3 flush with the end of the hammer, as shown in full lines in Fig. 2, the hammer gets its full movement and the hardest blow is struck, and by screwing the face f^3 out of the hammer into the position as shown in broken lines, the lightest blow is struck on the punch rod. Any variation or force of blow between these extremes may be given by adjusting the position of the face f^3 on the hammer relative to the upper end of the punch rod. The inwardly-bent end e^6 of the spring e^4 is in frictional contact with the head f^2 on the stem f to prevent accidental rotation of the stem, and the pointed end c' may be easily removed for grinding or other purposes. As the hammer e descends to strike the blow the pawl g passes through the off-set aperture in the cap c^6 . When the pressure on the handle is released the hammer e comes to a stop on the thimble d , the handle rises to its normal position by the tension of the light coiled spring c^5 , and the pawl g acting under the tension of the flat spring h moves outward to bring the tooth g' on the pawl into engagement with the edge of the aperture in the cap, when the handle has reached its upward limit and brought the cap into its normal position.

By the use of my improvement in automatic center punches a variety of sizes or depths of indentures may be made by the same punch, and a more useful center punch is constructed than has heretofore been done.

Having thus described my invention, I claim as new and desire to secure by Letters Patent;—

1. In an automatic center punch, a spring pressed punch rod, a pointed end removably secured to the punch rod, a spring actuated hammer, means for automatically operating the hammer, means for regulating the blow of the hammer consisting of a stem screw-threaded through the hammer, a head on the end of the stem the end of which forms the face of the hammer, whereby a rotatable movement of the stem moves the head toward or from the adjacent end of the punch rod, and means for preventing the hammer from rotating, as described.

2. The combination with an automatic center punch having a hollow cylindrical handle closed at one end, a tip screw-

threaded into the open end of the handle, a
spring pressed punch rod extending through
the tip, a pointed end removably secured to
the punch rod, a spring actuated hammer in
5 the handle, of means for regulating the blow
of the hammer consisting of a stem screw-
threaded through the hammer and extend-
ing through an aperture in the closed end of
the handle, a head on the inner end of the
10 stem the end of which forms the face of the
hammer, a knob on the outer end of the stem
whereby a rotatable movement of the knob
moves the face of the hammer toward or
from the adjacent end of the punch rod,
15 means for exerting a spring tension on the
stem, and means for preventing the hammer
from turning in the handle, as described.

3. In an automatic center punch, the com-
bination of a handle *a*, a tip *b*, a punch rod *c*

having the removable pointed end *c'*, the 20
washer *c⁴*, the coiled spring *c⁵* and the cap *c⁶*,
a cylindrical hammer *e* having the recess *e'*,
the slot *e²*, the recess *e³*, the spring *e⁴* secured
by the screw *e⁵* and having the inwardly-
bent end *e⁶*, the screw-threaded central hole 25
e⁷ merging into the circular chamber *e⁸*, the
stem *f* having the screw-threaded portion *f'*,
the cylindrical head *f²* the end of which forms
the face *f³*, the knob *f⁴* on the outer end of
the stem, the pawl *g*, the spring *h*, and the 30
coiled spring *i*, as described.

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

FRANK SPALDING.

Witnesses:

ADA E. HAGERTY,
J. A. MILLER, Jr.