



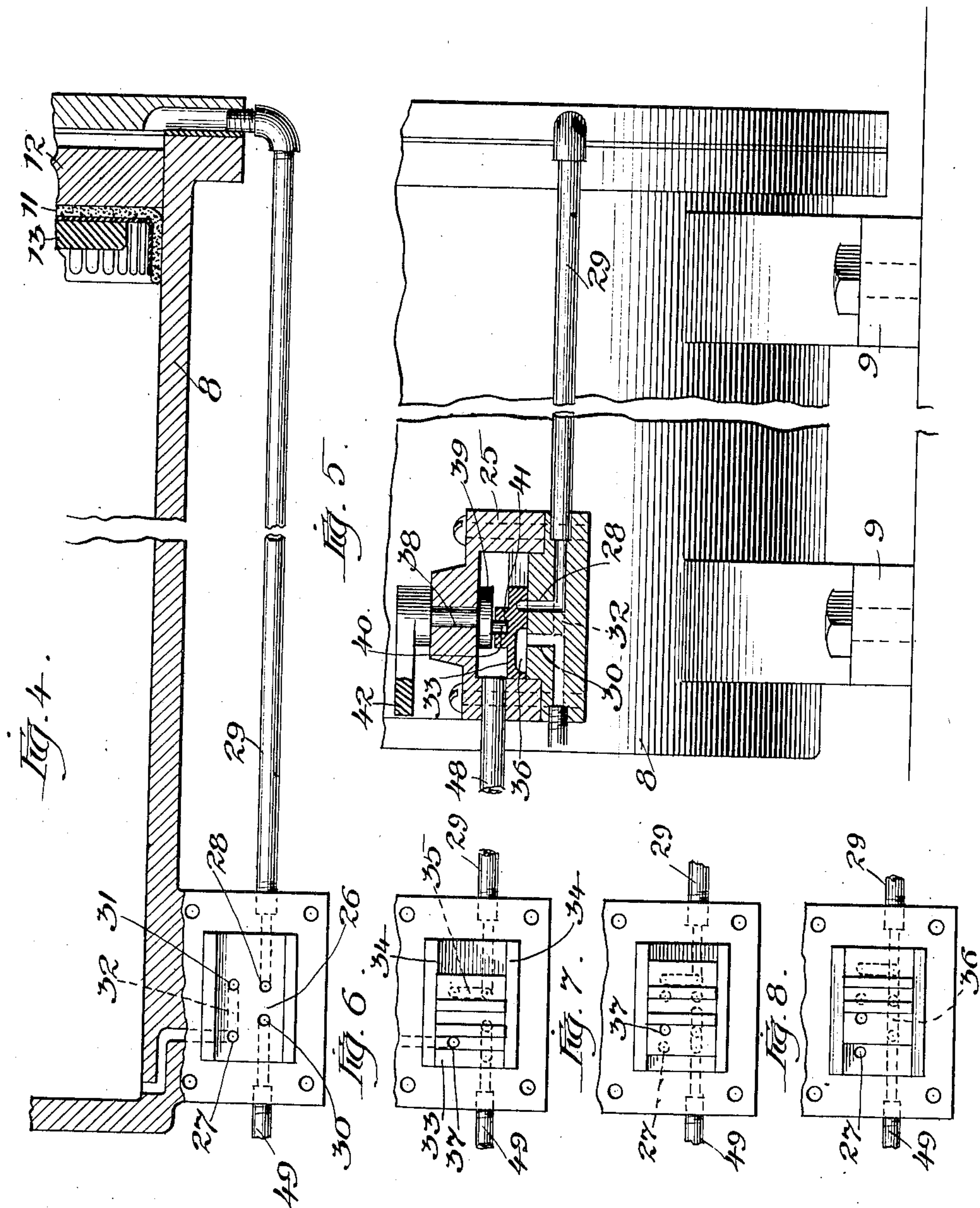
No. 871,816.

PATENTED NOV. 26, 1907

J. E. OSMER.  
VISE.

APPLICATION FILED JUNE 24, 1907.

2 SHEETS—SHEET 2



Witnesses:  
Frank Blanchard  
George L. Chindahl

Inventor:  
John E. Osmer  
By Luther L. Miller  
Attorney.



# UNITED STATES PATENT OFFICE.

JOHN E. OSMER, OF CHICAGO, ILLINOIS.

WISE.

No. 871,816.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed June 24, 1907. Serial No. 380,434.

*To all whom it may concern:*

Be it known that I, JOHN E. OSMER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vises, of which the following is a specification.

One of the objects of this invention is the production of a fluid-pressure-actuated vise comprising a vise structure and a motor structure which are readily separable from each other for convenience of repair.

Another object of the invention is the provision of means for removing filings from the bearings of the mechanism.

The invention also relates to the other improvements in vises hereinafter set forth.

In the accompanying drawings, Figure 1 is a top plan view of a fluid-pressure-actuated vise embodying the features of my invention. Fig. 2 is a view substantially in longitudinal vertical central section. Fig. 3 is a front end elevation of the vise structure. Figs. 4 and 5 are fragmental views showing the valve mechanism. Figs. 6, 7 and 8 are views in a series, showing the different operative positions of the valve mechanism.

The vise structure in the present instance comprises a support 1 provided with a base 2 by means of which the vise structure is secured to a bench *a* or other suitable support. At the upper end of the support 1 is the fixed vise jaw 3. The stem 4 of the movable jaw 5 is slidably mounted in an opening 6 in the support 1, and upon the bracket 7 projecting forwardly from and preferably cast integral with the support 1.

In the present embodiment of the invention, the motor structure comprises a cylinder 8 of suitable construction, said cylinder having lugs 9 for attaching the cylinder to the bench *a* in the rear of the vise structure. The piston rod 10, in this instance, is tubular in construction and has attached to its inner end a piston 11 comprising two disks 12 and 13, the latter having a cylindrical portion 14 filling the rear end of the piston rod. The forward end of the tubular piston rod 10 is closed by a plug 15. The piston 11 and the plug 15 may be secured in place by means of a tie rod 16, the forward end of which is screwed into an opening in the plug 15, said rod passing through registering openings in the disks 12 and 13 and receiving a nut 17 upon its rear screw-threaded end. Suitable packing devices 18 and 19 are provided for

the piston 11 and the piston rod 10. The forward end of the piston rod 10 is secured to the rear end of the stem 4 of the movable vise jaw in any suitable manner, but preferably so that said stem and piston rod may be readily disconnected. I have herein shown perforated ears 20 formed integral with the plug 15 and an ear 21 fixed to the rear end of a rod 22, a bolt 23 extending through said ears. The forward end of the rod 22 is screw-threaded into an opening 24 in the forward end of the stem 4.

The pressure fluid is admitted to the cylinder 8 by means to be now described. A pressure chest 25 is located in any suitable place, as, for example, upon one side of the cylinder 8. The valve face 26 in said pressure chest has a port 27 therein communicating with the forward end of the cylinder 8, a port 28 connected with the rear end of the cylinder through a pipe 29, and an exhaust port 30. A port 31 in said valve face is connected with the port 27 through the passage 32. A slide valve 33 is mounted between guides 34 upon the valve face, and has a cavity 35 therein adapted to connect the ports 28 and 31, and another cavity 36 adapted to connect the ports 28 and 30. An opening 37 extends through the slide valve 33 in position to register with the port 27 when the cavity 35 connects the ports 28 and 31.

The slide valve 33 is reciprocated by any suitable means. I have herein shown a vertical shaft 38 having fixed to its lower end a face plate 39, said face plate carrying a crank pin 40 which lies within a transverse groove 41 formed in the slide valve. A crank arm 42 is fixed to the upper end of the vertical shaft 38 and is connected with an operating rod 43 by means of a link 44. The operating rod 43 is herein shown as slidably mounted in guides 45 fixed to the support 1. Preferably means is provided for releasably locking the slide valve 33 in its three operative positions, such as a sector 46 having locking notches 47 therein adapted to receive the point of a spring-pressed locking plunger (not shown) carried by the crank arm 42.

Pressure fluid is admitted to the pressure chest 25 through a supply pipe 48. In the present embodiment the pressure fluid, such as compressed air, is utilized for blowing filings and the like from the upper side of the stem 4 and the piston rod 10 so that said



filings shall not be carried into the bearings of said stem and piston rod during the operation of the vise. I have herein shown a pipe 49 connected with the exhaust port 30, one branch 50 of said pipe extending to a point above and close to the piston rod 10 and another branch 51 extending to a point above and near the stem 4.

When the vise is closed the slide valve 33 is in the position shown in Fig. 8, the space in the cylinder rearwardly of the piston 11 being connected with the atmosphere through the pipe 29, port 28, cavity 36, port 30, and pipe 49. The space in the cylinder in front of the piston communicates with the source of pressure fluid through the port 27. Pressure is now continually being exerted to hold the vise closed. When the vise is to be opened the slide valve 33 is moved into the position shown in Fig. 6, wherein the ports 28 and 31 are connected through the cavity 35, and the port 37 registers with the port 27. The pressure fluid theretofore used for closing the vise now passes from the space in front of the piston 11 through the port 27, passage 32, port 31, cavity 35, port 28, and pipe 29 to the rear of the piston. The area of the rear side of the piston being greater than the effective area of the forward side thereof, the equalizing of the pressures in both ends of the cylinder causes the piston to be moved to the left (Fig. 2), thus opening the vise. At the same time high-pressure fluid is admitted to the cylinder through the ports 37 and 27.

If it be desired to stop the travel of the vise jaw 5 at a point between the extremities of its movement, the slide valve 33 may be placed in an intermediate position, as indicated in Fig. 7, in which position all of the ports leading to the cylinder are blanked.

The exhaust pressure fluid is discharged through the pipes 50 and 51 onto the piston rod 10 and the stem 4, clearing said piston rod and stem of filings or other material that might injure the bearings for said piston rod and stem.

When desirable, the vise structure and the motor structure may be separated from each other for cleaning or repairing.

It is obvious that various changes may be made in the embodiment herein illustrated

without departing from the spirit and scope of the invention, wherefore I desire to have it understood that I do not limit myself to the precise details herein set forth.

I claim as my invention:

1. In a vise, in combination, a complete motor structure comprising a cylinder, a piston, and a piston rod attached to said piston; a supporting member formed separate from and located forwardly of said motor structure; a stationary jaw on said supporting member; and a movable jaw having a stem slidably mounted in said supporting member, said stem and said piston rod being separably connected together.

2. In a vise, in combination, a vise structure comprising a support; a stationary jaw on said support; a movable jaw having a stem slidably mounted in said support, said stem being of hollow construction; a cylinder; a piston in said cylinder; a piston rod attached to said piston; a rod extending through the stem of said movable vise jaw and attached to the forward end of said stem; a connection between the rear end of said rod and the forward end of said piston rod; and a valve mechanism for said cylinder.

3. In a fluid-pressure-actuated vise, in combination, a vise structure comprising a movable vise jaw having a slidably mounted stem; a motor structure comprising a piston rod; and means for discharging the exhaust pressure fluid upon said stem and said piston rod.

4. In a fluid-pressure-actuated vise, in combination, a cylinder; a piston in said cylinder; a piston rod attached to said piston; a movable vise jaw attached to said piston rod; a pressure chest connected with said cylinder; a valve mechanism in said pressure chest; and an exhaust pipe leading from said pressure chest to a point near said piston rod and to a point near the stem of said vise jaw and adapted to discharge the exhaust pressure fluid upon said rod and said stem.

JOHN E. OSMER.

Witnesses:

L. L. MILLER,

GEORGE L. CHINDAIL.