Dec. 6, 1938. A. F. MACCONOCHIE 2,139,639

PORTABLE HYDRAULIC RIVETER

Filed March 4, 1937 2 Sheets-Sheet 1

Fig. 1

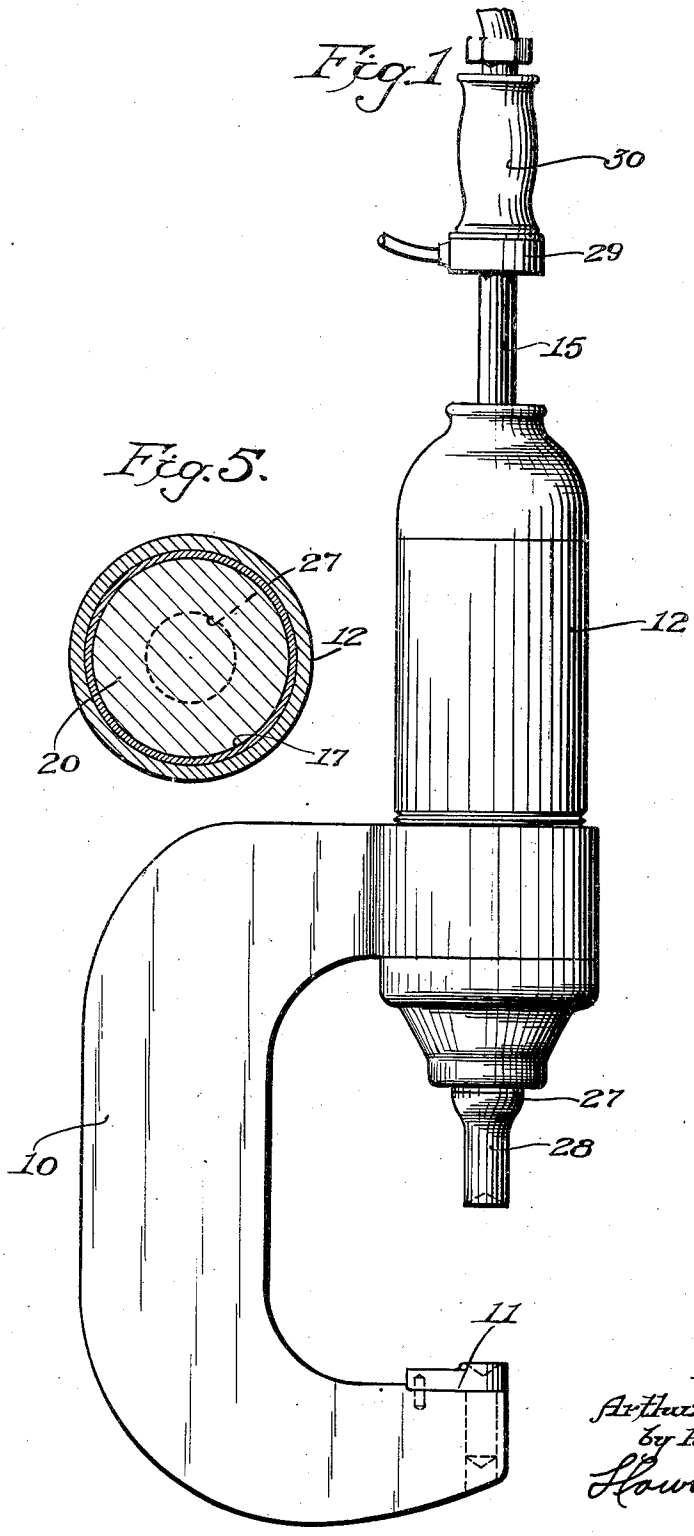


Fig. 5.

Inventor:—
Arthur F. Macconochie
by his Attorneys
Howson & Howson

Dec. 6, 1938. A. F. MACCONOCHIE 2,139,639

PORTABLE HYDRAULIC RIVETER

Filed March 4, 1937 2 Sheets-Sheet 2

Fig. 2.

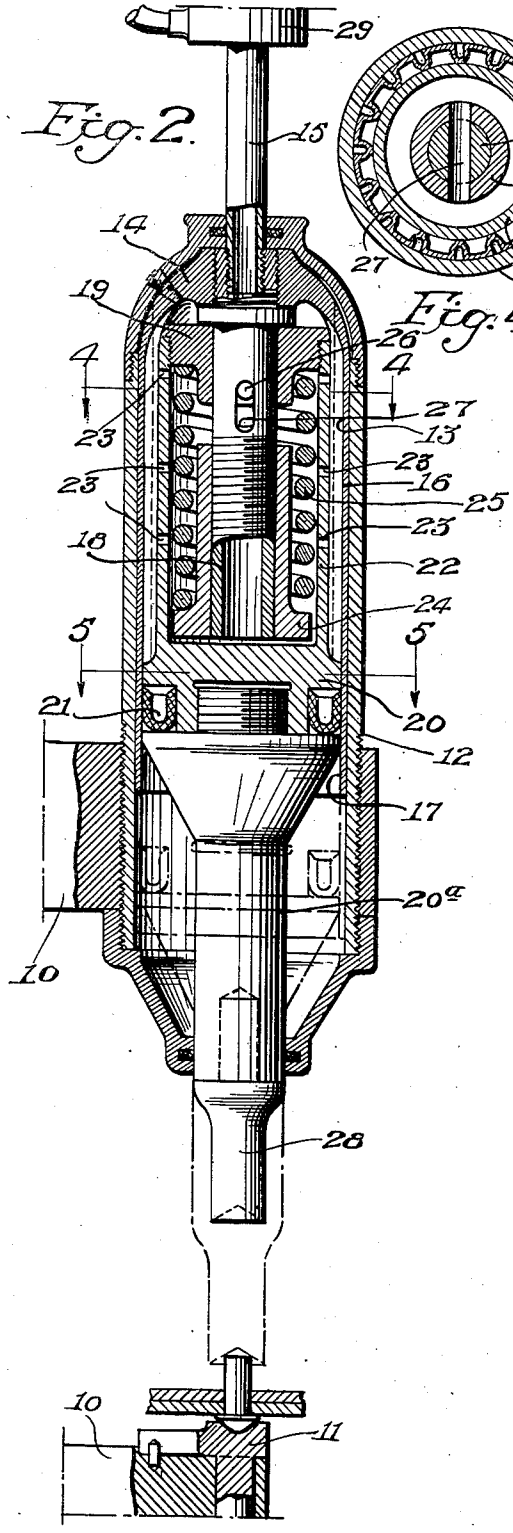
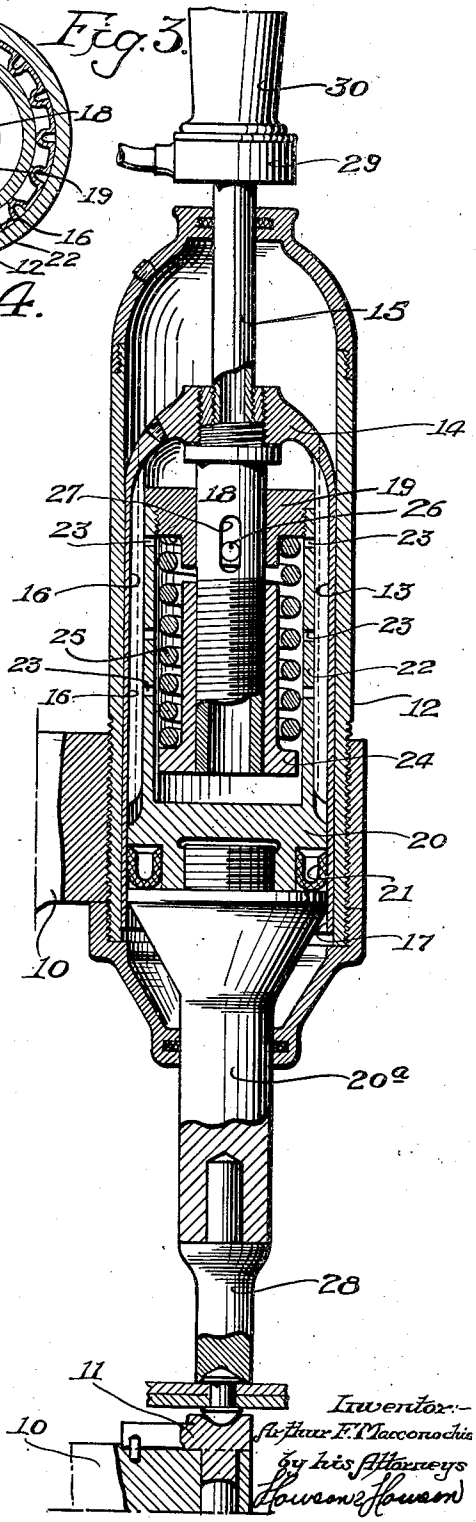


Fig. 4.

Fig. 3.



Inventor:-
Arthur F. Macconochie
by his Attorneys
Howson & Howson

Patented Dec. 6, 1938 2,139,639

UNITED STATES PATENT OFFICE

2,139,639

PORTABLE HYDRAULIC RIVETER

Arthur F. Macconochie, Charlottesville, Va., assignor to Chambersburg Engineering Company, Chambersburg, Pa., a corporation of Pennsylvania

Application March 4, 1937, Serial No. 129,053

4 Claims. (Cl. 78—52)

This invention relates to portable hydraulic riveters, and has for an important object thereof the speeding of the operation of this type of machine.

As is well known to those familiar with the art, such machines usually include a crane-type hook, one jaw of which bears a die for the rivet head, and the other jaw of which bears a hydraulic cylinder carrying the opposing die for contact with the tail of the rivet. Very often such rivets are so located that the space between the dies during the application of the machine to the rivet must be made considerable and the usual practice is to employ low pressure fluid to take up the space between the rivet and the dies and then to apply high pressure fluid. This requires, in addition to the multiple-way valve essential in handling high and low pressures and the provision of sources of such pressures, a considerable time in manipulation, for the movement of a hydraulic ram is relatively slow.

An important object of this invention is the provision of means whereby a device of this character may be operated from a single source of pressure and the closure effected manually.

A further and more specific object of the invention is the provision in an apparatus of this character of a hydraulic cylinder which is bodily movable with relation to the hook and is secured in its adjusted positions by the introduction of fluid pressure thereto.

These and other objects I attain by the construction shown in the accompanying drawings wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a side elevation of a riveting machine constructed in accordance with my invention;

Fig. 2 is a fragmentary longitudinal sectional view therethrough illustrating in dotted lines the adjustment of the cylinder to bring the piston-borne die thereof into engagement with the rivet;

Fig. 3 is a similar sectional view showing the structure after the riveting stroke;

Fig. 4 is a section on line 4—4 of Fig. 2; and

Fig. 5 is a section on line 5—5 of Fig. 2.

Referring now more particularly to the drawings, the numeral 10 generally designates the usual crane-type hook bearing upon one jaw thereof a die 11 for engagement with the head of the rivet. Mounted in the other jaw of the hook is a cylindrical casing 12 within which is disposed a cylinder 13. The cylinder 13 is divided into three main body portions, a head 14 which is secured to an operating stem 15 which likewise serves as a means to admit fluid pressure to the cylinder; an intermediate body portion 16 which is longitudinally corrugated and, accordingly, circumferentially expansible under the influence of internal pressure; and a skirt or true cylinder portion 17. Extending axially inwardly from the head is an internal prolongation 18 of stem 15 and of the fluid conduit.

Slidably mounted upon this prolongation of the stem is a piston element which may again be divided into a head 19 slidably engaging the interior of the corrugated portion 16 of the cylinder; a true piston 20 slidably mounted in the true cylindrical portion 17 of the cylinder and packed thereto at 21; and a skirt 22 connecting the head 19 and piston 20 and likewise slidably engaging the corrugated intermediate wall 16 of the cylinder, this skirt being perforated at 23 to permit the passage of fluid pressure therethrough. Between the nut 24 carried by the inner end of the extension 18 and the head 19 of the piston a pull-back spring 25 is arranged and head 19 is keyed against rotation with relation to the extension as by means of set screw 26 operating in a slot 27 in the wall of the extension.

The piston is equipped with an elongated stem 20a projecting through the inner end of casing 12 and equipped with the closing-in die 28. Cylinder 13 is, in the absence of internal pressure, free to move longitudinally in casing 12, and it will be obvious that after the hook has been placed about the work and die 11 is engaged with the head of the rivet, pressure applied to the stem 15 will cause the cylinder to slide in the casing and bring the closing die 28 against the tail of the rivet. Fluid pressure is then admitted from a suitable source which may be conveniently controlled through a rotary switch 29 actuated through an operating handle 30 carried by stem 15, this switch in turn controlling the solenoid valve or the like actually directly controlling the supply of liquid. The pressure admitted to the cylinder and acting against the corrugated wall 16 through the openings 23 causes this corrugated wall to expand and come into frictional engagement with the inner wall of casing 12 holding the cylinder against movement following which movement of the ram or piston 20 against the action of spring 25 will begin and continue until the rivet is fully headed by die 28. Upon release of the pressure in the cylinder, the same may be readily withdrawn to its normal position to be ready for another operation.

Since the construction illustrated is obviously capable of considerable modification without departing from the spirit of my invention, I do not wish to be understood as limiting myself to the herein described form except as hereinafter claimed.

I claim:

1. In a device of the type described, a support, a die mounted in the support, a cylinder guided in the support and bodily movable toward and away from said die, a piston in the cylinder and supporting a die for co-action with the first-named die, and means operated by introduction of fluid pressure to the cylinder for locking the cylinder in adjusted positions in the support.

2. In a device of the type described, a support, a die mounted in the support, a cylinder guided in the support and movable toward and away from said die, a piston in the cylinder and supporting a die for co-action with the first-named die, the cylinder comprising an expansible wall section expanding under influence of fluid pressure admitted to said cylinder and frictionally engaging the support to lock the cylinder against movement.

3. In a device of the type described, a support, a die mounted in the support, a member guided in the support and movable toward and away from said die, a piston mounted within said member, hydraulic means for moving said piston toward said die, manual means for moving said member, and means operative upon admission of pressure to the hydraulic means for rendering the manually movable means inoperative.

4. In a device of the type described, a support, a die mounted in the support, a cylinder guided in the support and bodily movable toward and away from said die, a piston in the cylinder and supporting a die for co-action with the first-named die, a spring normally maintaining the piston in one position in the cylinder, and means operated by introduction of fluid pressure to the cylinder for locking the cylinder in adjusted positions in said support.

ARTHUR F. MACCONOCHIE.