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1,479,712

F. N. HALLETT

BOLTING UP MACHINE

Filed May 6, 1922

2 Sheets-Sheet 1

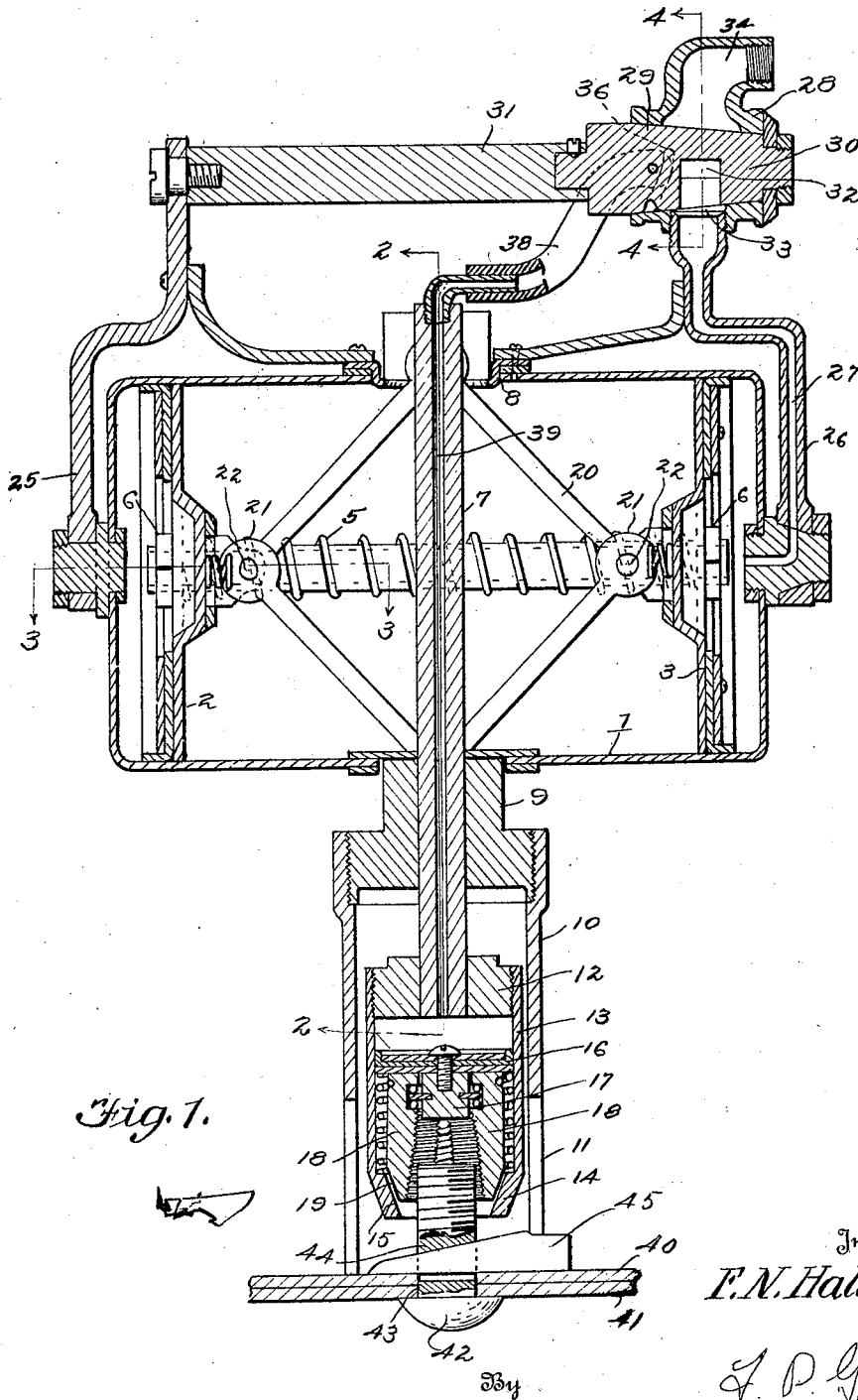


Fig. 1.

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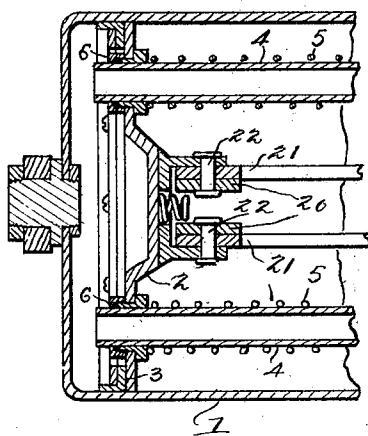


Fig. 3.

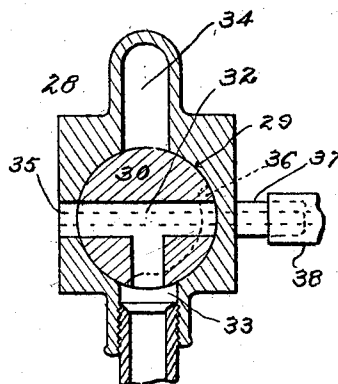
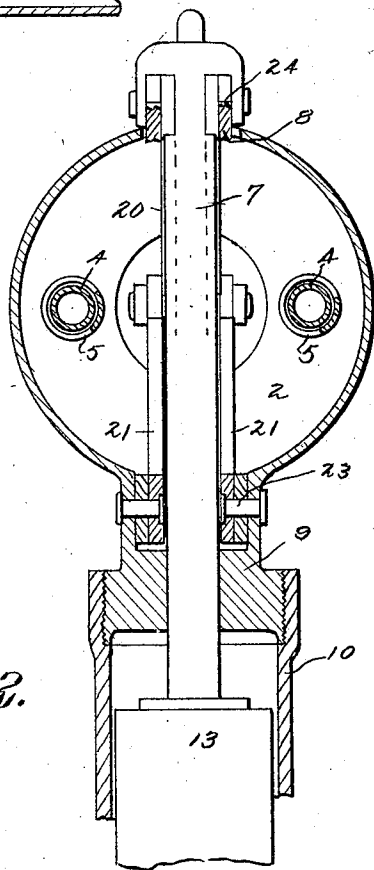


Fig. 4.

Fig. 2.



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UNITED STATES PATENT OFFICE.

FRED N. HALLETT, OF SEATTLE, WASHINGTON, ASSIGNOR TO THE CONSTRUCTION APPLIANCE CO., A CORPORATION OF WASHINGTON.

BOLTING-UP MACHINE.

Application filed May 6, 1922. Serial No. 552,890.

To all whom it may concern:

Be it known that FRED N. HALLETT, a citizen of the United States of America, residing at Seattle, in the county of King and State of Washington, has invented certain new and useful Improvements in Bolt-
ing-Up Machines, of which the following is a specification.

This invention relates to improvements in bolting-up machines, through the use of which, plates or the like to be afterward permanently secured together, are drawn tightly in contact and temporarily held in such relation to provide for convenient permanent connection.

The present machine is to be operated by air pressure and includes generally a clutch member, which when operated under air pressure, effectively grips the temporary holding bolt, this clutch being subsequently operated by air pressure to exert a pull upon the bolt while holding the plates through which the bolts pass against movement.

The invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical sectional view through the improved machine.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 1.

The improved machine comprises a cylinder 1, having opposed pistons 2 and 3, slidably mounted therein and having the usual sealing relation with the wall of the cylinder. These pistons are slidably mounted on hollow tubes 4, which open to the cylinder beyond the respective pistons, and on which tubes between the pistons are arranged coil springs 5, normally acting to force the pistons at their relatively outward limits of movement determined by stops 6 on the rods or tubes. A pull rod 7 is slidably through an opening 8 centrally of the wall of the cylinder, this rod extending through and being slidably mounted in a guide block 9 secured to the exterior of the cylinder diametrically opposite the opening 8. A cylindrical bearing member 10 is removably secured to block 9 and is diametrically slotted at 11 at its remote or free end.

To that end of the pull rod within the bearing member 10, is secured a head 12, to which is threadedly secured, a sleeve-like extension 13, the remote or free end of which is enlarged at 14 and presents, on the

inner surface at least, a downwardly convergent operating surface 15. A piston 16 fits within the extension 13, having sealed sliding connection therewith, and to this piston is secured a block 17 having the usual movable clutch jaws 18 carried thereby. The lower outer surfaces of these jaws are inclined at 19, which inclined surfaces are designed to cooperate with the convergent operating surface of the sleeve member 13 in the operative movement of the jaws, to thereby clamp the jaws upon an object placed within them in the operation of the parts. Duplicate sets of toggle levers 20 are arranged within the cylinder 1, two opposed pivotal points 21 of these sets of levers being secured by appropriate means 22 to the inner surfaces of the pistons 2 and 3, the lower pivotal points of the respective sets of toggle levers being secured at 23 to the guide block 9, while the upper sets of pivotal points are secured at 24 to the pull rod 7. Bracket arms 25, 26, are connected to the respective ends of the cylinder 1, the latter having an interior channel 27 opening into the cylinder at one end thereof for the admission of air under pressure to the cylinder. The bracket 26 is connected at the end remote from the cylinder with a valve casing 28 having a conical valve seat 29 to receive a conical plug valve 30. The valve extends beyond the valve casing and is connected to an operating handle 31, the opposite end of which is rotatably supported in the end of bracket 25, whereby through turning the handle, the valve 30 may be operated. The valve is provided with a T-formed bore 32 and the valve casing has a port 33 communicating with the bore or channel 27 of bracket 26. The valve casing also has an inlet port 34, to which a connection with any suitable source of air under pressure may be made, and also with an exhaust port 35 leading to the atmosphere. The valve is also formed with a surface channel 36, which when the valve is in a predetermined position, will establish communication between inlet 34 and an outlet 37 from the casing. This outlet 37 is connected by a flexible tube 38 with the longitudinal bore or channel 39 of the pull rod 7. It will be noted particularly from Fig. 4 of the drawings, that the surface channel 36 of the valve is so arranged that air inlet may be provided for the pull rod before the main

valve channel 32 is arranged to admit air pressure to the cylinder 1.

With the parts arranged and constructed as described, and assuming that it is desired to temporarily secure the plates indicated at 40, 41, into absolute contact, a bolt 42 is passed through aligned openings 43 in said plates, said bolt having a transverse wedge recess or channel 44 for the reception of a wedge 45. The valve 30 is turned by operation of the handle 31 so as to admit compressed air to and through the pull rod. This air entering the extension 13 above the piston 16, forces the latter downwardly and causes the clutch jaws 18 to grip the bolt, the bearing member 10 resting of course upon the upper plate 40. The valve is then turned until air is admitted from the inlet 34 to the channel 27. This air under pressure passes to the cylinder 1, being admitted in rear of both pistons through the tubes 4. The pistons are caused to move toward each other, and through the toggle lever connection described, the bolt is drawn upwardly, forcing the lower plate into close contact with the upper plate 40. With the parts held in this position, the wedge 45 is driven through the slot in the bolt, and the bolting up machine released by moving the valve to exhaust position. The springs 5 return the parts to normal positions, following the relief of the air pressure.

Claims:

1. A bolting up machine including a cylinder, a pull rod operative therethrough, pistons in the cylinder connections between the pistons and the pull rod for operating said rod, and gripping means carried by the rod and operated independently of the rod.

2. A bolting up machine including a cylinder, a pull rod operative therethrough, pistons in the cylinder for operating said rod, and gripping means carried by the rod and operated by air pressure independently of the piston.

3. A bolting up machine comprising a cylinder, opposed pistons therein, a pull rod movable through the cylinder, a gripping means carried by the pull rod, and a valve for independently controlling pressure admission to the cylinder and through the pull rod to the gripping means.

4. In a bolting up machine, a cylinder, pistons operative therein, a pull rod opera-

tive through the cylinder, toggle lever connections between the pistons, pull rod and cylinder to operate the pull rod in the movement of the pistons, gripping means supported by the pull rod, and means responsive to air pressure for operating the gripping means.

5. In a bolting up machine, a cylinder, pistons operative therein, a pull rod operative through the cylinder, toggle lever connections between the pistons, pull rod and cylinder to operate the pull rod in the movement of the pistons, gripping means supported by the pull rod, means responsive to air pressure for operating the gripping means, and a valve for controlling admission to the gripping means and to the cylinder for operating the pistons.

6. A bolting up machine, including a cylinder, inlet and outlet ports, means for opening and closing said ports one at a time, pistons in the cylinder, a gripping rod, toggle means between the pistons and the gripper rod, and gripping means on the end of the rod, said gripping means being controlled by the opening and closing of said ports.

7. A bolting up machine, including a cylinder, inlet and outlet ports, pistons in the cylinder, a gripper rod, operative connections between the gripper rod and the pistons, gripping means carried by the gripping rod, means for actuating the gripping means, means for opening and closing the said ports one after the other.

8. A bolting up machine, including a cylinder, an inlet port, an outlet port, gripping means, pull means for said gripping means, and connections between said ports for first actuating the gripping means and afterwards actuating the pull means.

9. A bolting up machine, including a cylinder, an inlet port, an outlet port, clutch jaws, a toggle, connections between the inlet port and said clutch jaws, a separate connection between inlet port and the toggle, and means for automatically opening the first mentioned connection and afterwards opening the last mentioned connection, whereby the clutch jaws are actuated before the toggle.

In testimony whereof I affix my signature.

FRED N. HALLETT.