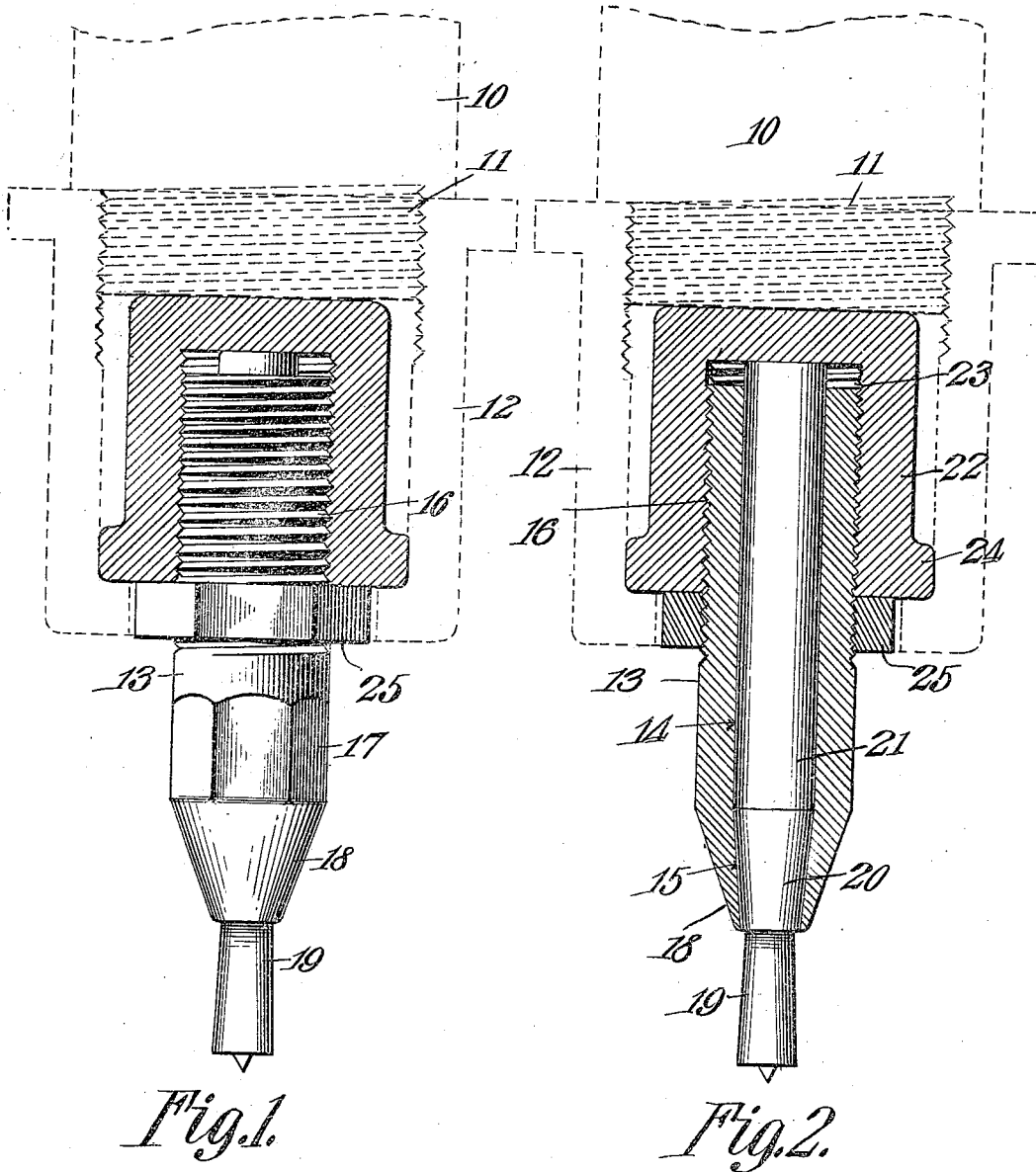


J. H. GAMBLE.
PRESS PUNCH.
APPLICATION FILED JUNE 10, 1908.

945,930.

Patented Jan. 11, 1910.



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UNITED STATES PATENT OFFICE.

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PRESS-PUNCH.

945,930.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed June 10, 1908. Serial No. 437,780.

To all whom it may concern:

Be it known that I, JAMES H. GAMBLE, a citizen of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, have invented a new and useful Press-Punch, of which the following is a specification.

This invention relates to press punches and its principal object is to provide a punch of the character described through the use of which the loss of the material, due to broken punches, will be minimized.

Another object of the invention is to provide a unitary punch for punching presses, in which but a small proportion of high grade tool steel shall be used.

A still further object of the invention is to strengthen the general construction of punch presses.

The invention consists in general of a punch built up largely of machine steel or a lower grade tool steel combined with a punch point of highly tempered high grade tool steel.

The invention consists further in certain novel details of arrangement and combination of parts, hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claim.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and; Figure 1 is a view of a punch press plunger showing the device applied thereto, the same being shown in section. Fig. 2 is a similar view with still other portions in section.

The numeral 10 indicates the plunger head which is provided with the usual threaded end 11. Mounted thereon is a holder 12 threaded interiorly and of the ordinary form. These parts are those used in the ordinary punching machine to hold the punch in position thereon, and form no part of the invention, but are merely illustrative of the manner of using the same.

The invention itself consists of a sleeve 13 provided with a centrally disposed longitudinal opening therethrough, this opening having a cylindrical portion 14, and a frusto-conical lower end as indicated at 15. Upon the upper end of the sleeve 13 are formed threads 16, and below the threaded end is preferably formed a nut 17 usually hexagonal in cross section. Below the nut 17 the sleeve is turned or otherwise formed

into a frusto-conical portion 18, the smaller diameter of which is but slightly larger than the smaller diameter of the frusto-conical portion 15 of the longitudinal opening through the sleeve. In the formation of the sleeve, which is preferably made either of a low grade of tool steel, or of machine steel, the sleeve is first drilled to the smaller diameter of the frusto-conical portion. This is then counterbored to the larger diameter of said frusto-conical portion and a taper reamer is then inserted and the lower end reamed out to form the frusto-conical portion. A punch 19, of the usual shape so far as the lower end is concerned, is constructed of a high grade of well tempered tool steel. This punch may be formed by turning from a bar of steel or may be forged in a suitable die. The upper end 20 of the punch is frusto-conical to fit the frusto-conical end of the opening in the sleeve. In this connection it is to be noted that the lower end of the punch must be of such size that it will pass through the smaller end of the frusto-conical opening 15. This punch is inserted in the sleeve by dropping the same in from the upper end. In the cylindrical portion of the sleeve opening 14, is held a distance block 21. This distance block is arranged so that it projects slightly above the upper end of the sleeve as clearly shown in Figs. 1 and 2. A cap 22 provided with a central recess 23 has suitable screw threads in that recess to engage the threaded portion of the sleeve 13. This cap is further provided with an annular flange 24. A lock nut 25 is carried on the threaded portion of the sleeve below the cap and serves to firmly hold the same in position when screwed on the sleeve.

In the operation of assembling the device the lock nut is first screwed on the sleeve from the top and positioned well down toward the lower end of the threaded portion. The punch point 19 is then dropped through the sleeve, and the distance block 21 positioned above the same. The sleeve is then screwed in the cap 22, and is forced down as far as possible so that it is brought into intimate contact with the distance block 21, which in turn is forced firmly against the frusto-conical portion 20 of the punch point 19. The lock nut is then screwed up against the sleeve and serves to prevent the same working loose at any time. The purpose of this is to make a unitary combina-

tion in which pressure applied to the cap will be transmitted directly to the point of the punch in a straight line, and in which no stress, other than that due to screwing the cap on the sleeve, will be brought on the threads on the sleeve or in the cap. It is also on this account that the end of the distance block 21 projects above the end of the sleeve, thus insuring contact between the cap and the said distance block. The device as thus assembled is held in the usual manner on the plunger, by the holder 12, this being clearly seen in Fig. 1.

Attention is called to the fact that by reason of the relatively small amount of high grade tool steel used in the construction of the invention, the loss through broken punch points is minimized. Another great point of advantage is that in case of a broken punch point, it is not necessary to reconstruct the entire device but it is simply necessary to disassemble the parts and insert a new punch point. A still further advantage of a device as constructed in this manner is that the lower end of the sleeve forms a brace and support for the punch point, and may be made as heavy as desired for that purpose. Owing, however, to its peculiar shape it is not necessary to employ a very heavy cross section for this purpose, the frusto-conical exterior acting as a cylindrical buttress to the punch at the point of greatest stress.

It is obvious that many changes may be made in the form and proportions of the device without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as properly come within the scope of this invention.

Having thus described the invention what is claimed as new, is:—

A press punch device comprising an externally threaded sleeve having a smooth cylindrical bore and a frusto-conical bore, communicating at one end with the cylindrical bore, a punch point having a frusto-conical portion to fit snugly within the frusto-conical bore of the sleeve, a distance block fitting snugly within the cylindrical bore of the sleeve and projecting above the same, an internally threaded cap receiving the threaded end portion of the sleeve and bearing against the projecting end of the distance block, and a lock nut upon the thread of the sleeve and bearing against the end of the cap.

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

JAMES H. GAMBLE.

Witnesses:

MARTHA SCHUMACHER,
AUGUST H. KLUENDER.