June 3, 1930. A. E. GUERTIN 1,761,207

PUNCH

Filed July 26, 1928

Fig. 1.

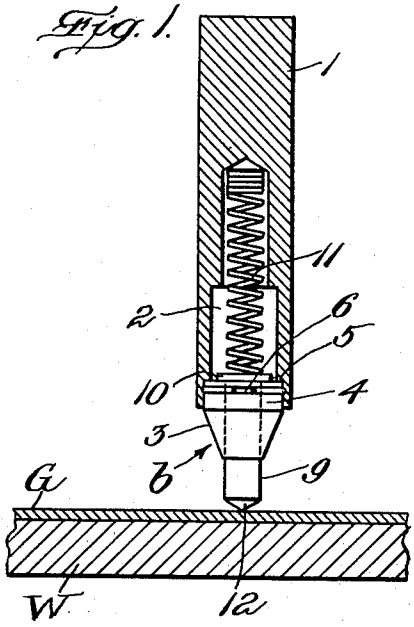


Fig. 2.

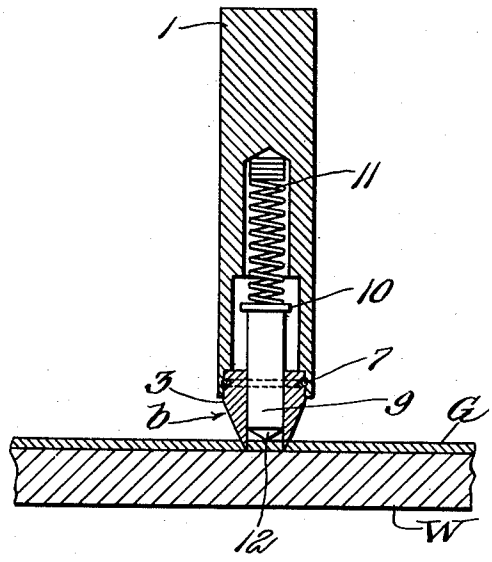


Fig. 3.

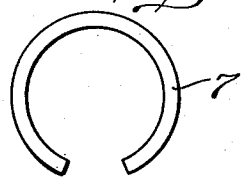
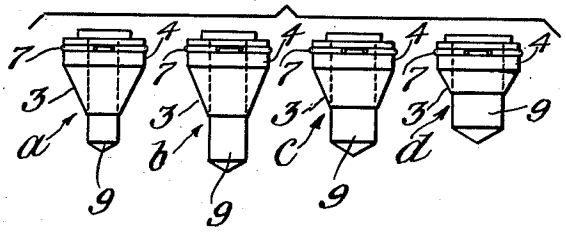


Fig. 5



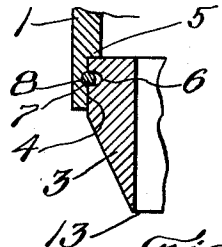


Fig. 4.

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Patented June 3, 1930 1,761,207

UNITED STATES PATENT OFFICE

AUGUSTUS E. GUERTIN, OF BELMONT, MASSACHUSETTS

PUNCH

Application filed July 26, 1928. Serial No. 295,487.

My invention relates to punches and particularly to punches for use in making gaskets and the like, the object of the invention being to provide an improved hand punch of this class by means of which bolt holes may be accurately and expeditiously formed in gaskets. It is also an object of the invention to provide a hand punch outfit or kit including a single cutter holder constructed with means whereby to separably couple or connect a cutter to the same, and a plurality of circular cutters of various sizes, either of which may be coupled to, or connected with, said holder so as to serve as a complementary part thereof.

To these ends I have provided an improved punch, and also an improved punching outfit or kit, having the peculiar features of construction and mode of operation set forth in the following description, the novel features of the invention being particularly pointed out and defined in the claim at the close thereof.

In the accompanying drawings:

Figure 1 is an elevation, partly in section, of my improved punch.

Figure 2 is a view like Fig. 1, but with the holder and its cutter shown in the positions occupied by them at the completion of the cutting stroke.

Figure 3 is a detail of the split ring hereinafter described.

Figure 4 is a sectional detail hereinafter described.

Figure 5 is a view showing a set of cutters for use with the holder hereinafter described.

The main feature of my invention resides in the construction of the improved punch shown in Figs. 1 and 2 with which I preferably provide a set of complementary cutting tools, or cutters, such as shown in Fig. 5.

The punch of Figs. 1 and 2 comprises a body 1 herein shown as a metal bar formed interiorly and at one end thereof with a chamber or socket 2. At its outer or lower end the chamber 2 is counterbored to adapt it to receive a circular cutter 3 that is part of a cutting unit. In Figs. 1 and 2 this cutting unit is designated *b* and in practice I provide a set of these units of different sizes as shown in Fig. 5.

The circular cutter 3 of each cutting unit is mainly of conical form but at its upper end is made with a cylindrical body portion 4 to fit within the counterbore at the lower end of the socket or chamber 2, said counterbore providing an annular shoulder 5 which serves as an abutment for the inner end of the circular cutter 3. The cylindrical portion 4 is formed upon its exterior with a circumferential groove 6 that is occupied by a split spring wire ring 7 that engages an annular groove 8 provided in body 1 adjacent the lower or outer end of the chamber 2, thereby to lock the cutter 3 to said body but with provision for removal of the cutter when changing from a cutter of one size to a cutter of another size. Thus by holding the body 1 and applying endwise force to the cutter it can be forced into, or withdrawn from, the chamber 2, the split ring 7 yielding to permit the same when sufficient force is applied as described.

The cylindrical body portions 4 of all of the cutters of Fig. 5 are of the same diameter so that either one of said cutters may be forced into position within the counterbore of the chamber 2 where it is locked and held against accidental loss by the split ring 7, and when it is desired to substitute another cutter of another size, the one that is in position within the holder can be withdrawn and the new cutter substituted very quickly.

The cutter 3 of each cutting unit is an annulus made with a cylindrical bore within which is slidably mounted a pilot-ejector plunger 9 provided at its inner end with a head 10 that is held against the inner end of the cutter annulus by means of a coiled spring 11 within chamber 2. The outer end of the pilot-ejector 9 is preferably bluntly pointed as at 12, and as shown in Figs. 1 and 5 a considerable length of the outer end portion of each pilot-ejector projects beyond its cutter annulus 3.

Thus, after properly marking on the gasket G the positions of the holes that are to be punched therein, the axis of the punching tool shown in Figs. 1 and 2 can be accurate-

ly positioned with respect to each mark by placing the point 12 on the latter. The holder or body 1 is then pushed downward until the lower cutting edge 13 of the cutter 3 rests on the gasket G whereupon the upper end of the holder or body 1 is struck with a hammer thereby driving the cutter through the gasket as shown in Fig. 2. When the tool is raised from the work the plunger 9 holds the "cut-out" down against the work support W, the spring 11 expanding as body or holder 1 is raised, until the head 10 at the inner end of the ejector-pilot 9 engages the inner end of the cutter annulus 3.

From the above description it will be clear that I have provided an improved punch which can be expeditiously and accurately operated, the plunger 9 serving the double purpose of a pilot for use in positioning the punch upon the work, and as an ejector for removing the "cut-out" from the cutting annulus.

It will also be clear that the above described outfit provides simple, inexpensive and efficient means for use in punching several different kinds of holes in gaskets or the like.

What I claim is:

A hand punch comprising a body member consisting of a bar of metal made interiorly with a chamber that extends to one end of said body, said chamber being formed to provide an annular shoulder adjacent said end and to provide an annular groove between said shoulder and said end; a cutter annulus having a body portion fitting telescopically within the outer end portion of said chamber and against said shoulder, said body portion being made upon its exterior with an annular groove registering with the groove within the chamber, and a resilient split ring loosely and permanently occupying the groove of the cutter annulus and removably confined within the groove of the chamber to separably hold the cutter annulus within the body member, a pilot-ejector plunger slidably mounted within said cutter annulus and provided at its inner end with a head engaging said annulus to limit its outward movement, and a spring within said chamber yieldingly holding said plunger at the limit of its outward movement with its outer end portion projecting beyond said cutter annulus.

Signed by me at Boston, county of Suffolk, State of Massachusetts, this 10th day of July, 1928.

AUGUSTUS E. GUERTIN.