July 3, 1928. 1,675,369

W. MESSINGER

HYDRAULIC PUNCH

Filed Feb. 19, 1927 2 Sheets-Sheet 1

FIG. 2.

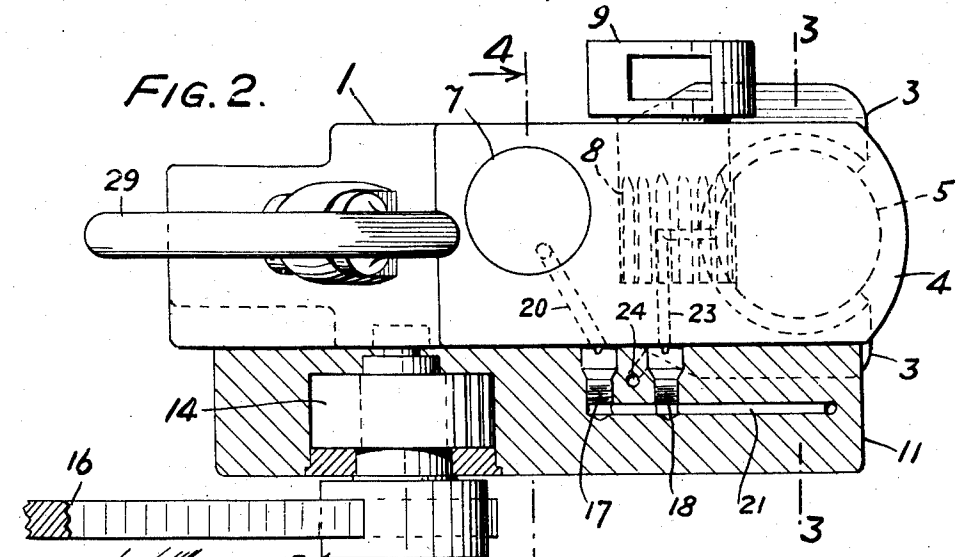
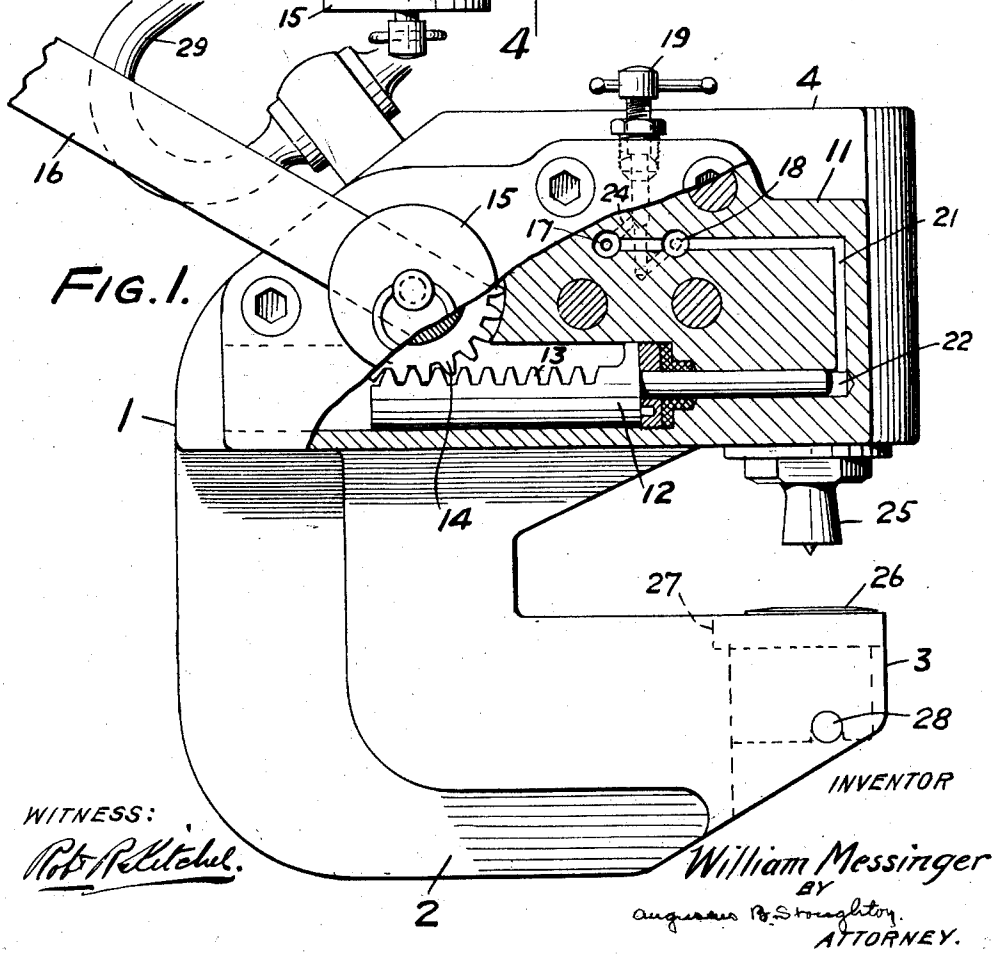


FIG. 1.



WITNESS:

Robt. R. Mitchell.

INVENTOR

William Messinger

BY

Augustus B. Stoughton.

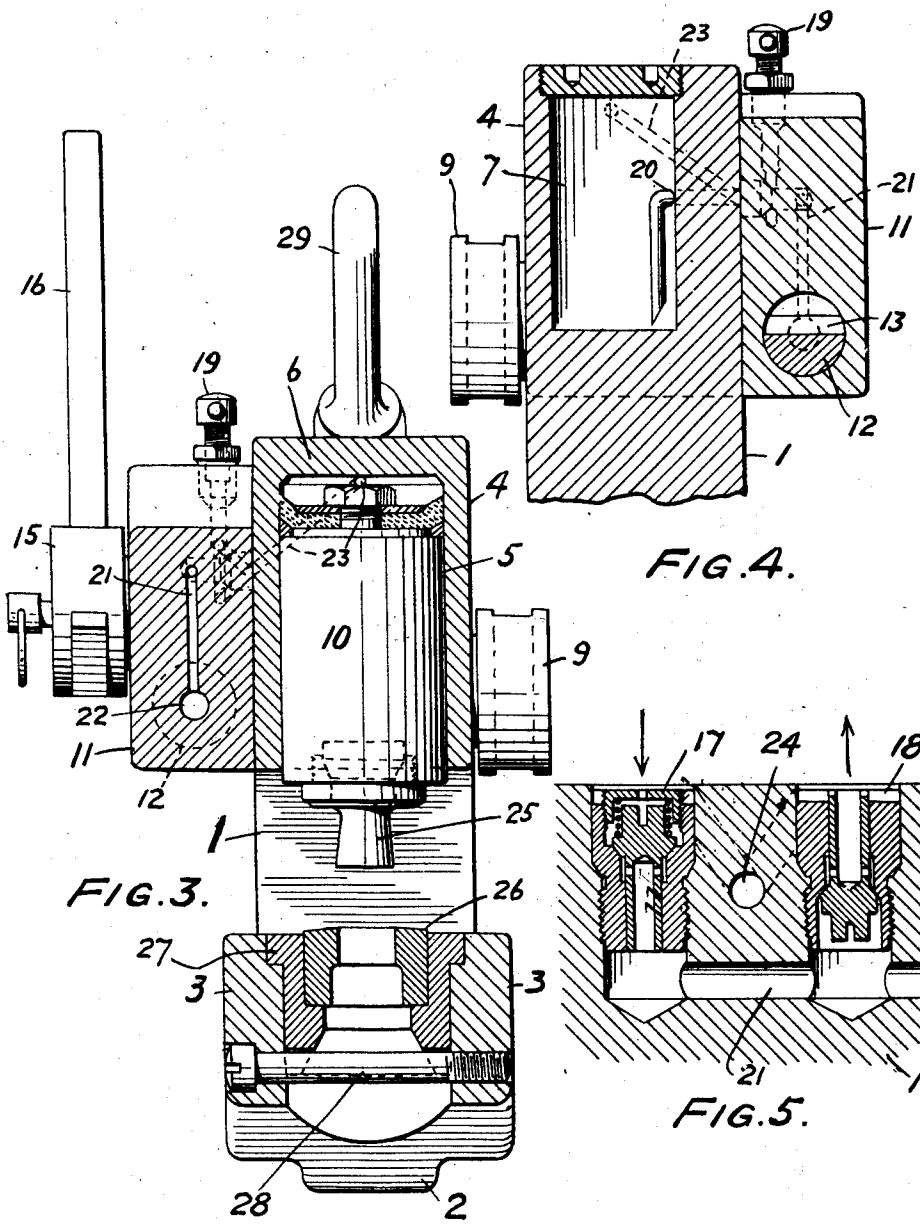
ATTORNEY.

July 3, 1928. 1,675,369

W. MESSINGER

HYDRAULIC PUNCH

Filed Feb. 19, 1927 2 Sheets-Sheet 2



WITNESS:

Robt. R. Mitchell.

INVENTOR

William Messinger

BY

Augustus B. Stoughton.

ATTORNEY.

Patented July 3, 1928. 1,675,369

UNITED STATES PATENT OFFICE.

WILLIAM MESSINGER, OF PHILADELPHIA, PENNSYLVANIA.

HYDRAULIC PUNCH.

Application filed February 19, 1927. Serial No. 169,503.

The principal object of the present invention is to provide a compact, light and portable hydraulic punch adapted for piercing holes in metal, for example, rivet or bolt holes in structural shapes, I beams, channel sections or the like erected in structures, as elevator shafts, and not accessible for fabrication by shop machinery.

It may be said descriptively and not by way of limitation that a hydraulic punch about to be described and embodying features of the invention is about 9″ by 9″ by 6″ in size, weighs about forty-five pounds and is of about fifty tons capacity.

The invention will be claimed at the end hereof but will be first described in connection with the embodiment of it chosen for illustration in the accompanying drawings forming part hereof and in which

Figure 1 is a side elevation with parts broken away.

Fig. 2 is a top or plan view with parts broken away.

Fig. 3 is a sectional view taken generally on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 2, and

Fig. 5 is an enlarged sectional plan view of parts shown in Fig. 2.

In the drawings 1 is a generally C-shaped frame having at the end of its lower arm 2 a claw 3 and having in the end of its upper arm 4 a cylinder space 5 aligned with the claw and having its head 6 integral with the upper arm. It may be remarked that the cylinder or cylinder space 5 provides a length of stroke exceeding the distance between the arms 2 and 4. The upper arm 4 has within it a reservoir 7. 8 is a toothed wheel arranged in a cavity in the upper arm 4 for rotation, and this wheel 8 is provided with a head 9 adapted to be turned, for example, by means of a hand bar. 10 is a ram arranged in the cylinder 5 and it is introduced into the cylinder through the opening provided by the claw 3. In this way the ram can be introduced into the cylinder although the latter is provided with an integral head 6, as has been stated, and the fact that the head 6 is integral, as is also the cylindrical wall of the cylinder with the structure of the arm 4, is important because it enables the hydraulic pressure of the character mentioned to be resisted by the heat treated high strength steel of which the parts are constructed. The ram 10 is provided with rack teeth which mesh with the teeth of the toothed wheel 8, so that the ram can be moved with a quick motion, for example, up to or away from its work. 11 is a pump body applied to the lateral face of the upper arm and it is provided with hand operated pump elements and with relief and other valves. The hand operated pump elements include the plunger 12 having rack teeth 13, meshing with a toothed wheel 14, arranged in a cavity in the body and having a head 15 operable by a hand bar 16. 17 and 18 are the pump intake and outlet valves, and 19 is a relief valve. The fluidways are formed partly in the upper arm 4 and partly in the pump body 11. The fluidway 20 connects with the pump passage 21 of the pump chamber 22 through the outlet valve 18 with the cylinder 5. The fluidways 24 serve through the relief valve 19 to permit free flow of fluid from the cylinder 5 to the reservoir 7. 25 is a punch carried by the ram 10, and 26 is a die mounted in the claw 3, as shown, through the intervention of a collar 27. 28 is a pin detachably arranged across the jaws 3 and in line with the opening of the die 26, and its purpose is to arrest slugs punched from metal by the described hydraulic punch.

In use the hydraulic punch may be transported by the handle 29 and applied to the flange or other like part of a structural shape in practically any location where the same is likely to be assembled in a structure. For example, it can be applied to the beams incorporated in elevator shafts, and this can be done in such a way that the hole can be punched wherever necessary. With the relief valve 19 open, the punch can be adjusted to its work with a quick movement by turning head 9 by a hand bar or otherwise. The relief valve 19 being closed and the pin 28 being in place, the hand bar 16 is operated to transfer fluid from the reservoir 7 to the top of the ram 10, and to build up in the cylinder 5 hydraulic pressure sufficient to drive the punch through the flange or other like part of a structural shape of steel. The pin 28 serves to check the slug which escapes from the metal of the structural shape with such violence that unless checked it might cause injury.

It will be obvious to those skilled in the art to which the invention relates that modifications may be made in details of con-

struction and arrangement and in matters of mere form without departing from the spirit of the invention which is not limited to such matters or otherwise than the prior art and the appended claims may require.

I claim:

A hydraulic punch comprising a generally C-shaped frame having at the end of its lower arm a claw and having in the end of its upper arm a cylinder space aligned with the claw and having its head integral with the upper arm, said cylinder space providing a length of stroke exceeding the distance between the arms and said upper arm having within it a reservoir and a toothed wheel hand operated mechanism, a ram arranged in the cylinder space and introducible therein through the opening provided by the claw, said ram having rack teeth engaging the hand operated mechanism for quick motion, a pump body applied to the lateral face of the upper arm and provided with hand operated pump elements and relief and other valves, and fluidways provided in the body and in the upper arm.

WILLIAM MESSINGER.