(No Model.)

G. B. LAMB.

HYDRAULIC PRESSURE VALVE.

No. 490,290. Patented Jan. 24, 1893.

Fig. 1

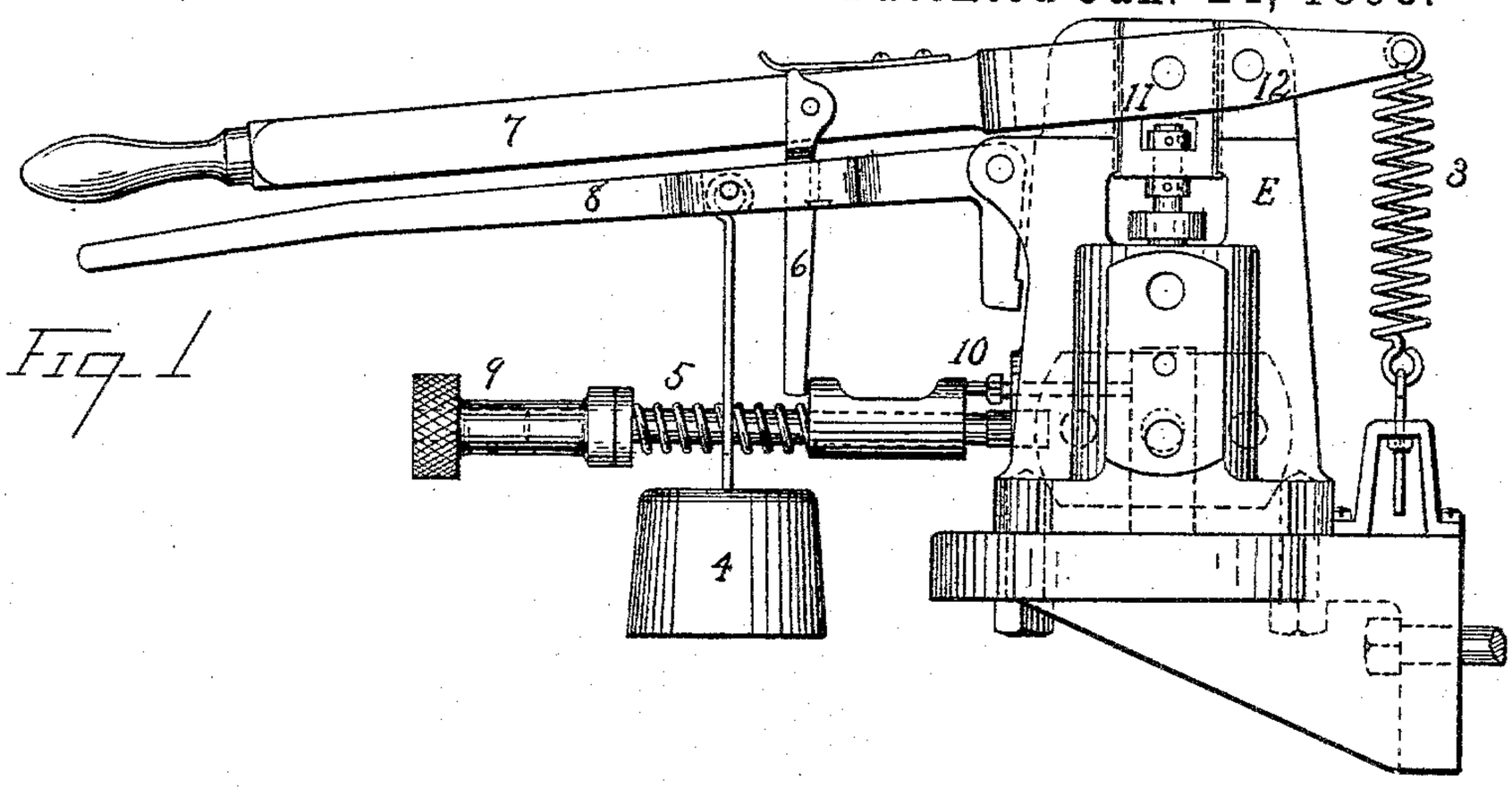


Fig. 2

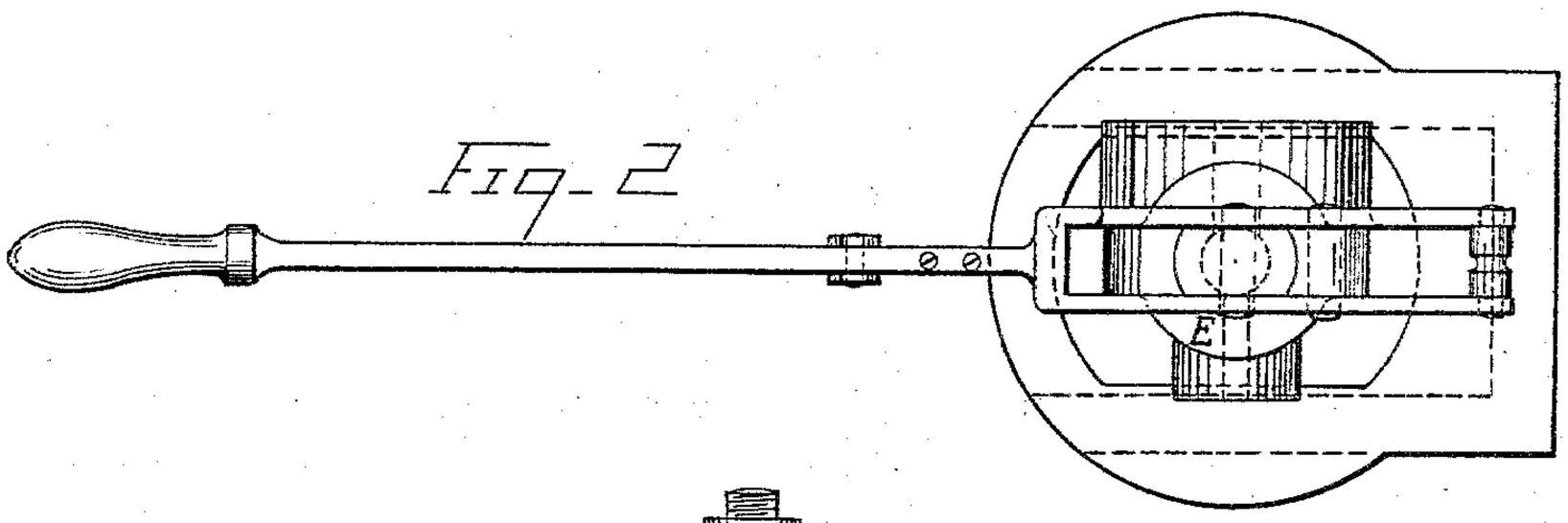
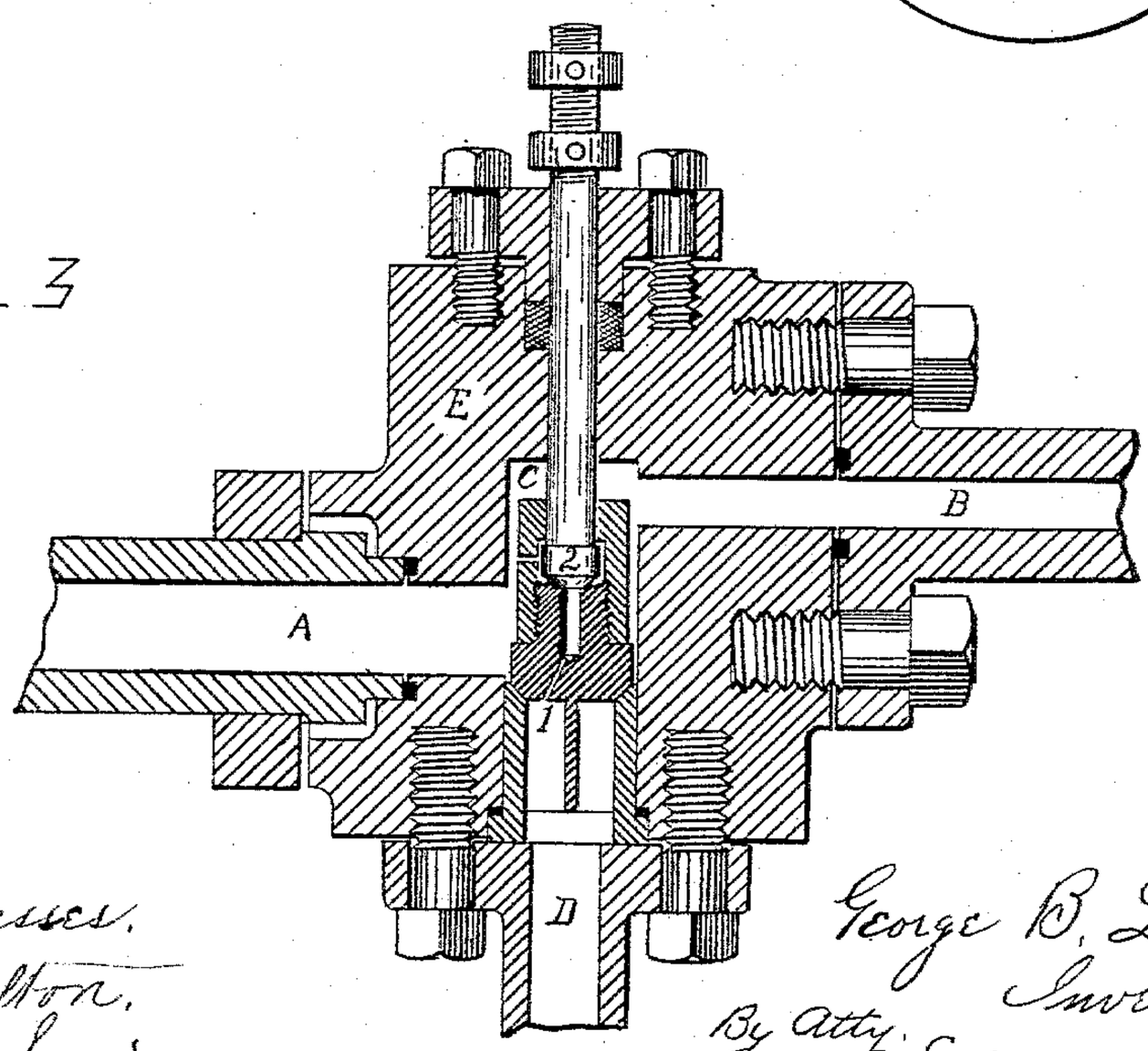


Fig. 3



Witnesses.
W. E. Fulton.
E. C. Lewis

George B. Lamb.
Inventor.
By Atty.
Edward F. Lewis.

UNITED STATES PATENT OFFICE.

GEORGE B. LAMB, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF SAME PLACE.

HYDRAULIC-PRESSURE VALVE.

SPECIFICATION forming part of Letters Patent No. 490,290, dated January 24, 1893.

Application filed January 26, 1892. Serial No. 419,319. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. LAMB, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Hydraulic-Pressure-Release Valve, of which the following is a specification.

My invention relates to improvements in hydraulic press valves in which the pressure is limited by the automatic action of the valve; and the objects of my improvement are, first, to construct a valve which is always an automatic valve, or safety valve, for a certain limiting pressure determined upon, but which may be operated by hand or automatically, for any pressure within that limit; second, to afford facilities for adjusting the valve to act automatically at any desired pressure; third, to provide a means of releasing the pressure gradually, to any desired amount., and from that point, drawing off the water rapidly, preparatory to another stroke of the press; fourth, to reduce the number of parts, and so combine them, that the whole action of the valve is under the control of one lever., thus avoiding the possibility of the operator becoming puzzled and making a mistake, as might be the case if there were two or more levers to handle. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a view looking on the top of Fig. 1; Fig. 3, a vertical central section, as seen from the left of Fig. 1.

The body E, is preferably of cast brass, and is bolted at its base to a shelf extending from the press, or at any convenient point between the press and the pump or head.

In Fig. 3, the letter A indicates the pass way through which the water flows from the pump to the valve.

B indicates the pass way through which the water flows from the valve to the press, or the positions of the pump and press might be reversed.

C indicates the valve chamber, and D indicates the outlet or waste pipe, which also opens into the valve chamber C. At the lower part of the valve chamber, and just above the waste pipe, is arranged a valve seat, which is covered by a check valve 1, a small hole pierces this check valve, and connects the valve chamber with the waste pipe. In the top of the check valve and just above the small hole, is arranged a valve seat which is covered by a safety valve 2, which has a stem extending through a stuffing box in the body of the valve E, and connected at its upper end to a lever, by means of a pin, shown at 11. This lever, indicated by the figure 7, has a handle at one extremity, and is fulcrumed on a pin 12, near the other end. Attached to an extension beyond the fulcrum is a spring 3, with adjustable tension, tending to lift the safety valve. A trigger 6 is situated between the safety valve stem and the handle end of the lever, engaging with a projecting tooth on a lever 8, which has a weight 4 attached to it for counteracting the lifting spring 3. The stem of the safety valve 2, is somewhat larger in diameter than its seat, consequently, any hydraulic pressure within the valve chamber C, tends to lift the safety valve 2, by an amount due to the difference in area between the valve seat, and a cross-section of the rod or stem where it enters the chamber C, whereas the same pressure would tend to hold the check valve 1 against its seat, this being in accordance with the well known principles of hydraulics. When the hydraulic pressure within the valve chamber C becomes sufficiently great, the safety valve will lift and allow enough water to escape through the small orifice in the check valve, to reduce the pressure slightly, when the weight will force the valve back to its seat again. This constitutes the automatic safety valve of the apparatus, and fixes the limit for the highest pressure.

If it is desired to have the valve operate at a pressure within the limiting pressure, the trigger 6, must be disengaged from the weight lever, or the operator may lift on the lever handle 7, when a pressure gage indicates the required pressure.

In order that the valve may be made to operate automatically at any desired pressure, there is arranged a piston, entering the pressure chamber through a stuffing box; this piston 10 is prevented from being easily forced outward by an adjustable compression spring 5, but when the hydraulic pressure on the end of the piston 10 has forced it out a certain

distance, it strikes against the trigger 6, and the weight is released, allowing the safety valve to lift. By turning the hand nut 9, one way or the other, the resistance of the spring 5 can be regulated so as to release the weight at any desired pressure.

A shoulder on the safety valve 2, which is beneath a projecting ridge around the top of the check valve 1, limits the motion of the safety valve. The hydraulic pressure on the check valve 1 counteracts the pull of the spring 3, until the pressure is reduced gradually by the flow of water through the small orifice. When the pressure is sufficiently reduced the spring 3 acts, lifting both valves and allowing the water to escape freely. To set the valve for another stroke of the press, the lever 7 is pushed down till both valves are seated; the weight 4, is then lifted until the trigger catches.

I am aware of the similarity between this valve and the well known "floating" or "pilot" valve type, which is composed of a tubular plug valve and an inner or pilot valve: I therefore do not claim this combination broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a hydraulic pressure release valve, the combination of a safety valve 2, and a check valve 1, combined to operate in the manner described, with a controlling lever 7, attached to the safety valve stem at its outer end in the manner shown; a spring 3, connected with the lever 7, tending to hold both said valves open; a weight 4, hung from a lever 8; a spring trigger 6, attached to lever 7, and arranged to engage the lever 8, substantially as shown, whereby the weight 4, is brought to bear upon both valves, holding them seated until a sufficient hydraulic pressure upon the safety-valve is reached to overcome the weight 4, and the hydraulic pressure is released to a point where the weight again seats the safety-valve.

2. In a hydraulic pressure release valve, the combination of a safety valve 2, and a check valve 1, combined to operate in the manner described, with a controlling lever 7, attached to the safety valve stem at its outer end in the manner shown; a spring 3, connected with the lever 7, tending to hold both said valves open; a weight 4, hung from a lever 8; a spring trigger 6, attached to the lever 7, and arranged to engage the lever 8, substantially as shown, whereby the weight 4, is brought to bear upon both said valves holding them seated; a tripping device, for the purpose of disengaging said spring-trigger 6, from said weight lever 8, consisting of a small piston acted upon at one end by the same hydraulic pressure that is acting upon the said valves, the other end abutting against an adjustable opposing spring, the parts being constructed, combined and arranged to operate automatically at any desired pressure, substantially in the manner and for the purpose specified.

GEORGE B. LAMB.

Witnesses:
G. E. HALL,
HOWARD L. ISBELL.