Sept. 9, 1924. 1,507,783

E. E. LUCE

QUICK CHANGE PUNCH

Filed Jan. 21, 1922

FIG-1—

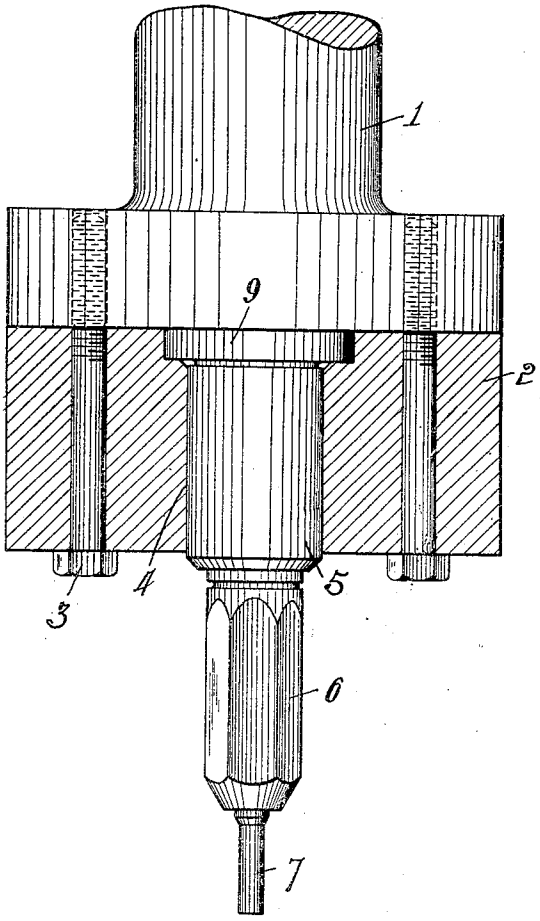



FIG-2—

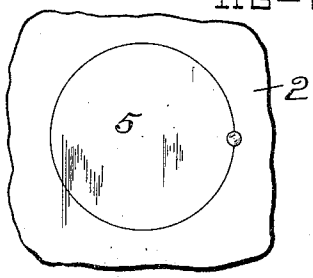



FIG-3—

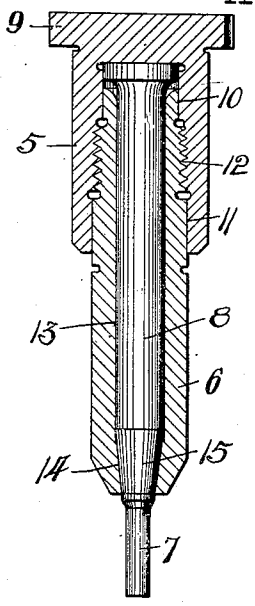



FIG-4—

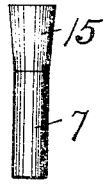
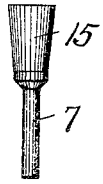



FIG-5—




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# UNITED STATES PATENT OFFICE.

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## QUICK-CHANGE PUNCH.

Application filed January 21, 1922. Serial No. 530,781.

*To all whom it may concern:*

Be it known that I, EMMETT E. LUCE, a citizen of the United States, and a resident of Swanton, in the county of Fulton and State of Ohio, have made an invention appertaining to a Quick-Change Punch; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the characters of reference marked thereon, which form a part of this specification.

This invention relates particularly to punches of the type used in connection with punch presses, and has for its object the provision of a punch having a detachable punch point which is capable of being easily and quickly changed to suit the size of hole to be punched or to substitute a new point for a worn or broken one, thereby effecting a very material saving of the time, labor and expense necessary to exchange punches of the type heretofore used.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Fig. 1 is a fragmentary side elevation of a punch press plunger with a punch embodying the invention clamped thereto and with the clamping plate in section. Fig. 2 is a fragmentary view of the inner side of the clamping plate with a punch secured therein. Fig. 3 is a central longitudinal section of a punch embodying the invention with parts in full, and Figs. 4 and 5 are side views of punch points of different sizes adapted to use in the punch.

Referring to the drawings, 1 designates the punch carrying spindle or plunger of a punch press, and 2 a punch clamping plate secured to the outer end of the spindle by screws 3, or in any other similar manner. The plate 2 is provided with an opening 4 having an undercut inner edge portion for receiving and clamping the socket member of the punch to the spindle.

A punch embodying the invention comprises a socket or body member 5, a punch point holder 6 removably carried by the socket member, a punch point 7 releasably carried by the holder, and a thrust bar 8 constituting a punch support and which is mounted in the holder 6 with its outer end thrust against the inner end of the punch point and its inner end thrust against the solid wall or base of the socket member.

The socket member 5 is of a size adapted to project through the clamping plate hole 4 and has its inner end, which bears against the spindle end, provided with a flange 9 for entering the undercut edge portion of the hole. The outer end of the member 5 is axially socketed and the inner end of the holder 6 is intended to have a turning fit therein, the two members having a ground fit at the inner end portion of the socket, as shown at 10, and a ground fit at the outer end portion of the socket, as shown at 11, with the portions intermediate the bearing portions 10 and 11 in threaded engagement, as shown at 12. The diameter of the bearing surfaces 10 is less than the diameter of the threaded portions of the two members to permit the inner end of the holder 6 to be inserted into the socket beyond its threaded portion. Connecting the two body members 5 and 6 of the punch in this manner provides an extended bearing coaction therebetween which prevents relative lateral movements thereof.

The holder 6 is provided axially therethrough with an opening 13 for receiving the punch support 8 and the outer end of such opening is conically restricted, as shown at 14, to receive the outward thrust of the conical body or base portion 15 of a punch point 7, the outer work punching end of such point being projected beyond the end of the holder. The outer side of the holder 6 without the socket member 5 is preferably provided with flattened surfaces therearound to facilitate gripping the same with a wrench.

The punch point support 8 is of cylindrical bar form adapted to loosely fit in the holder opening 13 with one end preferably enlarged and bearing against the base or solid wall of the socket in the member 5 and with the other end bearing against the inner end of the punch point 7 to hold its conical portion firmly seated in the conical opening 14 when the holder is screwed home in the socket member. The enlarged end of the punch support 8 is engaged with the inner side bearing surface 10 of the socket.

It is evident that this manner of securing the punch point to the holder provides a firm

and rigid mounting for the point, as the socket member 5 is firmly clamped against movement relative to the punch spindle 1, the holder 6 is firmly mounted against lateral movements relative to the socket member and the punch point is firmly held to its seat in the tapered portion of the holder by the thrust of the bar 8 thereagainst. To remove a punch point from the holder it is only necessary to unscrew the holder 6 from engagement with the socket member 5, withdraw the thrust bar 8 therefrom, and turn the holder in position for the punch point to pass therethrough towards its inner end and drop therefrom by gravity after which a different point may be inserted in the holder and the parts again assembled in operative relation.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of embodiment in numerous forms without departing from the spirit of the claims.

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

1. In a punch, a member having a socket which is spaced from the inner end of the member to form a solid wall and which extends through the outer end of the member, said socket being threaded at its central portion and having the portions thereof between the ends of the threaded portion and the ends of the socket ground to form inner and outer side bearing surfaces, a holder having an intermediate threaded portion engaged with said central threaded portion of the socket and having inner and outer ground portions to engage the respective inner and outer side bearing surfaces of the socket with a close ground fit, said holder having an axial bore, a punch point carried by the outer end of the holder, and a punch support fitted in the bore of the holder and having one end engaged with the inner end of the punch point and having its opposite end enlarged and extending over the inner end of the holder and engaged with the said inner side bearing surface and solid wall of the socket.

2. In a punch, a member having a socket which extends through the outer end of the member, said socket being threaded at its central portion and having the portions thereof between the ends of the threaded portion and the ends of the socket ground to form inner and outer side bearing surfaces, a holder having an intermediate threaded portion engaged with said central threaded portion of the socket and having inner and outer ground portions to engage the respective inner and outer side bearing surfaces of the socket with a close ground fit, said holder having an axial bore, a punch point carried by the outer end of the holder, and punch supporting means removably engaged in the bore of the holder.

In testimony whereof I have hereunto signed my name to this specification.

EMMETT E. LUCE.