July 6, 1943. J. A. SMITH 2,323,756

PUNCH MOUNTING

Filed June 5, 1942

Fig. 1

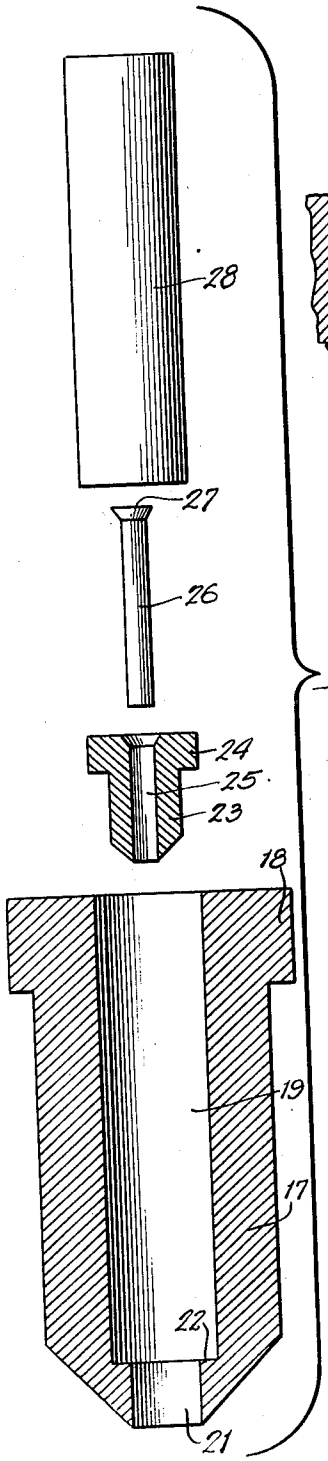
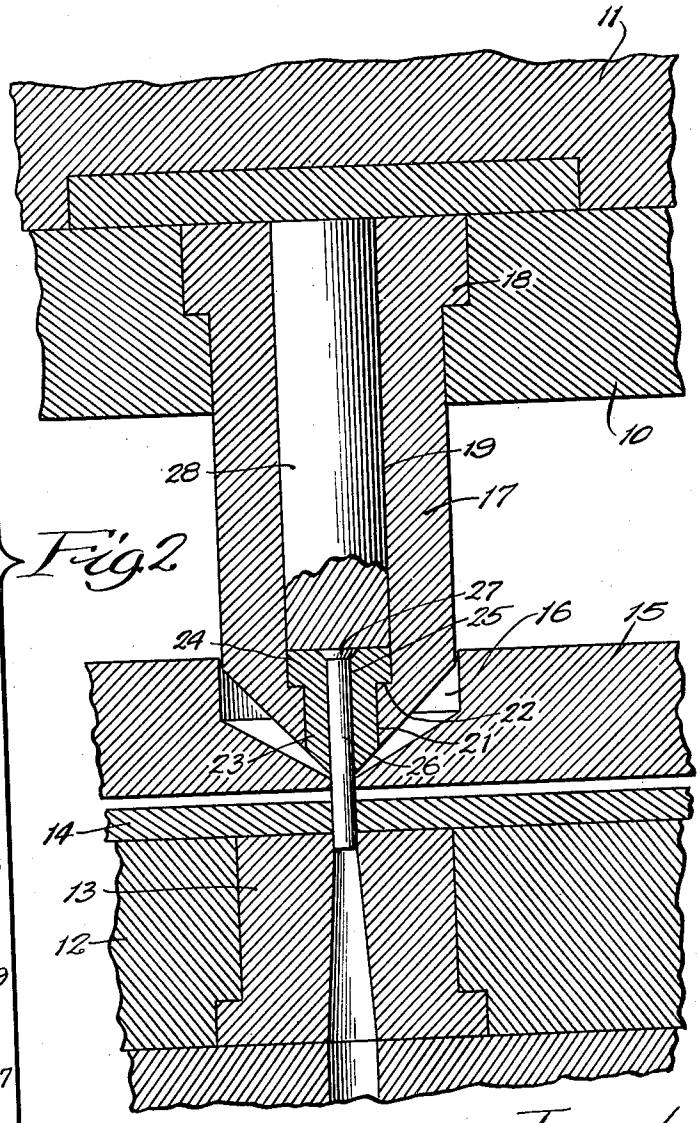


Fig 2.



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PUNCH MOUNTING

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1 Claim. (Cl. 164—124)

This invention relates to punch mounting and more particularly to mounting and supporting means for relatively small punches.

Punches and particularly relative small punches have been mounted in tubular quills accurately bored to receive and support the punches. In such constructions the punch extends completely through the quill requiring accurately machining of a relatively long quill bore and also a long punch accurately formed throughout.

Furthermore in very small punches for uses where a relatively long length is required between the punch holder and die it has been impossible to drill the quills because standard drills are too short and even with special drills it is substantially impossible to drill an accurate hole long enough. Various other constructions have, therefore, been used requiring complicated and expensive machining operations to support the punches. Such constructions have been further complicated by the necessity or extreme desirability of using standard size punches.

One of the objects of the present invention is to provide a punch mounting in which these difficulties are eliminated and in which a small punch of standard length can be rigidly and accurately supported at any desired distance from the punch holder.

Another object of the present invention is to provide a punch mounting in which the required accurate machining is reduced to a minimum and in which a relatively short punch may be employed.

Another object of the invention is to provide a punch mounting in which an outer quill supports a shorter inner quill which in turn carries the punch.

The above and other objects and advantages of the invention will be apparent from the following description when read in connection with the accompanying drawing, in which—

Figure 1 is a sectional view illustrating a punch embodying the invention; and

Figure 2 is a disassembled view of the punch parts with certain of the parts in section.

In the apparatus illustrated in Figure 1, a punch is adapted to be carried by a pad 10 which is secured to a holder 11 movable toward and from a base 12. The base carries a die 13 upon which stock 14 to be punched may rest. The stock lies between the base and a stripper plate 15 having a cavity 16 therein to receive the end of the punch and formed with an opening through which the punch may project.

The punch is adapted to be supported by an outer tubular quill 17 having an enlarged head 18 to be supported within and opening in the pad 10. The opening in the pad and the exterior cylindrical surface of the quill are accurately formed to locate the quill accurately on the holder.

The quill is formed with an interior cylindrical bore 19 extending throughout the major portion of its length and a smaller bore 21 adjacent its outer end connected to the bore 19 by an annular shoulder 22. The bore 21 is accurately formed as to size and concentricity with the outside of the quill 17 but the bore 19 need not be extremely accurate either as to size or concentricity.

A second small quill 23 is adapted to be mounted in the bore 21, and for this purpose has an accurately formed cylindrical exterior surface terminating in an enlarged head 24 adapted to lie within the bore 19. The shoulder 22 limits outward movement of the second quill relative to the outer quill. The second quill is formed with a cylindrical bore 25 to receive a short punch 26 projecting beyond the outer ends of the quills as shown. The punch is formed at its inner end with an enlarged head 27 fitting into a cavity at the inner end of the second quill to limit outward movement of the punch.

The punch and inner quill are held in place in the outer quill by means of a backing block 28 fitting in the bore 19 and seating against the inner ends of the quill 23 and the punch. The backing block may be a piece of cylindrical bar stock cut to the proper length just to fill the bore 19 above the head of the inner quill.

With this construction only the small bore of the outer quill need be accurately machined and the punch 26 may be made substantially shorter than the outer quill without sacrificing any of the advantages of the quill type mounting. If a punch needs to be replaced, either on account of breakage or normal wear, the backing block 28 may be removed from the outer quill, the inner quill may be removed from the outer quill and the punch may then be removed from the inner quill without removing the outer quill from the pad. A new punch may be inserted in the inner quill and the parts may then be reassembled as shown. Thus, by the present invention, smaller and less expensive punches may be utilized for the same punching operations and the required machining on both the punches and the supporting quills may be reduced to a minimum.

Since the bore 19 in the outer quill is relatively

large it can easily be drilled to any desired length. The bore **21** also being relatively large can be formed accurately and with no difficulty. The only small bore required is bore **25** in the inner quill which is relatively short so that it can be drilled without difficulty to accommodate a small size punch of standard length. In this way, the overall length of the assembly can be made as desired to utilize standard small punches and without requiring extremely long small diameter bores in the supporting structure.

Another advantage of the present invention is that it enables high grade high priced steel to be used in the punches with a maximum degree of economy. This is possible because the quills and backing block may be made of lower grade steels and the only part of the entire assembly in which high grade steel need be used is the small punch itself. Thus, the cost of the punches can be substantially reduced.

While one embodiment of the invention has been shown and described in detail, it will be understood that it is illustrative only and is not intended as a definition of the scope of the invention, reference being had for this purpose to the appended claim.

What is claimed is:

A punch comprising an elongated quill having a cylindrical bore therein reduced at its outer end to provide an internal shoulder the reduced portion of the bore being accurately formed to provide a guiding and locating surface, a solid inner quill having a head thereon to seat on the shoulder and a cylindrical body fitting in the reduced portion of the bore to be accuraely located thereby, the inner quill having an elongated bore of uniform section extending completely therethrough terminating at its inner end in a relatively short enlarged cavity, a punch fitting in the bore in the inner quill to be located thereby and having a head fitting in the cavity and terminating flush with the end of the inner quill, and a cylindrical block fitting in the first named bore and seating against the inner ends of the punch head and the inner quill.

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