No. 850,865. PATENTED APR. 16, 1907.

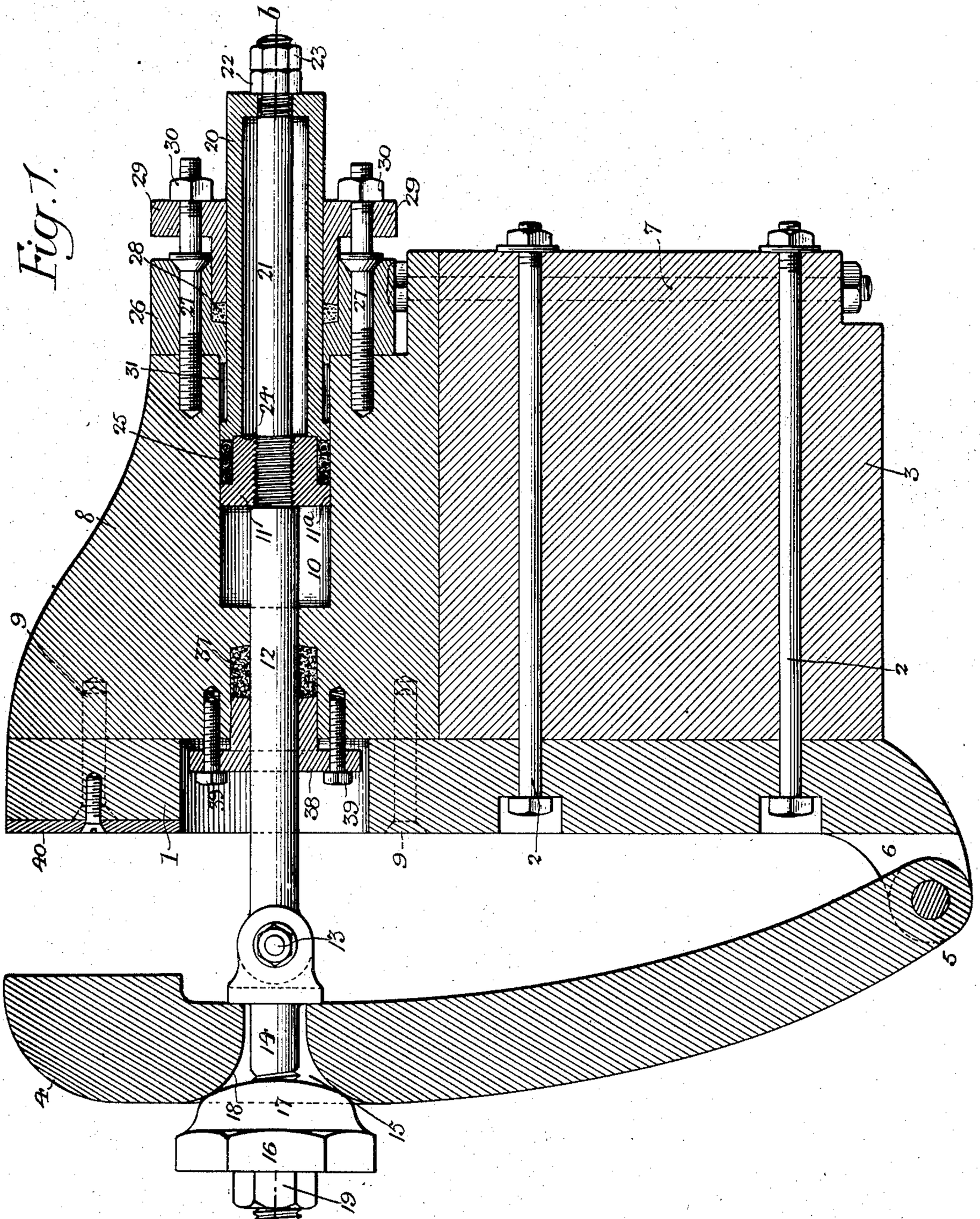
H. DE H. BRIGHT.

HYDRAULIC VISE.

APPLICATION FILED MAY 24, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

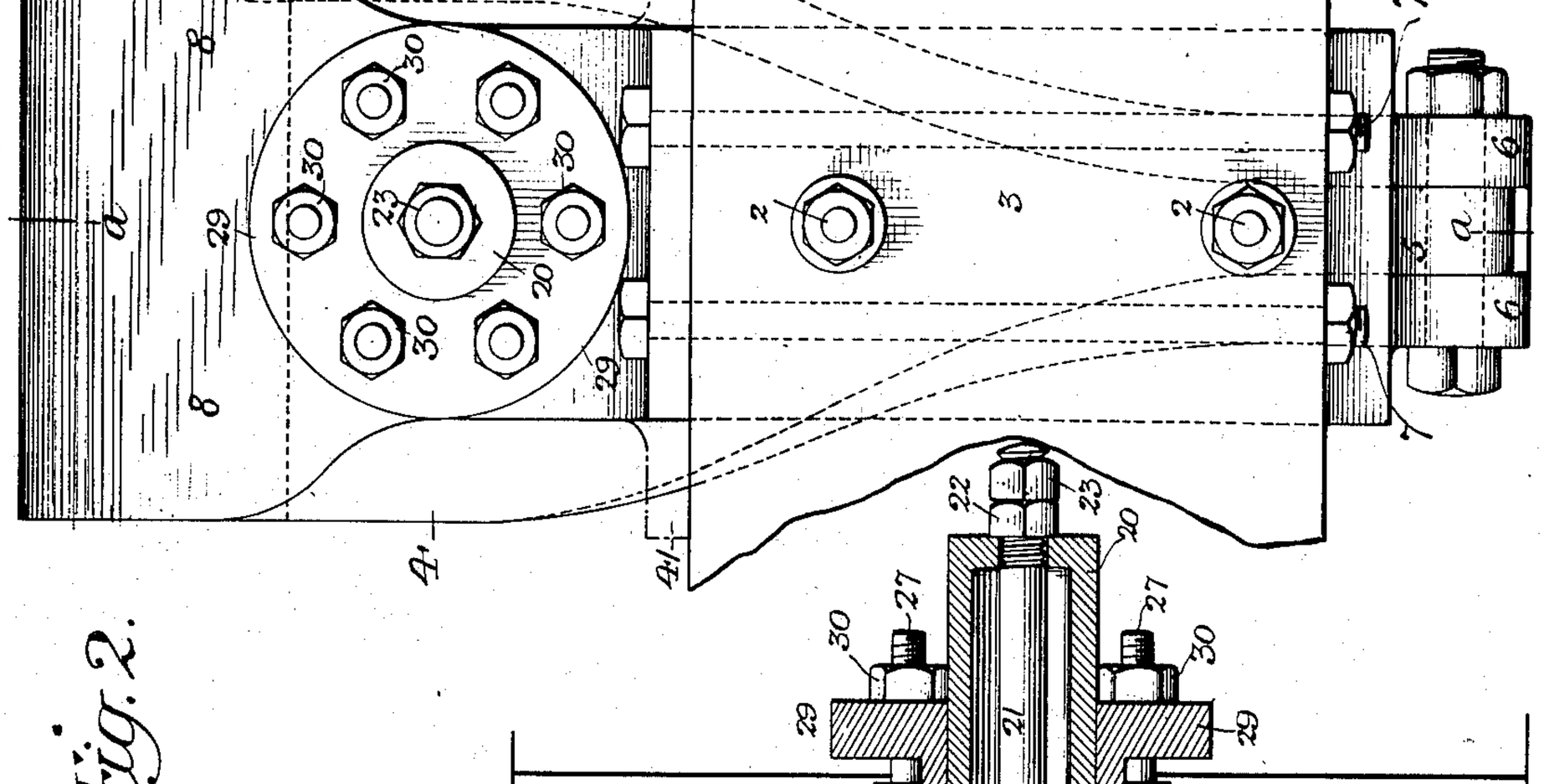
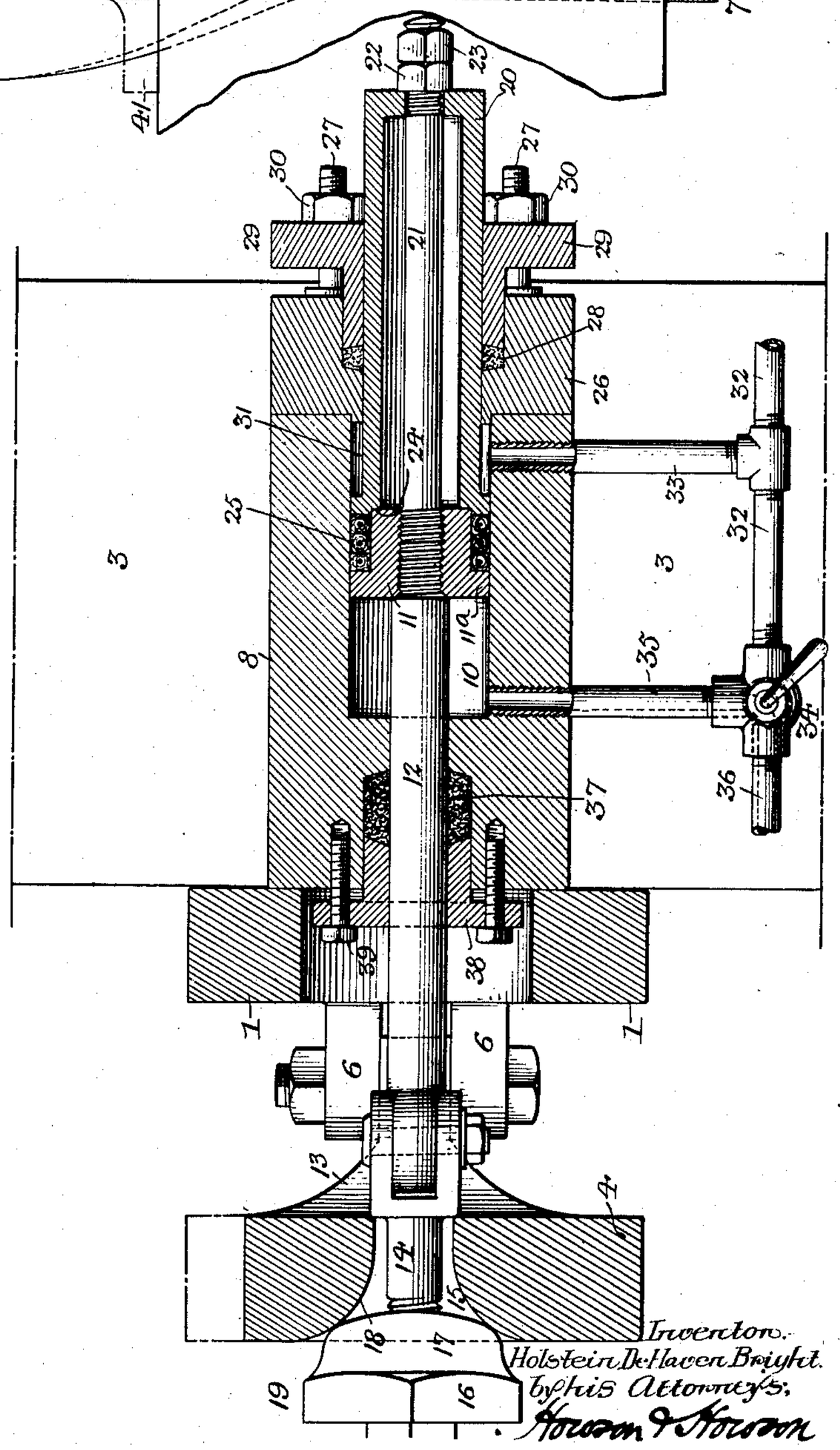


Fig. 3.



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UNITED STATES PATENT OFFICE.

HOLSTEIN DE HAVEN BRIGHT, OF PHILADELPHIA, PENNSYLVANIA.

HYDRAULIC VISE.

No. 850,865. Specification of Letters Patent. Patented April 16, 1907.

Application filed May 24, 1906. Serial No. 318,600.

To all whom it may concern:

Be it known that I, HOLSTEIN DE HAVEN BRIGHT, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Hydraulic Vises, of which the following is a specification.

My invention relates to vises; and it consists of an improved structure designed more particularly for confining the leaves of elliptic springs preparatory to banding the same, or any class of work requiring great holding power and quickness of operation.

My improved vise is operated by fluid-pressure, which is so applied and controlled in operating the structure that pressure is constantly maintained on one side of the piston to hold the jaws of the vise open.

My invention is fully shown in the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved vise, taken on the line *a a*, Fig. 2. Fig. 2 is a rear elevation of the same; and Fig. 3 is a sectional plan view taken on the line *b b*, Fig. 1.

1 represents the fixed jaw of the structure, secured, by means of bolts 2, to a support 3 of any suitable character or fastened directly to a bench. The movable jaw 4 is pivotally connected at 5 to lugs 6, carried by the lower portion of the fixed jaw. Mounted on the support 3 and secured thereto by bolts 7 is a metal block 8, to which the upper portion of the fixed jaw is also connected by means of bolts 9.

The block 8 is recessed at 10 for the reception of a piston 11, carried by a rod 12, pivotally connected at 13 to a stem 14, projecting through an opening 15 in the upper part of the movable jaw. The stem 14 is confined to said jaw by an enlarged nut 16, having a rounded portion 17, fitting the rounded surface 18 of the aperture 15 in said jaw and thereby providing a freely-adjustable connection. The nut 16 is confined to the stem by means of a lock-nut 19.

The piston includes a guiding-stem 20, abutting its head and confined thereto by means of a bolt 21 and nuts 22 and 23. The end of the stem 20 has a shoulder fitting the chamber 10, and this end is recessed at 24 to receive the reduced end of the piston-head. Packing 25 is held between said stem and the flange 11^a of the piston. The stem 20 passes through a collar 26, secured to the block 8 by studs 27, and packing 28 is provided, confined by the usual gland 29, also mounted on the studs 27 and held in place by the usual nuts 30.

At the rear of the piston a contracted chamber 31 is formed between the wall of the cylinder and the stem 20, and within this chamber pressure passing from the main supply-pipe 32 and pipe 33 is constantly maintained, tending to keep the jaws of the vise open. The pipe 32 also communicates with a valve 34, normally cutting off the passage of pressure to pipe 35, leading to the chamber 10, such chamber being normally open to the atmosphere through the pipes 35 and 36, so that there will be nothing to prevent the movement of the piston to the normal position to keep the movable jaw open.

When it is desired to close the jaws of the vise against any object held between the same, pressure is admitted to the pipe 35 by shifting the valve 34, such action closing the passage to the exhaust extension 36 and placing the main supply-pipe 32 in communication with the pipe 35. Full pressure entering the chamber 10 will overcome the constant pressure in the smaller chamber 31 behind the piston, and the latter will be moved to effect the closing of the jaws. To release the jaws, the valve is shifted to the position shown in Fig. 3, whereupon the full pressure will be directed to the rear of the piston and the pressure at the front of the same will be exhausted.

The passage in the block 8 for the piston-rod 12 is also packed, as indicated at 37, and a gland 38, secured by bolts 39 to said block. is employed to hold this packing in place. The fixed jaw of the vise is preferably provided with a wear-plate 40, secured by adjustable screws to said jaw.

The construction forming the subject of my invention is extremely simple and compact. The parts are few, and it can be readily and firmly secured to any suitable support or a work-bench. The operation of the vise is extremely simple, and the shifting of the movable jaw to engage or release the work is very quickly accomplished.

For additional strength and rigidity I may provide ears or lugs 41 at the sides of the block or backing structure 8, as shown by dotted lines, through which lugs bolts may be passed into the support 3.

I claim—

1. The combination, in a hydraulic vise, of a support, a member carried thereby and

forming a fixed jaw, a backing structure mounted on the support immediately behind the member forming the fixed jaw and to which the latter is secured, said backing structure being recessed to form a chamber, a fluid-controlled piston within said chamber, a movable member forming another jaw and hinged to the member forming the fixed jaw, and a connection between said movable member and the piston whereby the vise may be opened and closed by the movement of said piston.

2. The combination, in a hydraulic vise, of a support, a member carried thereby and forming a fixed jaw, a backing structure mounted on the support immediately behind the member forming the fixed jaw and to which the latter is secured, said backing structure being recessed to form a chamber, a fluid-controlled piston within said chamber, a movable member forming another jaw and hinged to the member forming the fixed jaw, a connection between said movable member and the piston whereby the vise may be opened and closed by the movement of said piston, and a guiding-stem at the rear end of said piston.

3. The combination, in a hydraulic vise, of a support, a member carried thereby and forming a fixed jaw, a backing structure mounted on the support immediately behind the member forming the fixed jaw and to which the latter is secured, said backing structure being recessed to form a chamber, a fluid-controlled piston within said chamber, a movable member forming another jaw and hinged to the member forming the fixed jaw, a stem having a freely-adjustable connection with the member forming the movable jaw, and a piston-rod pivotally connected to said stem whereby the vise may be opened and closed by the movement of said piston.

4. The combination, in a hydraulic vise, of a support, a member carried thereby and forming a fixed jaw, a backing structure mounted on the support immediately behind the member forming the fixed jaw and to which the latter is secured, said backing structure being recessed to form a chamber, a fluid-controlled piston within said chamber, a movable member forming another jaw and hinged to the member forming the fixed jaw, a stem having a freely-adjustable connection with the member forming the movable jaw, a piston-rod pivotally connected to said stem whereby the vise may be opened and closed by the movement of said piston, and a guiding-stem at the rear end of said piston.

5. The combination of the fixed jaw of a vise, a block carrying the same, a support for said jaw and its carrying structure, a movable jaw pivotally hung to the fixed jaw and having an adjustable stem, said carrying structure being bored to form a chamber, a piston mounted in said chamber and having a rod connected to the stem of the movable jaw to operate the same, means for applying pressure to move the piston in opposite directions, the pressure on one side of said piston being constant and serving to maintain the vise normally in the open position, and means for controlling and directing said pressure.

6. The combination of the fixed jaw of a vise, a block carrying the same, a support for said jaw and its carrying structure, a movable jaw pivoted to the fixed jaw and having a stem, said carrying structure being bored to form a chamber, a piston mounted in said chamber and having a rod connected to the stem of the movable jaw to operate the same, a guide for the rear end of said piston, stuffing-boxes for the piston-rod and said guide, means for applying pressure to said piston to move the same in opposite directions, the pressure on one side of said piston being constant and serving to maintain the valve normally in the open position, and a valve for controlling and directing said pressure.

7. The combination, in a hydraulic vise, of a member forming a fixed jaw, a movable member forming another jaw pivotally hinged to the fixed jaw and coacting with the latter, and fluid-operated means for opening and closing the vise, said means including a rod connected with the member forming the movable jaw and freely reciprocable through the member forming the fixed jaw, a piston to which said rod is attached, and a guiding-stem at the rear end of said piston.

8. The combination, in a hydraulic vise, of a member suitably supported and forming a fixed jaw, a member pivotally hung from said fixed jaw and forming a movable jaw coacting therewith, fluid-operated means for opening and closing the vise, said means including a rod connected to the movable jaw and freely reciprocable through the fixed jaw, a piston to which said rod is attached, and a guiding-stem at the rear end of said piston, and a stuffing-box carried by the fixed jaw through which said piston-rod passes.

9. The combination, in a hydraulic vise, of a fixed member suitably supported and forming a jaw, a movable member pivotally hung from said fixed jaw and forming another jaw, fluid-operated means for opening and closing the vise, said means including a rod connected to the movable jaw and freely reciprocable through the fixed jaw, a piston to which said rod is attached, and a guiding-stem carried by said piston, said rod connection being close to the engaging faces of said jaws, a backing structure for the fixed jaw having a chamber in which the piston is movable, and a stuffing-box closing the end of said chamber through which the guiding-stem of the piston is reciprocable.

10. The combination, in a hydraulic vise,

of a support, a member forming a fixed jaw secured to said support, a movable member pivotally hung to the said fixed member and forming a jaw coacting therewith, fluid-operated means for opening and closing the vise, said means including a rod flexibly connected to the movable jaw and freely reciprocable through the fixed jaw, a piston to which said rod is attached, a guiding-stem for the rear end of said piston, and a backing member disposed back of the fixed jaw and to which the latter is secured, said backing member having a chamber in which the piston is movable.

11. The combination, in a hydraulic vise, of a fixed jaw, a backing structure to which the same is secured, a jaw hinged to the fixed jaw and coacting therewith, a piston movable within the chamber formed in the backing structure whereby the vise may be opened and closed, a rod leading from said piston to the movable jaw and connected therewith close to the engaging faces of said jaws, the fixed jaw being recessed for the free passage of said rod, means for controlling fluid-pressure to operate said piston, and a guiding-stem for the rear end of the same.

12. The combination, in a hydraulic vise, of a fixed jaw, a support, a backing structure carried by said support, said structure being secured directly to said fixed jaw and bored to form a chamber, a piston within said chamber, a member hinged to the fixed jaw and forming a movable jaw coacting therewith, a connection between said piston and the movable jaw whereby the vise may be opened and closed by the movement of said piston, means for moving said piston, and a guiding-stem at the rear end of the same, said guiding-stem being reciprocable through and closing the rear end of the chamber in which the piston is movable.

13. The combination, in a hydraulic vise, of a fixed jaw, a backing structure secured directly to said jaw and bored to form a chamber, a piston movable within said chamber, a jaw hinged to the fixed jaw and coacting therewith, a stem having a freely-adjustable connection with said hinged jaw, a piston-rod pivotally connected to said stem whereby the movable jaw may be opened and closed by the movement of said piston, means for moving said piston, and a guiding-stem for the same.

14. The combination, in a hydraulic vise, of a support, a fixed jaw carried by said support, a backing structure secured directly to said jaw, said backing structure being also carried by said support and bored to form a chamber, a piston within said chamber, a jaw hinged to the fixed jaw and coacting therewith, a stem adjustably connected to said hinged jaw, a rod attached to the piston and pivotally connected with said stem whereby the movable jaw may be opened and closed by the movement of said piston, means for moving said piston, and a guiding-stem for the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOLSTEIN DE HAVEN BRIGHT.

Witnesses:
MURRAY C. BOYER,
JOS. H. KLEIN.