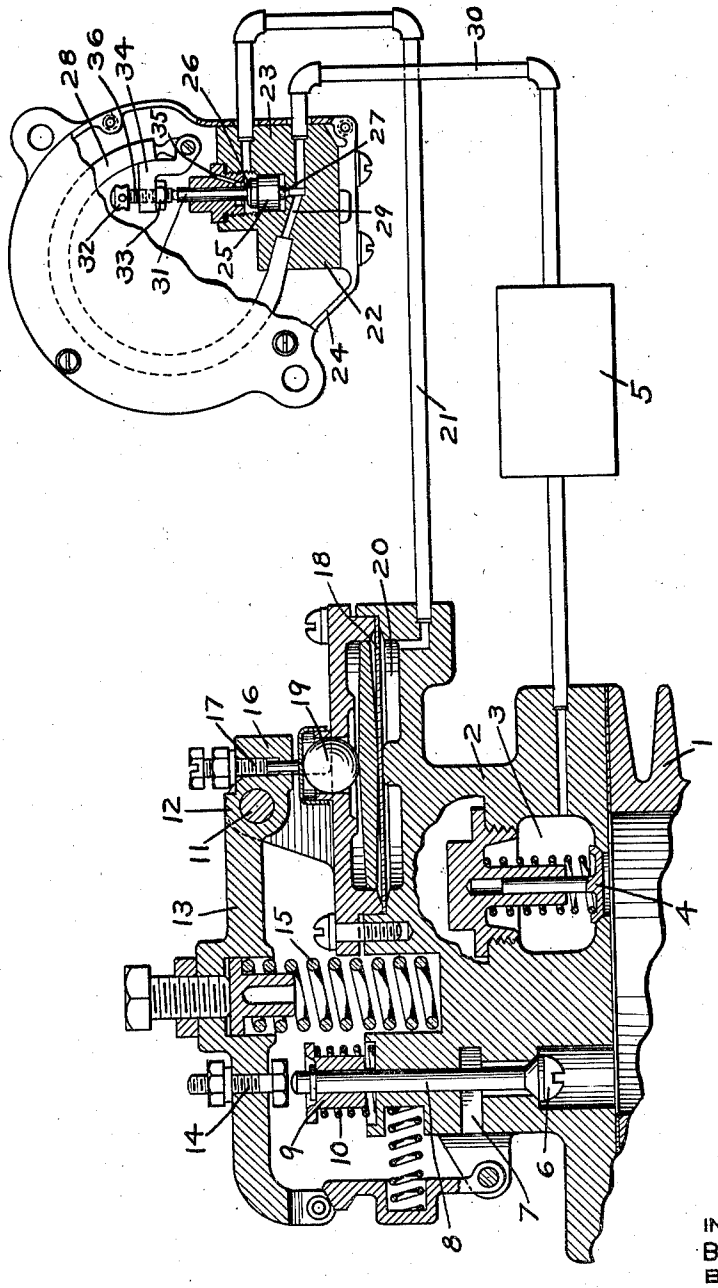
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COMPRESSOR UNLOADER GOVERNOR

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COMPRESSOR-UNLOADER GOVERNOR

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This invention relates to fluid compressors and more particularly to a governor device for controlling the loading and unloading of the compressor.

The principal object of my invention is to provide an improved compressor unloader governor, which is simple in construction and which can be cheaply manufactured.

In the accompanying drawing, the single figure is a diagrammatic view, partly in section, of a portion of a fluid compressor and having associated therewith an unloading means and a compressor unloader governor constructed in accordance with my invention.

The construction shown in the drawing comprises a fluid compressor cylinder 1, shown in part, and having a cylinder head 2 provided with a valve chamber 3, containing the usual discharge valve 4, for controlling communication from the fluid compressor 1 to the usual storage reservoir 5.

An unloading valve 6 controls communication from the compressing cylinder to an atmospheric port 7 and is provided with an operating stem 8. Carried at the outer end of the stem 8 is a member 9 which is subject to the pressure of a coil spring 10 acting through the stem 8 to urge the valve 6 to its seat.

Pivotally mounted on a pivot pin 11 carried by the head 2 is a lever 12 having a long arm 13 provided with an adjustable screw 14 adapted to engage the end of the valve stem 8. A spring 15 interposed between the cylinder head 2 and the arm 13 urges the arm away from the stem 8.

The short arms 16 of the lever 12 carries an adjustable screw 17 to which the movement of a flexible diaphragm 18 is transmitted through a ball 19. The chamber 20 at one side of the diaphragm 18 is connected to a pipe 21 which leads to my improved governor device 22.

The governor device 22 comprises a casting 23 which is mounted in a casing 24 and mounted in a cavity in the casting is a double beat piston head 25 having valves 26 and 27. A Bourdon tube 28 is mounted in the casing 24 and has one end secured in the casting 23 and connected to a passage 29 which leads to pipe 30.

The double beat piston head 25 is provided with a stem 31, the outer end of which is adapted to engage the end of an adjusting screw 36, having screw-threaded engagement in a member 34, secured to the free end of the Bourdon tube 28. The screw 36 is provided with a head 32 and is maintained in its position of adjustment by a lock nut 33.

Assuming that the screw 36 has been adjusted for the pressure at which it is desired to unload the compressor, at all pressures below this pressure, the spring action of the tube will exert a downward pressure on stem 31 to hold the valve 27 seated against the pressure in pipe 30.

When the pressure in pipe 30 has increased to a point where the internal pressure in the tube 28 plus the pressure acting on the exposed area of the valve 27 exceeds the spring action of the tube 28, the valve 27 will be slightly lifted from its seat, permitting leakage of fluid from pipe 30 to the space below the piston head 25.

The pressure of fluid from pipe 30 will then act on the full area of piston head 25, so as to cause a quick upward movement thereof and thereby causing the valve 26 to seat.

It will be noted that the area of the valve 26 is greater than that of the valve 27, so that although the spring action of the tube 28 is increased by its upward movement, the fluid pressure acting on the piston head 25 will be sufficient to hold the valve 26 seated.

When valve 27 is unseated, fluid under pressure is supplied from the reservoir 5 through pipe 30 to pipe 21, by leakage past the piston head 25, and thence to diaphragm chamber 18. The diaphragm 18 is then moved upwardly, so that the lever 12 is actu-

ated to cause the screw 14 to engage and move the stem 8 and thereby unseat the valve 6. The compressing cylinder being then opened to the atmospheric port 7, the compressor operates without compressing fluid into the reservoir 5.

When the fluid pressure in the reservoir 5 has fallen sufficiently to permit the spring action of the tube 28 to overcome the pressure of fluid acting on the under side of the piston head 25, the valve 26 will be slightly lifted from its seat and leakage of fluid from pipe 30, past the piston head 25, to the chamber above the piston head will occur.

The area of the exhaust port 35 is so restricted that the pressure above the piston head 25 will build up sufficiently to permit the spring action of the tube 28 to quickly shift the piston head so as to cause the valve 27 to seat.

With valve 26 unseated, fluid is vented from diaphragm chamber 20 through pipe 21 to the atmosphere, by way of port 35, so that the pressure of spring 15 acts to shift the arm 13 upwardly, thereby permitting the valve 6 to seat. The compressor then operates to compress fluid into the reservoir 5.

While one illustrative embodiment of the invention has been described in detail, it is not my intention to limit its scope to that embodiment or otherwise than by the terms of the appended claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a fluid compressor unloading device having a movable abutment operated by an increase in fluid under pressure for unloading the compressor, of a governor comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, valve means for controlling the fluid pressure on said abutment, and a member carried by said tube for engaging said valve means, the resiliency of the tube urging said valve means in one direction and the expansion of the tube by fluid under pressure urging said member away from said valve means.

2. The combination with an unloading device for a fluid compressor operable by variations in fluid under pressure, of a governor device for controlling the fluid pressure for operating said unloading device comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, valve means for controlling the fluid pressure on said unloading device and having a valve stem, and a member carried by said tube for engaging said stem, the tube being under initial tension to urge the valve means in one direction, and the expansion of the tube by fluid under pressure urging said member away from said valve stem.

3. The combination with an unloading device for a fluid compressor operable by variations in fluid under pressure, of a governor device for controlling the fluid pressure for operating said unloading device comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, a double beat valve device for controlling the supply and release of fluid under pressure to and from said unloading device and having a valve stem, and a member carried by said tube for engaging said stem, the resiliency of the tube itself being utilized to urge said member into engagement with said valve stem for operating said valve device to release fluid under pressure from said unloading device.

4. The combination with an unloading device for a fluid compressor operable by variations in fluid under pressure, of a governor device for controlling the fluid pressure for operating said unloading device comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, a valve for supplying fluid under pressure to said unloading device, a valve for venting fluid from said unloading device, a stem for operating said valves, and a member carried by said tube for engaging said stem, the stem being operated by the resiliency of the tube for seating one valve and the expansion of the tube by fluid under pressure urging said member away from said stem.

5. The combination with an unloading device for a fluid compressor operable by variations in fluid under pressure, of a governor device for controlling the fluid pressure for operating said unloading device comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, a valve for supplying fluid under pressure to said unloading device, a valve for venting fluid from said unloading device, a stem for operating said valves, a member carried by said tube, and an adjustable screw mounted in said member for operating said stem.

6. The combination with an unloading device for a fluid compressor operable by variations in fluid under pressure, of a governor device for controlling the fluid pressure for operating said unloading device comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, valves for controlling the supply of fluid under pressure to and its exhaust from said unloading device, a stem for operating said valves, means carried by said tube for engaging said stem, and a piston head carried by said stem and subject to fluid pressure compressed by the compressor, the stem and said valves being operated by said means in one direction, and fluid under pressure on said piston urging said valves in the opposite direction.

7. The combination with an unloading device for a fluid compressor operable by variations in fluid under pressure, of a governor device for controlling the fluid pressure for

operating said unloading device comprising a Bourdon tube subject to the pressure of fluid compressed by the compressor, a valve for supplying fluid under pressure to said unloading device, a stem operated by said tube for operating said valve, and a piston head carried by said stem and exposed to fluid compressed by the compressor when said valve is lifted from its seat.

In testimony whereof I have hereunto set my hand, this 23rd day of May, 1928.

BURTON S. AIKMAN.