

B. P. COHEN.
PNEUMATIC AND HYDRAULIC CLAMP.
APPLICATION FILED NOV. 1, 1919.

1,400,801.

Patented Dec. 20, 1921.
2 SHEETS—SHEET 1.

Fig. 1.

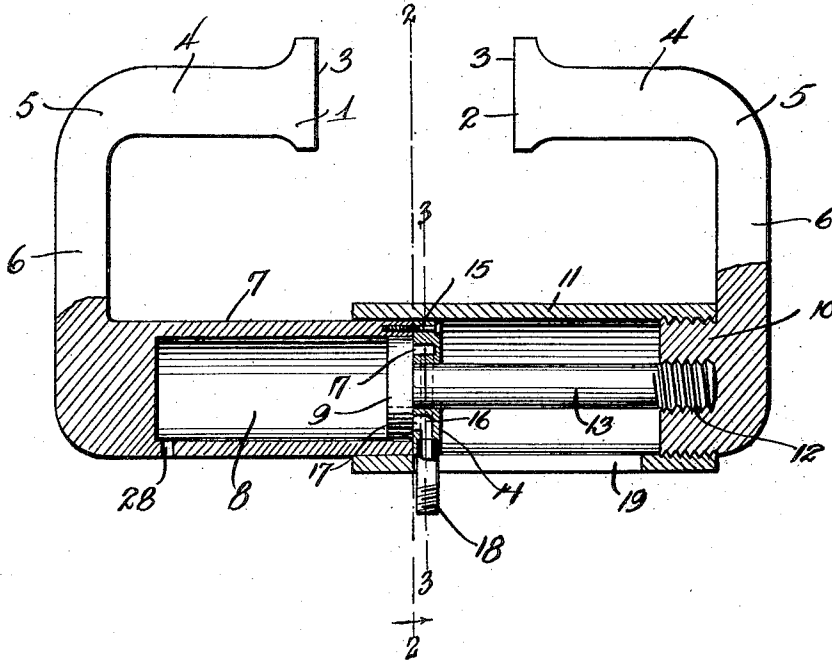


Fig. 2.

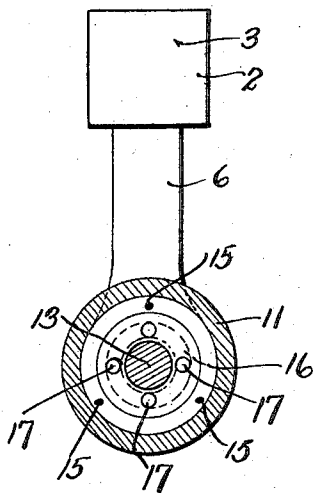
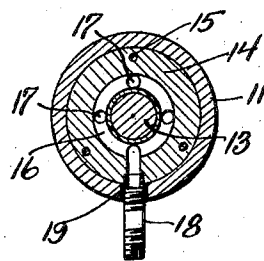


Fig. 3.



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Fig. 4.

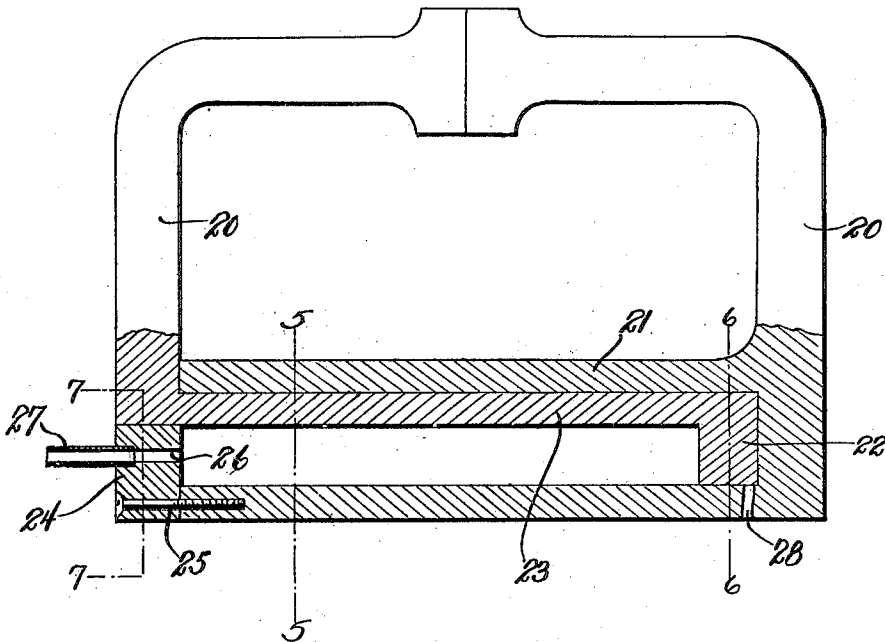


Fig. 5.

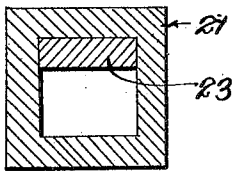


Fig. 6.

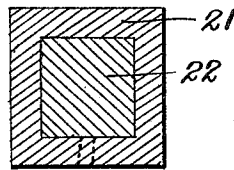
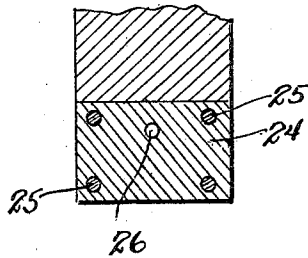


Fig. 7.



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UNITED STATES PATENT OFFICE.

BENJAMIN P. COHEN, OF AUGUSTA, GEORGIA.

PNEUMATIC AND HYDRAULIC CLAMP.

1,400,801.

Specification of Letters Patent.

Patented Dec. 20, 1921.

Application filed November 1, 1919. Serial No. 334,956.

To all whom it may concern:

Be it known that I, BENJAMIN P. COHEN, a citizen of the United States, residing at Augusta, Georgia, have invented new and useful Improvements in Pneumatic and Hydraulic Clamps, of which the following is a specification.

This invention relates to clamps and more particularly to a pneumatic and hydraulic clamp adapted for gripping and holding work in a vise like manner similar to the operation of ordinary bench vises.

The primary object of the invention is to provide a clamp, which may, if found desirable, be used as a vise and which will include clamping elements operable by pressure of either air or liquid.

Another object of the invention is to provide a structure having compartments for the reception of either air or liquid, through which compartments is movable an actuating head engaged by the air or liquid to impart the necessary movement to the clamping or gripping elements.

The invention further aims to provide a structure which will be simple in construction, easily operated, durable and well adapted to withstand the rough usage to which devices of this character are ordinarily subjected.

In the drawings:

Figure 1 is a longitudinal section, partly in elevation, showing the device in open position.

Fig. 2 is a cross-section taken on the line 2—2 of Fig. 1.

Fig. 3 is a cross-section taken on the line 3—3 of Fig. 1.

Fig. 4 is a longitudinal section, partly in elevation, and showing a modified form of the invention, the jaws being in closed position.

Fig. 5 is a cross-section taken on the line 5—5 of Fig. 4.

Fig. 6 is a cross-section taken on the line 6—6 of Fig. 4.

Fig. 7 is a cross-section taken on the line 7—7 of Fig. 4.

In the embodiment of the invention, illustrated in Figs. 1, 2 and 3, the gripping jaws 1 and 2 have their adjacent faces 3 in position to engage each other when the jaws are closed, and so that a piece of work may be engaged and held by the jaw. An arm 4 carries each jaw and as shown in Fig. 1 each arm is shaped to form a right angular elbow

5 thus providing the parallel portions 6 of the arm for the purpose of supporting the jaws at the desired positions. Obviously the portions 6 may be of any length.

Integrally formed with one of the portions 6 is a cylindrical member 7 having a cylindrical compartment 8 formed therein. This compartment provides a cylinder for the reception of a piston 9 longitudinally movable therethrough.

The other arm of the clamp has its portions 6 equipped with a stud 10 exteriorly threaded to receive the screw threaded end of a cylindrical sleeve 11, the opposite end of which embraces one end of the member 7 so that when the jaws are reciprocated the member 7 will slide within the sleeve 11. The stud 10 has a central screw threaded recess 12 which receives one end of a piston rod 13, the latter projecting centrally through the sleeve 11 and joined or integrally formed with the piston 9.

The open end of the piston cylinder 8 is closed by a removable plate 14. This plate is circular in form and is secured to the end of the member 7 by suitable fastening elements 15. An annular passage way 16 is formed in the plate 14 and axially extending ports 17 which open on one face of the plate and communicate with the annular passage way 16. A removable nipple 18 is carried by the plate 14 and projects through a longitudinal slot 19 in the sleeve 11 whereby the nipple may be joined to a pipe or hose connected to a suitable source of air or liquid supply. The slot 19 permits movement of the connected parts when the device is actuated.

In operation, the air or liquid will be passed through the nipple 18 and into the annular passage 16 and then through the ports 17 so that a pressure will be exerted on the piston 9. This will force the piston through the cylinder 8 and since one of the jaws is connected to the piston rod 13 it will be obvious that the two clamping jaws will be moved toward each other. The sleeve 11 moves on the exterior of the member 7 to properly support the moving jaw.

The modified form shown in Figs. 4, 5, 6 and 7 is operated in a similar manner. Each jaw has an arm 20 and one arm is equipped with a sleeve 21 which may be either square or circular in cross-section. A piston 22 is movable through the sleeve and is joined to the member 23 acting as a piston rod, and

- joining the piston 22 to the other member 20. The open end of the sleeve is closed by a removable block 24 held in position by suitable fastening elements indicated at 25.
- 5 A passage way in the block is shown at 26 and communicates with a connecting nipple 27 which is disposed to receive a pipe or tube whereby air or liquid may be supplied to the cylinder.
- 10 This form operates in the same manner as the above described form and each of the clamps may be released by releasing the pressure of air or liquid. As indicated at 28 in both forms, an outlet opening is
- 15 provided to permit the escape of air from the cylinder when the piston is moved inwardly and to prevent the formation of a vacuum in the cylinder when the piston is moved outwardly.
- 20 Air, water, gas or oil may be employed in operating the device and the jaws may be held firmly together or tightly clamped against the article between the jaws, until such time as the pressure is released.
- 25 Enough gas or liquid will escape when the pressure is released to permit the jaws to be readily opened.

What I claim is:

1. A clamp of the character specified comprising opposed jaws having adjustable telescopic sections, one of said sections comprising a cylinder and the other constituting piston means operable in the cylinder for extending or contracting the jaws, said piston means including a steadying member having a slidable bearing against the wall of the cylinder and movable longitudinally thereof as the jaws are adjusted.
- 30 2. A clamp comprising opposed jaws, a cylinder carried by one of said jaws, a

sleeve detachably carried by the other of said jaws and embracing said cylinder, a plate fixed to one end of said cylinder, said plate having a passage-way formed therein open to one face thereof and to its periphery, a piston movable within said cylinder, a piston rod carried by said piston extending through said plate, means detachably connecting said piston rod and one of said jaws, and means to introduce a pressure through said passage-way and hence to said cylinder substantially described.

3. A clamp comprising opposed jaws, a cylinder attached to one of the jaws, a sleeve embracing the cylinder and carried by the second jaw, a plate having a passage way formed therein and in communication with one of its faces, said plate being fixed to one end of the cylinder, and a piston movable through the cylinder and equipped with a piston rod extending through the plate and joined to the said second jaw.

4. A clamp comprising opposed jaws, a cylinder attached to one of the jaws, a sleeve embracing the cylinder and carried by the second jaw, a plate having a passage way formed therein and in communication with one of its faces, said plate being fixed to one end of the cylinder, and a piston movable through the cylinder and equipped with a piston rod extending through the plate and joined to the said second jaw, the said sleeve having a slot, a means to supply a pressure to the passage way in the plate and including a fixed nipple carried by the plate and projecting through the slot.

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Witnesses:

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BEN. HERRMAN.