

April 16, 1935.

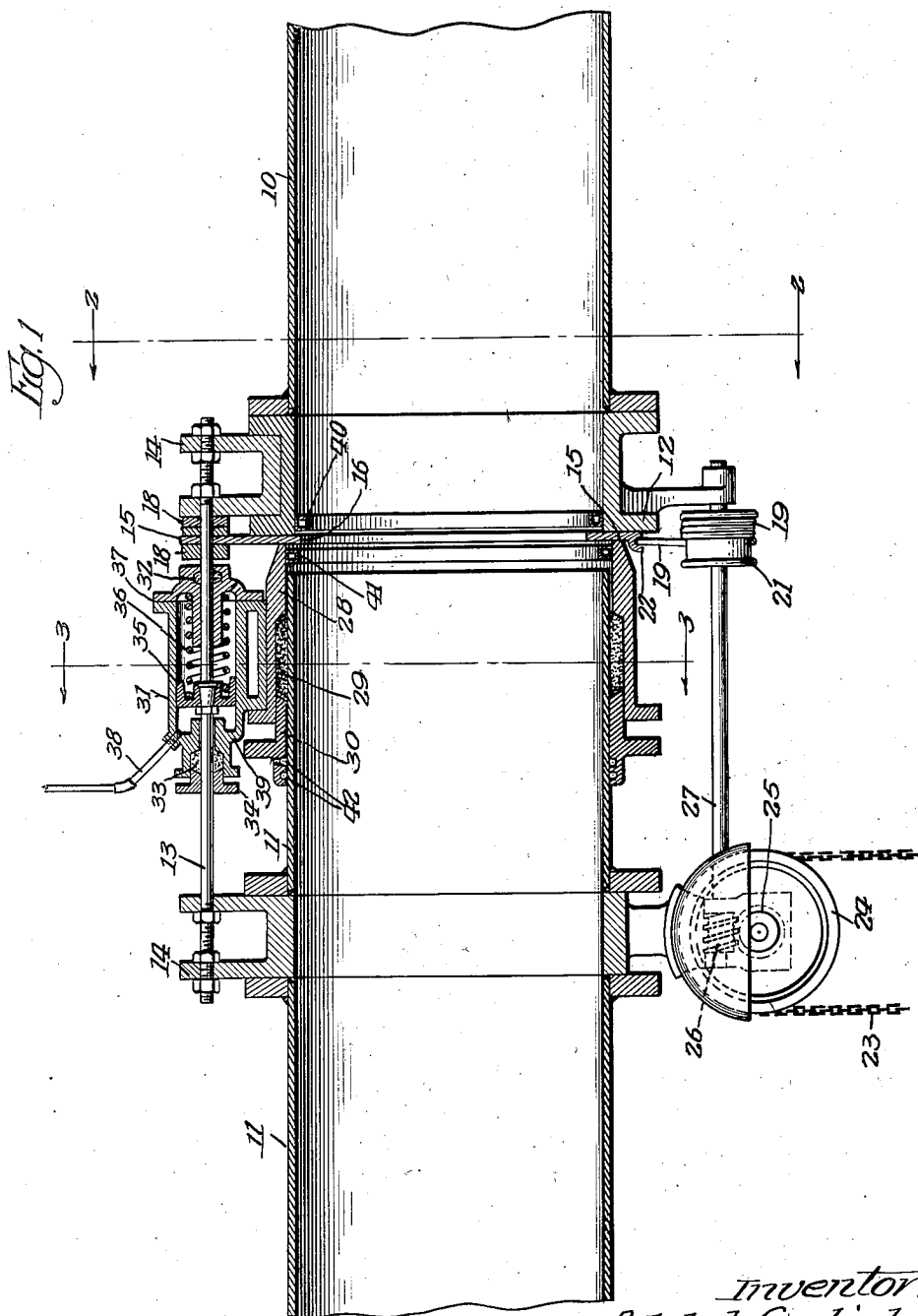
A. GERLICH

1,998,080

VALVE MECHANISM

Filed March 16, 1931

2 Sheets-Sheet 1



Inventor:
Adolph Gerlich
By *Ed. Jochem*
Atty.

April 16, 1935.

A. GERLICH

1,998,080

VALVE MECHANISM

Filed March 16, 1931

2 Sheets-Sheet 2

Fig. 3

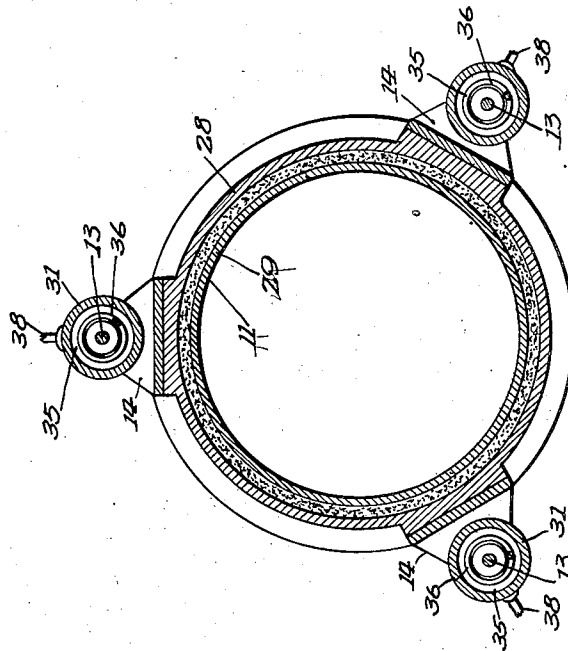
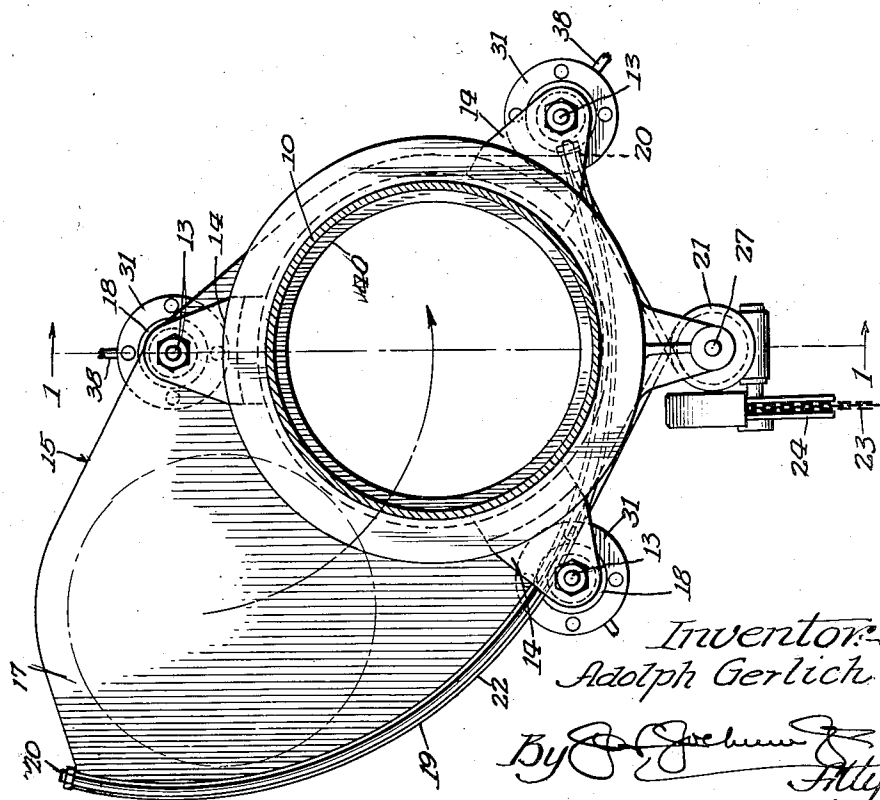


Fig. 2



Inventor:
Adolph Gerlich

By *[Signature]*
Atty.

UNITED STATES PATENT OFFICE

1,998,080

VALVE MECHANISM

Adolph Gerlich, Waukegan, Ill.

Application March 16, 1931, Serial No. 522,846

8 Claims. (Cl. 251-167)

This invention relates to improvements in valve mechanism particularly adapted, though not necessarily limited in use, for opening and closing gas mains, air mains, steam lines, water lines and the like.

More specifically the invention has reference to valves used for opening and closing gas mains and is particularly advantageous in connection with both cold and hot gas.

The usual type of valves used in gas or air mains consists of a goggle plate which oscillates about a point, or slides between two guides, and seats against two annular bases attached to a set of flanges attached to the main, either in rigid or floating position to permit of the free movement of the goggle plate regardless of any contraction or expansion of the main.

These types of valves are expensive in construction, and require considerable time for each movement, and they more or less restrict the cross section of the pipe. Furthermore, it is difficult to maintain the two ends of the main in alinement with each other, with the result that the operation of the valve in many cases is very difficult, due to the great stresses set up in heavy and long mains, particularly when hot gases are conveyed, which causes unequal expansion and contraction, resulting in a binding in these types of valves, thereby preventing their perfect seating. Once leakage has started, the cutting action of dust in the gases quickly enlarges the leaky places, resulting in loss of gas, and danger to human health and life.

It is one of the objects of the present invention to overcome all of these difficulties and objections by providing a valve with one or more sliding sleeves, which latter is or are designed to retreat and advance as the valve is opened or closed, and which will not prevent the main from sliding back and forth under contraction and expansion.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a longitudinal sectional view taken on line 1-1, Figure 2, of a valve mechanism constructed in accordance with the principles of this invention and showing the same applied to a main.

Figure 2 is a sectional view taken on line 2-2, Figure 1.

Figure 3 is a sectional view taken on line 3-3, Figure 1.

Referring more particularly to the drawings the numerals 10 and 11 designate sections of the main to which the valve is applied. The section 10 is provided with a suitable flange 12 at the end thereof and these sections are held spaced from each other and in alinement by means of suitable tie rods 13 which are arranged about the main sections and are connected to the respective main sections against movement with respect thereto, by their extremities through the medium of suitable anchors 14 and are spaced about said sections. These anchors 14 may be in the form of flanges or collars having suitable projections through which the rods pass and are secured to the main sections in any suitable manner.

Pivotally mounted, preferably upon one of the tie rods 13 is a valve or goggle plate 15 provided with the usual opening 16 therethrough and a closed portion 17. The valve or goggle plate is held in position against lateral displacement by means of suitable guiding washers 18 held in position in any suitable manner and the valve is held in position so as to engage and move across the face of the flange 12.

Any suitable means may be provided for swinging the valve about its pivot, but a suitable and efficient means embodies a cable or flexible member 19 which is secured by its ends as at 20 to the valve, and passes for any desired number of times around a drum 21. The cable is adapted to be seated in a suitable groove 22 in the periphery of the valve, and as the drum 21 is rotated the valve will be swung in one direction or the other about its pivot according to the direction of rotation of the drum. The drum may be rotated in any suitable manner such as by means of a chain or flexible member 23 operated by hand or otherwise, which passes over a pulley 24. Connected to the pulley 24 for rotation therewith is a worm gear 25 which meshes with a worm 26 carried by a shaft 27 and to which shaft 27 the drum 21 is connected.

Slidably mounted upon the main section 11 is a sleeve 28 which is of any desired configuration and of any desired size and between the sleeve and the periphery of the main section is a suitable packing 29 held in position by means of a packing nut or gland 30, so that a fluid tight joint will be formed between the sleeve and the main section.

Carried by the sleeve 28 are cylinders 31, any number of which may be provided, in the pres-

ent exemplification of the invention three are shown, and each of these cylinders is secured to the sleeve section 28 for movement therewith and against movement with respect thereto. The tie rods 13 preferably pass through each of the respective cylinders and suitable packing 32—33 is provided to form a fluid tight joint at the points where the rods pass through the cylinders. A packing nut or gland 34 may also be provided.

These tie rods 13 also serve the purpose of piston rods, to each of which is connected a piston 35 and the piston 35 is held stationary with the rods 33. A coiled spring 36 is interposed between each of the pistons 35 and the head 37 of the respective cylinders and the spring tends normally to move the cylinders 31 in a direction to cause the end of the sleeve 28 to abut the proximate face of the valve or goggle plate 15 and hold the latter tightly against the flange 12. When it is desired to operate the valve, fluid under pressure is delivered to the cylinders 31 through individual pipes 38 and the fluid admitted into the cylinder between the valve 35 and the head 39 of the cylinder will cause the cylinder 31 to be moved in a direction to retract the sleeve 28, thereby freeing the valve or goggle plate 15 to permit the same to be readily operated.

After the valve plate has been positioned, fluid pressure is released from the cylinders 31 and the springs 36 will move the cylinders and sleeve 28 in the opposite direction to again hold the valve.

After the valve 15 has been operated to move the same to either an opening or closing position, the pressure in the cylinders 31 will be released so that the springs 36 will hold the end of the sleeve 28 in either the open or closed position of the valve. It is only when the valve or goggle plate 15 is to be shifted that the sleeve 28 is retracted so as to permit of a freedom of movement of the goggle plate.

Arranged within the main section 10, preferably in proximity to the proximate face of the goggle plate is a water cooled pipe 40 and arranged within the sleeve 28, beyond the end of the main section 11 and supported by the sleeve for movement therewith, is a water cooled pipe 41. Each of these pipes extends about the inner circumference of the respective main sections and are preferably comparatively small and rectangular in cross section. These pipes are so located as to form annular chambers on each side of the goggle plate 15 and in close proximity to the pressure sleeve 28, and water is supplied thereto in any desired or suitable manner (not shown). These pipes are particularly advantageous in the event that hot gas is circulating in the main, as the water in the cooling pipes 40—41 will cause moisture to condense thereupon and such moisture will serve to moisten any dust in the gas, the moistened dust forming a seal against the escape of gas.

The shape of the pipes 40 in cross section is particularly advantageous in that the surface upon which condensation will be formed will be increased.

With this improved construction it will be manifest that by reason of the location of the cylinders 31 upon the sleeve 28, the sleeve will not bind during its advancing and retracting movements and by reason of the use of the tie rods 13 which form the piston rods for the pistons in the cylinders, and which are arranged about the main sections, the pipe main sections on each

side of the valve or goggle plate will be maintained in alinement.

If desired, a lubricating chamber 42 may be provided for the sleeve 28.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In combination, a fluid conducting main embodying two sections the proximate ends of the sections being spaced from each other, tie rods for holding said sections in alinement, a goggle plate valve movable between the sections for controlling the flow of fluid through the main, means for shifting the goggle plate, a sleeve slidable upon one of the main sections and into and out of contact with the proximate lateral face of the goggle plate, said sleeve being guided in its movement by said tie rods, mechanical means for urging the sleeve in one direction, and fluid pressure means for moving the sleeve in the opposite direction, a portion of the sleeve operating means being secured to the said tie rods.

2. In combination a fluid conducting main embodying two sections, the proximate ends of which are spaced from each other, tie rods for maintaining said sections in alinement, a goggle plate valve pivotally mounted upon one of said tie rods and movable across the main to control the flow of fluid therethrough, means for actuating the goggle valve, a sleeve slidable upon one of the main sections and movable into and out of contact with a lateral face of the goggle plate, a cylinder connected with said sleeve, a piston in the cylinder secured to one of the tie rods, a spring in the cylinder between the piston and one end of the cylinder for urging the sleeve in one direction, and means for admitting fluid under pressure between the piston and the other end of the cylinder to move the sleeve in the opposite direction.

3. Valve mechanism comprising a goggle plate, mechanism for actuating said plate, means movable into and out of engagement with a lateral face of the goggle plate to form a fluid tight joint, and a fluid cooled annular chamber at one side of the goggle plate in proximity to the area of engagement of said means with the goggle plate, said chamber providing a condenser surface to cause accumulation of foreign particles to form a fluid seal.

4. Valve mechanism comprising a goggle plate, mechanism for actuating said plate, means movable into and out of engagement with a lateral face of the goggle plate to form a fluid tight joint, and a fluid cooled annular chamber at each side of the goggle plate in proximity to the area of engagement of the said means with the goggle plate, said chambers providing condenser surfaces to cause accumulation of foreign particles to form a fluid seal.

5. Valve mechanism comprising a goggle plate, mechanism for actuating said plate, means movable into and out of engagement with a lateral face of the goggle plate to form a fluid tight joint, and a fluid cooled annular chamber at one side of the goggle plate in proximity to the area of engagement of said means with the goggle plate, said chamber being angular in cross section, said chamber providing a condenser sur-

face to cause accumulation of foreign particles to form a fluid seal.

5 6. A valve for controlling fluid circulating means, said valve comprising a goggle plate, a sleeve, a main section upon which said sleeve is
10 slidable, a gland at the end of the sleeve for sealing the sleeve against fluid leakage, a cylinder connected with the sleeve, a piston in the cylinder,
15 means for holding the sleeve against the goggle plate, said means consisting of a spring in the cylinder between the piston and one end of the cylinder, means for actuating the movable sleeve
20 consisting of a fluid under pressure which acts between the piston and the other end of the cylinder to overcome the stress of the spring, and anchor rods which serve as guides for the sleeve and also as a support for the piston within the cylinder, said rods preserving alinement of the sections of the main on either side of the goggle plate.

25 7. A valve for controlling fluid circulating means, said valve comprising a goggle plate, a sleeve, a main section upon which said sleeve is slidable, a gland at the end of the sleeve for
30 sealing the sleeve against fluid leakage, a cylinder connected with the sleeve, a piston in the cylinder, means for holding the sleeve against the goggle plate, said means consisting of a spring in the cylinder between the piston and one end of the cylinder, means for actuating the movable sleeve consisting of a fluid under pressure which

acts between the piston and the other end of the cylinder to overcome the stress of the spring, anchor rods which serve as guides for the sleeve and also as a support for the piston within the cylinder, said rods preserving alinement of the sections of the main on either side of the goggle plate, and a fluid cooling system consisting of a pipe forming a cooled annular space adjacent the goggle plate and the movable sleeve.

8. In combination, a fluid conducting main 10 embodying two sections, the proximate ends of which are spaced from each other, tie rods for maintaining said sections in alinement, a goggle plate valve pivotally mounted upon one of said tie rods and movable across the main to control 15 the flow of fluid therethrough, means for actuating the goggle valve, a sleeve slidable upon one of the main sections and movable into and out of contact with a lateral face of the goggle plate, a cylinder connected with said sleeve, a 20 piston in said cylinder and connected with one of the tie rods, a spring in the cylinder between the piston and one end of the cylinder for urging the sleeve in one direction, said cylinder being disposed with its length at substantially 25 right angles to the goggle plate, and means for admitting fluid under pressure between the piston and the other end of the cylinder to move the sleeve in the opposite direction.

ADOLPH GERLICH.

30