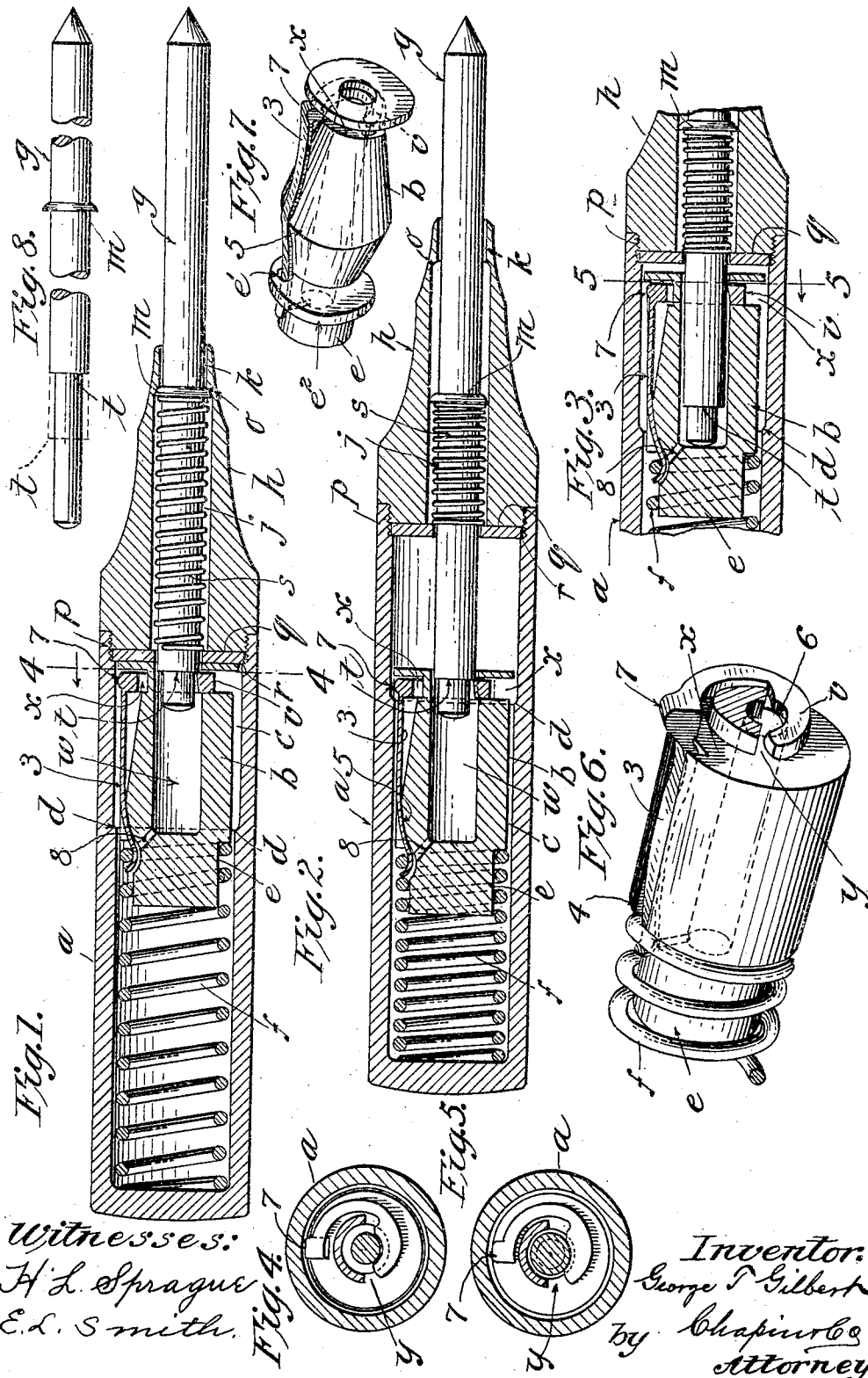


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G. T. GILBERT.
AUTOMATIC PRICK PUNCH.
APPLICATION FILED MAY 27, 1906.



UNITED STATES PATENT OFFICE.

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AUTOMATIC PRICK-PUNCH.

No. 813,641.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE T. GILBERT, a citizen of the United States of America, residing at Northampton, in the county of Hampshire and State of Massachusetts, have invented new and useful Improvements in Automatic Prick-Punches, of which the following is a specification.

This invention relates to automatic prick-punches; and the object thereof is to provide a tool of this class in which the construction is much simplified and the cost of manufacture reduced.

The invention will be fully described in the following specification and the novel points of the construction clearly pointed out in the claims appended thereto, and the invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a prick-punch, showing the position of the parts in a state of rest. Fig. 2 is a similar view showing the position of the parts with the hammer-actuating spring compressed and just prior to the release thereof. Fig. 3 is a view similar to Figs. 1 and 2, showing the position of the parts after the release of the hammer and when the latter has been shot forward against the end of the punch. Fig. 4 is a transverse section on line 4 4, Fig. 1, looking in the direction of the arrow. Fig. 5 is a like sectional view to Fig. 4, the plane of the section being on line 5 5, Fig. 3. Fig. 6 is a perspective view of the hammer and trigger and a part of the hammer-spring, the forward end of the hammer being cut off in the plane of the section of line 4 4 on Fig. 1. Fig. 7 is a perspective view showing a modification of the hammer construction. Fig. 8 is a view of the end of the punch, showing the location of the shoulder thereon, with which the trigger engages in different locations relative to the end of the punch.

Referring to the drawings, *a* indicates a shell, circular in cross-section, closed at one end and constituting the handle of the tool. Located within the shell is a cylindrically-shaped hammer *b*, which has an easy sliding fit in the shell for almost its entire length, the open end of the shell being counterbored to a larger diameter, as indicated by *c*, for a certain distance, and while the forward end of the hammer extends into this counterbored portion when it is in the position shown in

Fig. 1 the rear end never slides entirely out of the smaller bore therein.

The rear end of the hammer is turned down, as at *e*, to receive one end of the coiled spring *f*, which extends in its distended condition to the bottom of the bore in the handle. This spring *f* is the hammer-actuating spring, by the reaction of which after compression the blow is struck on the inner end of the punch *g*. The open end of the handle is closed by a solid metal plug *h*, which is bored out axially to receive the punch *g*, this plug being suitably tapered at the forward end thereof toward the punch.

The hole bored through the plug is indicated by *j* and is reduced in diameter near the forward end thereof, as at *k*, the resulting shoulder *o* constituting an abutment for the collar *m* on the punch, this collar preferably being made integral with the latter.

The rear end of the plug *h* is threaded, as at *p*, and screwed into the open end of the handle, a loose disk *q* being inserted in the open end of the latter and bearing against the shoulder *r*, formed by cutting the screw-threads in the end of the shell, and it is held in that position by the plug. This disk *q* is bored out to receive the rear end of the punch and serves as a support therefor and as an abutment for the spiral spring *s*, located between said disk or washer and the collar *m*, the punch having a sliding fit in the washer. The function of this spring is merely to return the punch to the extended position shown in Fig. 1 after it has been forced backward to the position shown in Fig. 2 ready to receive the blow of the hammer.

The rear or inner end of the punch is turned down for a certain distance to provide a shoulder *t* thereon, whereby by means of the trigger (indicated as a whole by *v*) the punch is prevented from sliding into the hole *w*, bored in the hammer axially thereof from the forward end partly through it. This trigger is so arranged that if the point of the punch be held against the work and pressure be applied to the end of the handle the hammer *b* will be pressed back into the handle, compressing the spring *f* until the trigger comes in contact with the shoulder *d*, whereupon the trigger will be forced out from under the shoulder *t* of the punch, and the hammer will be then shot forward by its spring against the inner end of the punch, the latter enter-

ing the hole *w*, the position of the parts at the moment of impact of the hammer on the punch being that shown in Fig. 3.

To provide for the reception of the trigger 5 and its spring-arm, (these two parts preferably being made in one piece, as shown,) the forward end of the hammer has a circumferential groove *x* turned therein near its forward end, a portion of the body on the 10 hammer at the bottom of said groove being cut away, as indicated at *y*, Fig. 6, said cut-away portion intercepting the hole *w* in the hammer, whereby the trigger *v* may through the opening into said hole be located in position to engage the shoulder *t* on the inner end 15 of the punch. Furthermore, this annular groove *x* in the forward end of the hammer provides space in which to locate the circular trigger, whereby it may slide with the hammer 20 within the handle and yet be free to play transversely of the line of the movement of the hammer to release the latter at the proper time.

The trigger, as shown very clearly in the 25 drawings, consists of an annular head having an opening at one side, which head lies in the groove *x* and is provided with a spring-arm 3, extending in a groove 4 lengthwise of the hammer back toward and past the shoulder, 30 formed by turning down the end *e* of the hammer, the extremity of the spring being located under a coil or coils of the hammer-spring *f*.

The groove 4 is so formed as to provide a 35 high point 5 therein toward its rear end, over which the spring-arm 3 of the trigger will be flexed more or less when the parts are assembled. This has a tendency to always hold the circular trigger in engagement with 40 the shoulder *t* on the inner end of the punch.

It will be noted that the trigger extends partly around the punch, and in one side of the trigger is cut a semicircular groove 6, as 45 shown in Figs. 4, 5, and 6 particularly, which fits substantially the contour of the punch, whereby the engagement between the punch and the trigger will be an effective one, and this groove 6 is opposite that part of the circular trigger to which the spring-arm 3 is 50 located, and at the angle formed by the union of said arm with the trigger a rounded boss 7 is formed which extends outwardly and always bears against the wall of the handle part *a*, and it is this boss 7 which comes in 55 contact with the shoulder *d* at the end of the rearward movement of the hammer and forces the opposite portion of the trigger out of engagement with the shoulder *t* on the end of the punch.

60 In order that the parts may operate without undue friction, due to any binding effect between them, the inner end of the punch is made to have a rather close sliding fit in the hole *w* in the hammer, and when these parts 65 are oiled up any air which may be drawn into

the hole *w* by the suction effect of the punch acts as a cushion to prevent the hammer from striking with full force thereon. Therefore to prevent the compression of any air in said hole in the hammer the vent-hole 8 is 70 provided, which extends from the bottom of the hole *w* out through the wall of the hammer toward the rear end thereof, as shown.

In making the prick-punches for various 75 uses the weight of the blow struck by the hammer may be regulated by locating the shoulder *t* on the punch at different distances from the inner end of the punch, whereby the distance which the hammer must move before striking the punch may be increased 80 or diminished. Fig. 8 illustrates this.

It is to be observed that the punch never extends outwardly so far as to entirely leave the hole *w* in the hammer, and therefore the forward end of the latter bearing on the 85 punch is always maintained in axial alignment with that part of the shell in which the rear end thereof is supported. To dismount this tool, the plug *h* is first unscrewed and it and the punch removed, together with the 90 loose disk *g*. The hammer and its spring *f* may then be drawn out of the shell and the spring *f* separated from the hammer, when the trigger and its spring-arm may be easily disengaged from the hammer. 95

Fig. 8 shows a modification of the hammer construction whereby the expense of milling the groove 4 therein to provide the high point 5 may be obviated and whereby the hammer may thus be made on a screw-machine. This consists in merely turning off 100 the body of the hammer toward each end to leave the high point 5 thereon, over which the spring-arm 3 may be sprung, as described, the ends of the hammer being left full size to 105 fit the bore of the handle. In this construction the end of the spring-arm would pass through a hole *e'* in the circular flange *e'* on the rear end of the body, resulting from thus turning down the latter, as stated. 110

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an automatic prick-punch, a hammer, a hollow handle in which the hammer 115 is slidable, a trigger located in an annular groove in the hammer, and a spring to move said trigger transversely of the axis of the hammer, a punch extending into a cavity in the hammer having a shoulder thereon with 120 which said trigger may engage to hold the punch and hammer in separated relation, there being a shoulder on the inner wall of the handle which operates to move the trigger out of engagement with the punch at the 125 proper time, and a suitable spring for the punch to move the latter away from the hammer.

2. In an automatic prick-punch, a hollow handle, a hammer slidable therein and hav- 130

ing in the surface thereof an annular groove;
and a longitudinally-disposed groove inter-
cepting said annular groove, there being an
opening extending from the bottom of the an-
5 nular groove into a cavity in the hammer a
punch extending into the said cavity in the
hammer; a trigger consisting of a circular head
to fit said annular groove, and an arm ex-
tending from said head at right angles there-
10 to located in said longitudinal groove and

constituting a spring for the trigger, the hol-
low handle having one end closed in which
said hammer and punch are independently
slidable, and a spring between the closed end
of the handle and the end of the hammer.

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Witnesses:

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K. I. CLEMONS.