

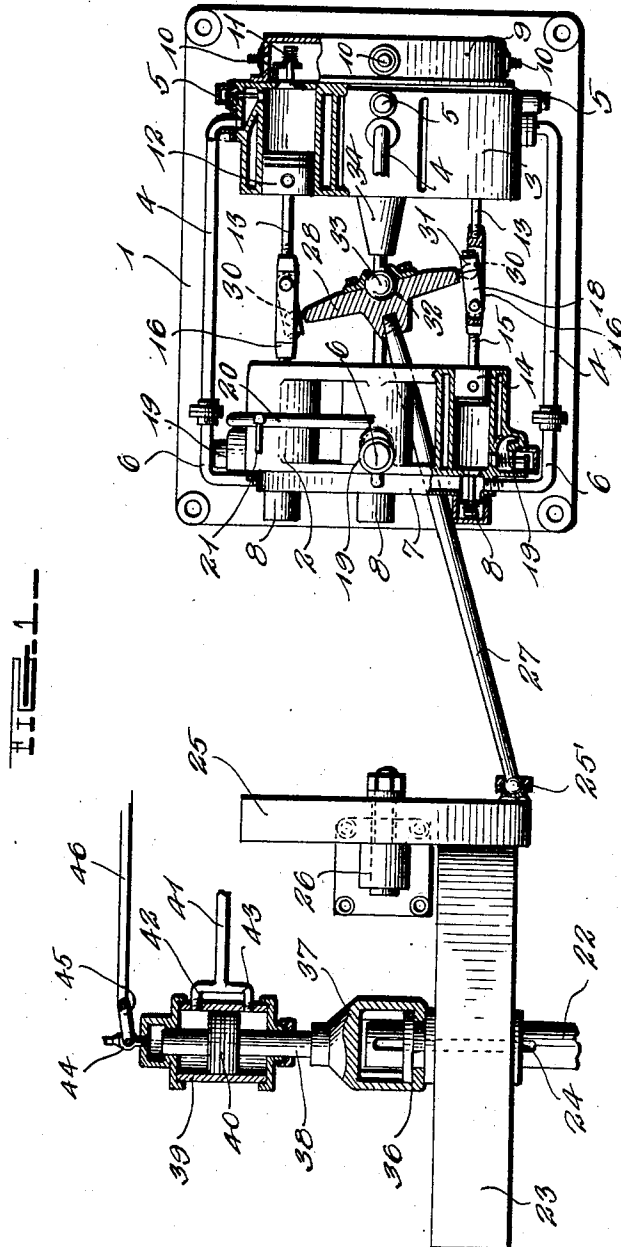
April 8, 1924.

B. F. GILSON
PUMP OPERATING MEANS

1,489,636

Filed Aug. 17, 1922

2 Sheets-Sheet 1



Inventor

Barney F. Gilson

Witness

George W. Greenleaf

By

A. B. Wilson & Co.
Attorneys

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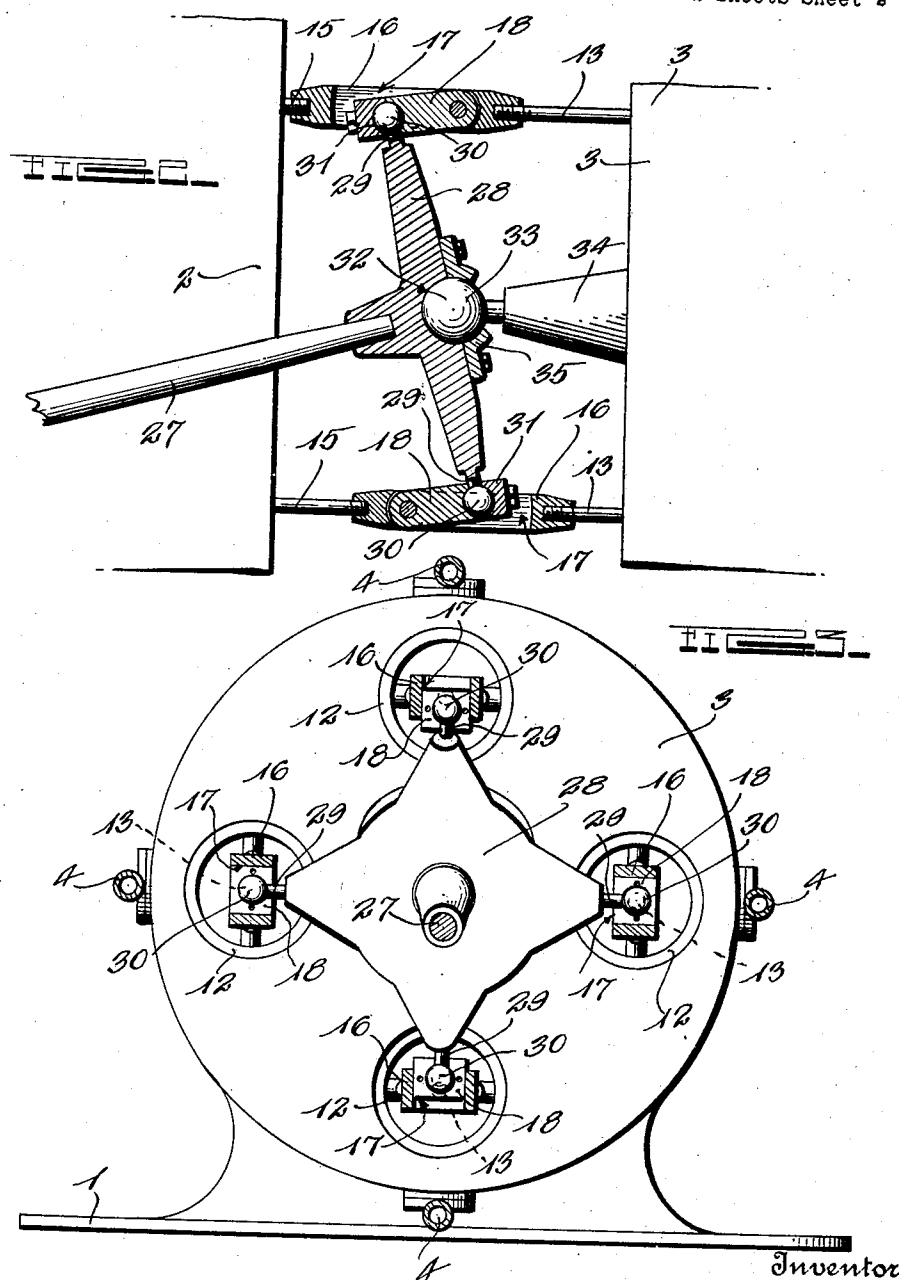
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Witness
Ernest M. Cummings

Inventor
Barney F. Gilson

By *H. B. Wilson & Co.*
Attorneys

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UNITED STATES PATENT OFFICE.

BARNEY F. GILSON, OF ABERDEEN, WASHINGTON.

PUMP-OPERATING MEANS.

Application filed August 17, 1922. Serial No. 582,425.

To all whom it may concern:

Be it known that I, BARNEY F. GILSON, a citizen of the United States, residing at Aberdeen, in the county of Grays Harbor and State of Washington, have invented certain new and useful Improvements in Pump-Operating Means; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved pump operating device and one object of the invention is to provide a pump operating device having improved means for converting rotary movement of a rotatable drive into reciprocating movement for piston rods of a pump.

Another object of the invention is to so construct this pump operating means that the rotatable drive may be provided with a pitman rod which extends at an incline from a point out of alinement with the rotary drive to a point in alinement therewith, the last mentioned end portion of the pitman being the fulcrum end of the pitman and carrying a radially extending head so connected with the piston rods of the pump that as the rotary drive rotates, the head will rotate about its pivot with an oscillating or wobbling movement which will cause the piston rods which are connected with this peripheral portion to be reciprocated.

Another object of the invention is to so construct this pump operating means that any number of piston rods may be reciprocated, it simply being necessary to provide means about the peripheral portion of the pitman head for connection with the desired number of piston rods.

Another object of the invention is to so construct this pump operating means that it will consist of a comparatively few number of parts which will be strong and durable and to so mount them that the pitman may be connected with the rotary drive for universal movement and the head connected with links which extend from the piston rods for universal movement.

This invention is illustrated in the accompanying drawings wherein:

Figure 1 is a top plan view partially in section and showing the improved pump operating means in use.

Figure 2 is an enlarged sectional view

showing the pivotal mounting of the pitman head and connection with the piston rods.

Figure 3 is a transverse sectional view through the pump looking towards the pitman head and low compression cylinders.

The pump which has been shown in Figure 1 is for use in pumping air to a suitable storage tank in which air will be accumulated and placed under a desirable pressure. This pump is provided with a base 1 and adjacent opposite ends of the base 1, there has been provided banks 2 and 3 of cylinders, the cylinders of the bank 2 being high pressure cylinders and the cylinders of the bank 3 being low pressure cylinders. The cylinders are arranged about a common center as shown in Figure 3 and each of the cylinders of the bank 3 has been provided with a pipe 4 which leads from an outlet controlled by a valve 5 and is connected with a pipe 6. The pipes 6 communicate with a manifold chamber 7 of the bank 2 so that air may be pumped through these pipes 4 and 6 into the manifold 7 and pass from the manifold 7 into the cylinders of the bank 2 through the inlets controlled by the valves 8. The bank 3 is provided with a head or air chamber 9 into which air passes through inlets controlled by valves 10. This air will be drawn into the cylinders through inlets controlled by valves 11, it of course being understood that one valve controlled inlet will be provided for each of the low pressure cylinders. Each of the lower pressure cylinders will have its piston 12 provided with a piston rod 13 and each of the high pressure cylinders of the bank 2 will be provided with a piston 14 having a piston rod 15. The piston rods 13 and 15 are connected by couplings 16 which resemble turnbuckles and therefore will be provided with longitudinally extending pockets 17 in which links 18 will be pivotally mounted for swinging movement transversely of the couplings. It will thus be seen that when the couplings are moved, the piston rods will be reciprocated and the piston of one of the low pressure cylinders will be moving on a power stroke while the piston of the corresponding high pressure cylinder is moving to draw air into the cylinder. As this movement takes place, the air which has previously been drawn into the low pressure cylinder through the valve-controlled

- inlet will be forced through the pipes 4 and 6 into the manifold 7. At the same time air will have been drawn into the high pressure cylinder and upon the reverse stroke of the piston rods, the air will be forced out of the high pressure cylinder through an outlet controlled by a valve 19 into a pipe 20 from which one or more pipes 21 extend to a suitable storage tank.
- 10 This pump is to be operated by means of a suitable engine or motor which may be of any suitable type but will preferably be a steam engine and will include a rotating shaft 22 upon which a drive wheel or disk 23 is slidably mounted but secured by a key 24 so that it will rotate with the shaft 22. This drive wheel or disk has its peripheral face engaging a wheel or disk 25 which is rotatably mounted as shown at 26 and extends at right angles to the wheel 23. This wheel 25 may be termed a rotary drive for the piston rods and it is desired to convert rotary movement of this wheel 25 into reciprocating movement for the piston rods.
- 25 Therefore, there has been provided a pitman 27 which has one end portion connected with the wheel 25 out of alignment with the axis of the wheel 25 and connected with the wheel for universal movement as shown at 25'.
- 30 This pitman 27 extends at an incline from the wheel 25 through an open space provided in the center of the bank 2 of high pressure cylinders to a point approximately in alignment with the axis of the wheel 25. This
- 35 pitman is provided with a head 28 which is rigidly mounted upon the pitman and extends radially thereof. Referring to Fig. 3, it will be seen that the head 28 has been shown in the form of a star having four radially extending arms but it will be understood that the specific shape of this head may be changed and further that any number of pump cylinders may be operated according to the size of the pump. This head
- 40 28 is provided at points about its periphery with stems 29 which correspond in number to the couplings and each of which terminates in a spherical head 30 which is held in engagement with the free end portion of one of the links 18 by means of a cap 31 and thereby provides means connecting the head 28 with the links for universal movement. It will thus be seen that when in use, the links will have movement transversely of the couplings and at the same time will have movement radially of the head 28. This head 28 is provided at its center with a pocket 32 to receive the spherical head 33 of a fulcrum post 34. After the head 33 has been positioned in the socket 32, the securing cap 35 will be secured to the head 28 and the head 28 will then be mounted for rotary movement and universal tilting movement. Therefore, as the wheel 25 rotates, the pit-
- 45 man 27 will swing about the fulcrum with its end connected with the head 25 moving in a circular path and the head 28 rocking about the head 33 of the fulcrum post and at the same time moving with an oscillating or wobbling movement. In view of the fact that the head 28 is given this movement, each of the stems 29 will have a swinging movement longitudinally of the piston rods and therefore as the head 28 rotates, the piston rods will be reciprocated and the pump operated as desired.
- It is desired to have the pumping controlled according to the pressure in the air tank and therefore the disk or wheel 23 has been provided with a hub extension provided with an annular groove 36 into which fits the head 37 of a shaft 38. This shaft 38 extends into a cylinder 39 and carries a piston 40. An air pipe 41 which leads from the storage tank is provided with branches 42 and 43 which communicate with the cylinder 39 upon opposite sides of the piston 40. At one end, the cylinder has been provided with an outlet provided with a control valve 44. This valve 44 is provided with a handle 45 by means of which the valve may be opened and closed and this handle is connected with an actuating rod 46. This rod 46 will lead to a suitable governor controlled by pressure in the tank. Ordinarily, this valve 44 will be opened and therefore the pressure of the air passing through the branch 43 will be greater than the pressure upon the opposite side and the piston will be moved to draw the wheel 23 towards the axis of the wheel 25. When the pressure in the storage tank becomes greater than desired, the automatic governor referred to will move the rod 46 to act upon and close the valve 44. The pressure upon opposite sides of the piston 40 will then be equalized and the wheel 23 will be moved to the position shown thus cutting down the speed of the wheel 25 and of course causing slower operation of the pump. It will thus be seen that this pump has been provided with improved operating means and has been provided with a special construction and arrangement of pitman including a radially extending head so connected with the coupling 16 that as the wheel 25 rotates, the rotary movement will be transformed into reciprocating movement of the piston rods.
- I claim:
1. The combination of a pump including spaced cylinder banks having their cylinders in opposed relation and each having its cylinders spaced about the circumference of a circle, a pivot post extending from the center of one of said cylinder banks toward the other bank, the other bank having an open central portion, pistons in said cylinders having piston rods extending from the inner ends of the cylinders, couplings connecting the piston rods of one bank with the

piston rods of the other bank, links pivotally carried by said couplings and extending longitudinally thereof and having swinging movement radially of said pivot post, a disk
 5 pivoted at its center to said pivot post for universal rocking movement about the same, stems extending from the periphery of said disk and terminating in spherical heads connected with the free end portions of said
 10 links for universal movement, an operating rod rigid with and extending from the center of said disk and through the bank having the open central portion, and a rotary drive having the outer end of said operating rod
 15 eccentrically connected therewith for universal pivotal movement.

2. The combination of a pump including spaced cylinder banks having their cylinders in opposed relation and each having
 20 its cylinders spaced about the circumference of a circle, a pivot post extending from the

center of one cylinder bank towards the other bank, pistons in said cylinders having piston rods extending from the inner ends of the cylinders, couplings connecting the
 25 piston rods of the opposed cylinders, links pivotally carried by said couplings and having swinging movement radially of said pivot post, a disk pivoted at its center to said post for universal rocking movement, stems
 30 extending from the periphery of said disk and pivotally connected with the free end portions of said links for universal movement, an operating rod rigid with and extending axially from the center of said disk,
 35 and a rotary drive having said operating rod eccentrically connected therewith for universal pivotal movement.

In testimony whereof I have hereunto affixed my signature.

BARNEY F. GILSON.