No. 881,412. PATENTED MAR. 10, 1908.

G. W. KNIGHT.

MECHANISM FOR OPERATING INDICATORS FOR HYDRAULIC VALVES.

APPLICATION FILED MAR. 14, 1907.

2 SHEETS—SHEET 1.

FIG. 1

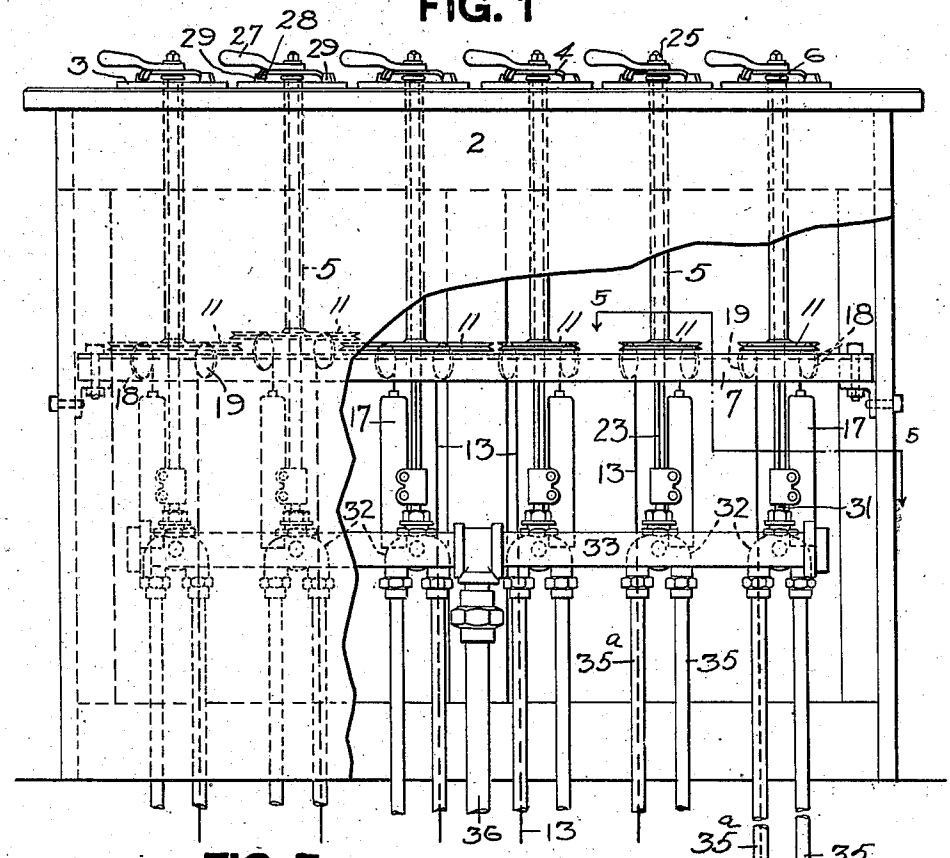
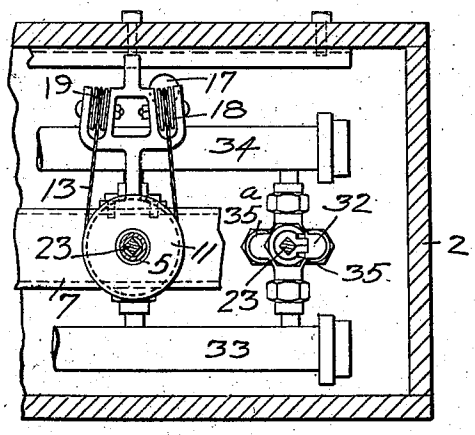


FIG. 5



WITNESSES.

J. P. Keller

Robert C. Potter

INVENTOR.

Gerald W. Knight

By Ray Potter & Sutton

attorneys

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 881,412. PATENTED MAR. 10, 1908.

G. W. KNIGHT.

MECHANISM FOR OPERATING INDICATORS FOR HYDRAULIC VALVES.

APPLICATION FILED MAR. 14, 1907.

2 SHEETS—SHEET 2.

FIG. 2

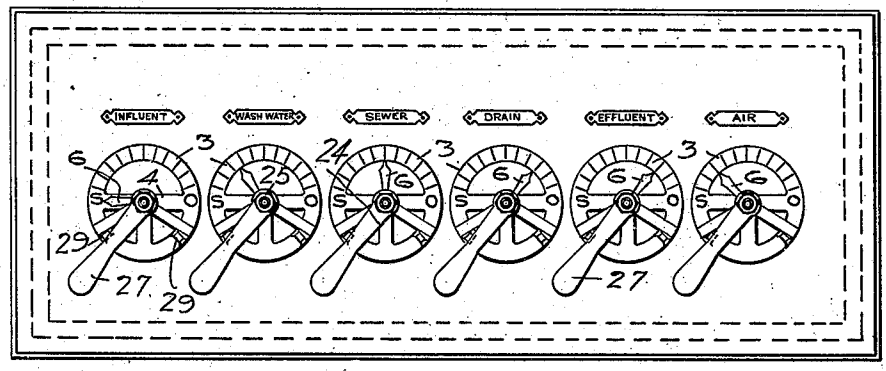


FIG. 3

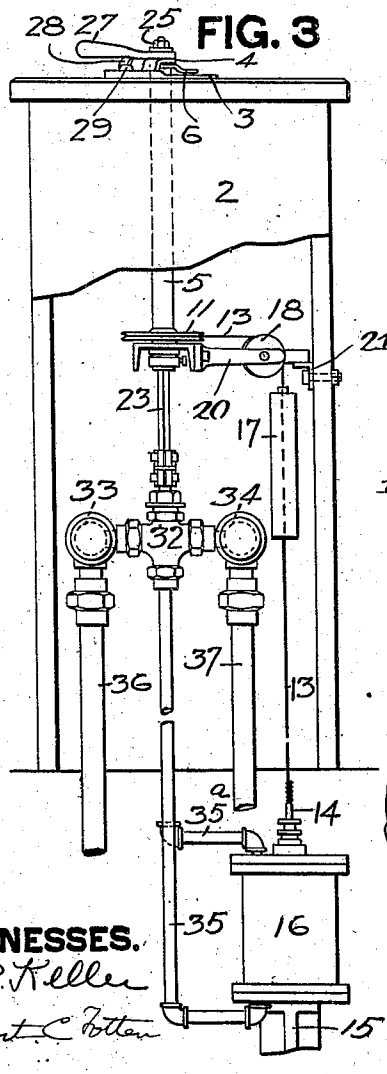


FIG. 4

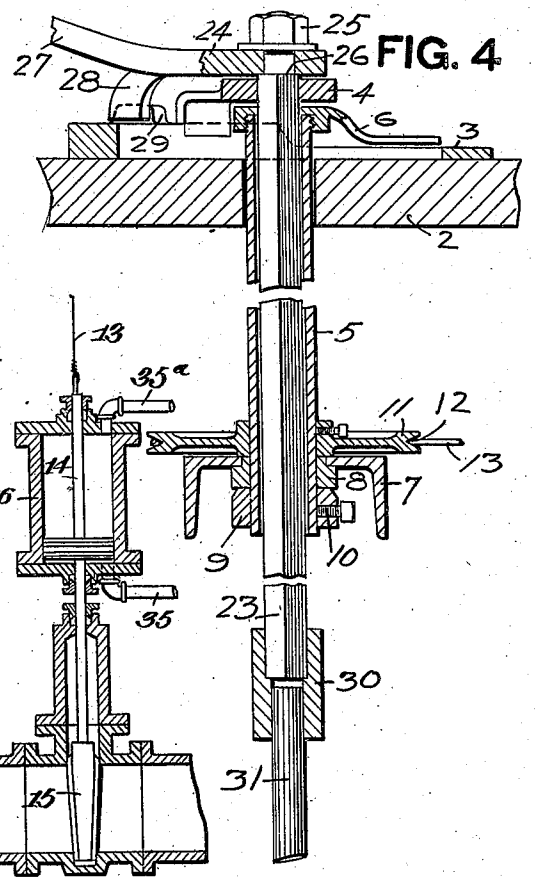


FIG. 6.

WITNESSES.

J. R. Keller

Robert C. Potter

INVENTOR.

Gerald W. Knight

By Ray Potter & Hunter

attorneys

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GERALD W. KNIGHT, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO PITTSBURGH FILTER MANUFACTURING CO., OF PITTSBURG, PENNSYLVANIA.

MECHANISM FOR OPERATING INDICATORS FOR HYDRAULIC VALVES.

No. 881,412. Specification of Letters Patent. Patented March 10, 1908.

Application filed March 14, 1907. Serial No. 362,332.

To all whom it may concern:

Be it known that I, GERALD W. KNIGHT, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Mechanism for Operating Indicators for Hydraulic Valves; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to mechanism for operating indicators for valves, and more especially where such valves are employed in connection with filtration plants.

The object of my invention is to provide a simple form of apparatus by means of which the amount of movement of the valve may be regulated and controlled with great accuracy, and its slightest movement registered, all the parts, pipe connections, etc., being so constructed and arranged as to be readily accessible at all times for purposes of inspection or repair.

To these ends my invention comprises, generally stated, a suitable frame or table, registering mechanism and connections between said registering mechanism and the plunger of the hydraulic valve, together with means for regulating the supply of fluid to operate the plunger of said valve, whereby the operator is able to tell with great accuracy from the registering mechanism just to what extent the valve has been opened or closed.

In the accompanying drawings Figure 1 is a side view of my improved apparatus, the stand or table being broken away to show the interior thereof; Fig. 2 is a plan view; Fig. 3 is an end elevation partly broken away; Fig. 4 is an enlarged detail view; Fig. 5 is an enlarged plan view of the pulley mechanism for turning the main hollow shaft; Fig. 6 is a vertical sectional view of the hydraulic valve.

Referring to the drawings the numeral 2 designates a suitable table or stand which may be composed of hard wood, slate, marble or other suitable material. Located in the top of said table are the indicator plates 3 which may be formed of brass or other suitable material. These indicator plates have a graduated scale formed thereon together with the letters S and O indicating "Shut" and "Open". On said plates are secured the stirrups 4 having central openings corresponding with central openings in the dial plates 3. In the drawing six of these dial plates have been illustrated, each having opposite thereto a name plate bearing the terms "Air", "Effluent", "Drain", etc. As the construction of the registering mechanism for each dial is the same it will only be necessary to describe one in detail.

The hollow shaft 5 is threaded at its upper end and engaging said threaded portion above the dial plate 3 is the indicator hand 6. The lower end of said shaft passes through an opening in the channel beam 7 extending from one end of the table to the other. A bushing 8 engages the opening in said channel bar and surrounds said shaft and below said bushing is the collar 9 secured to said shaft by the set screw 10. In this manner the shaft 5 is kept accurately in alinement for the purpose hereinafter set forth. Secured to the shaft 5 is the sheave 11 provided with the V-shaped groove 12 in its periphery. A woven wire cord, chain or other flexible belt 13 passes around the sheave 11 engaging the groove 12 thereof, said cord being secured at one end to the plunger 14 of a suitable hydraulic or other fluid operated valve 15, said plunger being connected to the ordinary piston working in the cylinder 16. The opposite end of the cord 13 is secured to a weight 17. Idle pulleys 18 and 19 are supported in the bracket 20 secured to the channel 7 and resting at its opposite end on the angle 21 secured to the inner wall of the stand or table 2, said pulleys receiving the cord 13 as it passes from the sheave 11. The pulley 18 receives that end of the cord carrying the weight 17 while the pulley 19 engages that portion of the cord which passes down and is attached to the plunger 14 of the hydraulic valve. The action of the weight 17 is to bring sufficient tension upon the cord to make sure of proper indicating on the indicator dial, as fully hereinafter set forth.

Extending down within the shaft 5 is the valve operating rod 23, said rod passing up through the stirrup 4. Secured to the upper end of the rod 23 is the controller-arm 24, said arm being secured to said rod by means of the nut 25, said arm being held between said nut and a shoulder 26 on said rod. The controller-arm 24 has the handle 27, and projecting down from said rod is the lug 28, said lug being adapted to engage the stops 29 upon the dial 3. The lower end of the rod

23 is connected by the coupling 30 to the stem 31 of a suitable 3-way valve 32. As this 3-way valve may be of any suitable construction it has not been deemed necessary to illustrate the same in detail. This 3-way valve 32 is connected up to the supply pipe 33 and the discharge pipe 34, as well as to the pipes 35 and 35ª leading to and from the inlet and exhaust ports of the hydraulic cylinder, respectively. The supply pipe 33 and the discharge pipe 34 operate in connection with the different valves and are arranged horizontally within the table 2, said pipes being connected up to the vertical supply and discharge pipes 36 and 37 respectively. By this construction the pipe connections are all within the table where they are readily accessible in case it is necessary to make repairs or for other purposes.

When my improved apparatus is in use and it is desired to operate, for instance, the valve supplying air to the filter, the operator grasps the controller-arm 24 of the dial opposite the name plate bearing the word "Air", and moves said arm to the right, whereby the valve rod 23 is correspondingly turned and the 3-way cock 32 is operated so as to open the valve to permit the water to pass through the supply pipe 33 into the pipe 35 leading to the inlet of the hydraulic cylinder, whereupon the plunger in said cylinder is lifted and with it the hydraulic valve. This movement of the hydraulic valve will permit the air to pass into the filter bed and the amount of the movement of said hydraulic valve is at the same time recorded on the dial 3 in the following manner: Just as soon as the plunger 14 of the hydraulic valve rises, the weight 17 acting to draw the cord 13 taut will at the same time act to turn the sheave 11 around which said cord passes, and this rotary movement is transmitted to the shaft 5. As the shaft 5 rotates the indicator hand 6 will be moved over the graduated scale on the dial and said scale having been properly proportioned with reference to the amount of movement of the hydraulic valve, said indicator hand will accurately register just the position of the hydraulic valve, and as a consequence the amount of air to be admitted to the filter is thus accurately and definitely controlled. The slightest movement on the part of the controller arm 24 will have its effect upon the indicator hand and in this way the indicator hand may be moved from "Shut" to "Open" or held at any intermediate point. The movement of the controller-arm is governed by the stops 29 into contact with which the said arm comes when the valve is shut or wide open.

The dials and the controller-arms are in full view and within easy reach of the operator, while at the same time the operating parts are all contained within the body of the table, so that by removing the back of the table which may be hinged if desired, all the operative parts are exposed to view as well as the pipe connections so that ready access may be had for purposes of inspection or repair.

What I claim is:

1. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a registering device, connections between said valve and said registering device, and means for controlling the supply of fluid to said valve to operate the plunger of same.

2. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a registering device, connections between said valve and said registering device, a controller-arm, a fluid supply valve, and connections between said controller-arm and said fluid supply valve for admitting fluid to operate the plunger of said hydraulic valve.

3. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial, an indicator hand, connections between said indicator hand and the plunger of said valve, a controller-arm, a fluid supply valve, and connections between said arm and said fluid supply valve for admitting fluid to operate the plunger of said hydraulic valve.

4. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial, an indicator hand, a sheave connected to said indicator hand, a cord passing around said sheave secured at one end to the plunger of said hydraulic valve, means for holding said cord taut as said plunger ascends, and means for controlling the supply of fluid to said hydraulic valve to operate said plunger.

5. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial, an indicator hand, a sheave connected to said indicator hand, a belt or cord engaging said sheave and connected at one end to the plunger of said hydraulic valve, a weight attached to the other end of said cord, and means for controlling the supply of fluid to said valve to operate the said plunger.

6. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial, an indicator hand, a sheave connected to said indicator hand, a belt or cord engaging said sheave, idle pulleys for said cord, one end of said cord being connected to the plunger of said valve, a weight attached to the other end of said cord, and means for controlling the supply of fluid to said valve to operate said plunger.

7. In mechanism for operating hydraulic valves, the combination with a suitable

frame or table, of a hydraulic valve, a dial, an indicator hand, a shaft connected to said indicator hand, a sheave on said shaft, a belt or cord engaging said sheave connected at one end to the plunger of said valve, means for holding said belt taut as said plunger rises, and means for controlling the supply of fluid to said valve to operate said plunger.

8. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial, an indicator hand, a hollow shaft connected to said hand, a sheave carried by said shaft, connections between said sheave and the plunger of said hydraulic valve, a controller-arm over said dial, a rod connected to said controller arm passing down through said hollow shaft, and connections between said rod and a fluid supply valve for supplying fluid to said hydraulic valve to operate the plunger of same.

9. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial, an indicator hand, means for operating said indicator hand by the movement of the plunger of said hydraulic valve, a controller-arm over said dial, a fluid supply valve for admitting fluid to operate the plunger of said hydraulic valve, connections between said controller arm and said supply valve, and stops on said dial controlling the movement of said controller arm.

10. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a dial plate, a stirrup secured to said dial plate, a hollow shaft extending up through said dial plate, an indicator hand on said shaft, a sheave at the lower end of said shaft, connections between said sheave and the plunger of said valve, a valve rod passing up through said hollow shaft and through said dial and stirrup, a controller arm secured to said rod above said stirrup, a fluid supply valve, and connections between said rod and said fluid supply valve for admitting fluid to operate the plunger of said hydraulic valve.

11. In mechanism for operating hydraulic valves, the combination with a suitable frame or table, of a hydraulic valve, a registering device on top of said table, connections between said valve and said registering device contained within said table, supply and discharge pipes for said hydraulic valve within said table, a valve for controlling said supply and discharge pipes contained within said table, and means for controlling the supply of fluid to said hydraulic valve to operate the plunger of the same.

In testimony whereof, I the said GERALD W. KNIGHT have hereunto set my hand.

GERALD W. KNIGHT.

Witnesses:
ROBT. D. TOTTEN,
ROBERT C. TOTTEN.