Oct. 2, 1928. 1,686,310

E. M. BEEBE

SLUSH PUMP MANIFOLD

Filed April 14, 1928

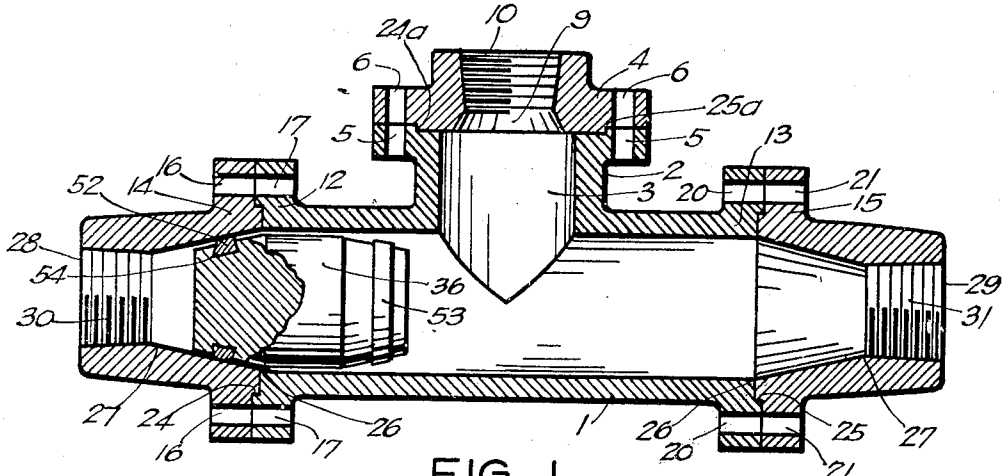


FIG. 1.

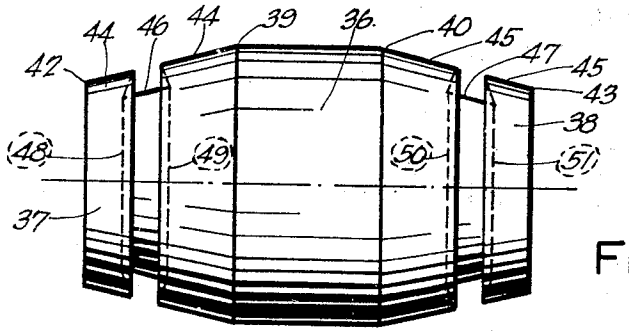


FIG. 2.

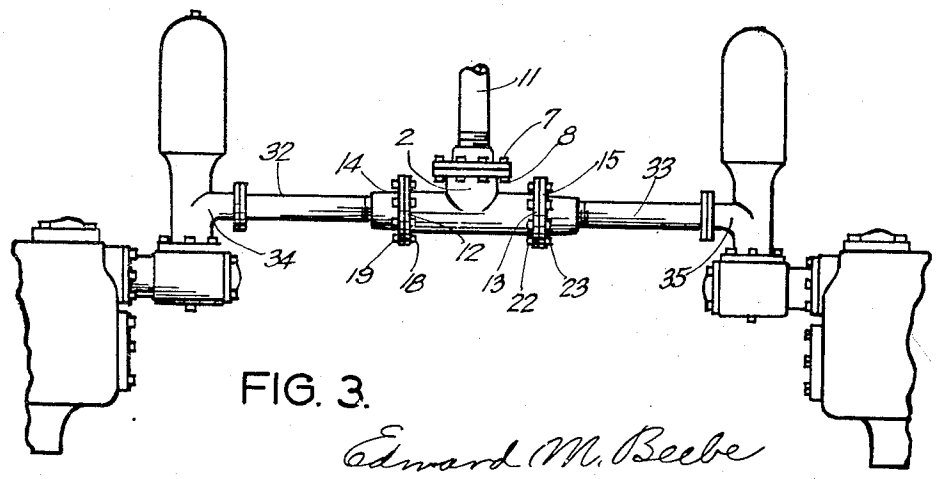


FIG. 3.

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EDWARD M. BEEBE, OF CUSHING, OKLAHOMA.

SLUSH-PUMP MANIFOLD.

Application filed April 14, 1928. Serial No. 270,080.

My invention relates to improvement in slush pump manifolds, particularly applicable for use in drilling oil and gas wells with what is known as rotary drills.

The objects of my invention are to produce a device of the class described which will be new, simple, novel, inexpensive, practical, efficient and of utility; which will automatically permit the shifting of one pump to another in the job in drilling with a rotary drilling outfit; which will prevent the necessity of the use of two or more expensive valves in connection with the drilling of such drilling outfit; which will be strong, durable and which will not easily get out of order; which is easily applied and attached and easily detached and changed; which will eliminate the use of gates now required in such drilling; which will include a double valve having both ends the same edge of which is adapted to fit into the valve seat another valve is introduced into the end adjacent the respective seat therefor; which eliminates a large number of parts required in former slush pump manifolds; which eliminates the valve seat shown in a separate piece at Figure 3 of the drawing in my former application for patent for improvement in slush manifolds, filed December 14, 1927, under Serial Number 239,-851; which eliminates the several separate parts of the double valve shown in Fig. 4 of said application just described making instead of them the double valve of one piece of metal each end of which is adapted to receive there surrounding a packing substance for contacting the respective valve seats; which provide standard pipe threading for the ends of the flanges for connection for other parts of the mechanism.

My invention consists of the novel features, construction and combination of parts hereinafter more fully described, illustrated in the accompanying one-sheet drawing, and pointed out in the appended claims; it being understood, however, that various changes may be made in the form, proportion, size, shape, weight and minor details of construction, within the scope of my invention without departing from the spirit and principle of the invention, or sacrificing any of the advantages thereof.

The invention and novel features will be further shown in the accompanying drawing, of which,

Figure 1 is a sectional view showing a part of the double valve member broken away; Fig. 2 is an elevational view the double valve with hydraulic packing removed; Fig. 3 is an elevational view showing the device attached to the discharge of two pumps.

Like characters of reference designate like parts in all the figures.

In the drilling of a well by a rotary drilling outfit where two alternating pumps are used, one of the essentials is a continuous and interrupted flow of water under pressure. This water is forced through the pipe and hose down the well through a rotating shaft to the rotating drill and out at the drill point into the casing whence it and the loose material produced by the drilling is carried to the surface and emptied into the basin or pond. The sediment settles, the water clears and is again ready for use in another cycle of operation. If an interruption in this process occurs the well or hole is exposed to much danger from caving in, closing up, and the like. All of these and other disadvantages are obviated by my invention. On December 14, 1927, under Serial Number 239,-851, I filed an application for patent under an improvement in slush pump manifolds. I desire this application to be considered as an improvement over and in connection with said application. I claim an improvement over said former application in that the valve seats contain a less number of parts and will cost less in manufacture and installation and take less time in installing and removing and the machined seat being in one piece will be stronger and less liable to get out of order. I also claim the double valve in this application being made of one piece of metal so far as the metal parts are concerned is an improvement over the double valve included in my former application in that it contains a less number of parts being more easily installed and removed and being less liable to get out of order and being less in the cost of its manufacture and installing and that it is more substantial and more lasting; also that the hydraulic packing is better positioned, more substantial, more lasting and much less liable to become loose and removed and get out of order.

I desire to have the drawing and these specifications to be considered as illustrative and not restrictive only. One embodiment of my invention may be described as follows:

I provide a longitudinal cylindrical body

1 having a central upstanding flange 2 being L-shaped, having a central bore 3 and having an L-shaped flanged member 4 thereabove for forming with said first flange 2 a union. Both of said members having conjugate perforations 5 and 6 and being adapted to be securely held together by bolts and nuts 7 and 8; said upper flange member 4 having a central bore 9 with its upper portion having standard threads 10 for seating a stand-pipe 11 thereabove. On each end of body member 1 is provided an L-shaped union 12, 13, being adapted to fit L-shaped flanged valve seat members 14 and 15, said flanged member 12 and said valve seat member 14 having conjugate perforations 16 and 17 therein for securely holding together by bolts and nuts 18 and 19 and said flanged member 13 and said valve seat member 15 having conjugate perforations 20 and 21 therein for securely holding them together by bolts and nuts 22 and 23. I prefer to have between said flanged portions 12 and 14, and said portions 13 and 15 cylindrical shoulders 24 and 25 for more securely holding said members together. I also prefer to have similar shoulders 24^a and 25^a between flanged members 2 and 4.

Said flanged valve seats 14 and 15 are preferably machined on their inside surfaces and taper from points 26 adjacent said shoulders 24 and 25 diminishing outwardly respectively therefrom to points 27, from said points 27 outwardly to their respective ends 28 and 29 they are standardly threaded 30 and 31. To these threaded end portions are connected pipes 32 and 33 connecting with slush pumps 34 and 35.

I also provide a double plug valve 36 substantially barrel-shaped, being formed of one piece of metal, preferably of steel. The end portions 37 and 38 from points 39 and 40 from approximately the distance of one third of the length of said member from each end to points 42 and 43 are tapered 44 and 45 diminishing from said points 39 and 40 respectively to points 42 and 43. Intermediate said points 39 and 42 and 40 and 43 I provide channels 46 and 47 encircling said barrel-shaped member the inner portions of said channels 46 and 47 being hollowed out internally on each side from their respective peripheries as indicated by dotted-in portions 48, 49 and 50, 51 for receiving and securely holding hydraulic packings 52 and 53. I also provide frustum-shaped hydraulic packings 52 and 53 for insertion within said channels 46 and 47 the wider dimension 54 thereof being adapted to be inserted against the inner surfaces of said channels, and are intended to entirely fill said channels including their wider dimensions as shown by said dotted-in portions 48, 49 and 50, 51. Said hydraulic packing members 52 and 53 are intended to extend slightly beyond the tapered surfaces 44 and 45 but not as far as points 39 and 40 on said surfaces. Any suitable hydraulic packing may be used. But I prefer to use a good grade of packing for such purpose.

In operation when my device is attached to the pipe in working position, and to the stand pipe, the pump is started. This has approximately a pressure of 500 pounds, or more. The water entering the body 1 of the device will immediately drive the valve 36 to the opposite end of the body 1 from that in which the water enters and the valve 36 will immediately close such opposite end; the hydraulic packing 52 and 53 around such end will be forced against the machined inside surface of the valve seat thereby closing the port adjacent thereto against egress of water, and the like, and the water will be forced through opening 3 in L-shaped flange 2 into stand-pipe 11, and thence into the hose, well, rotating shaft, etc., and out again. If the pump being used becomes disabled, or other interruption occurs, the other pump is then thrown into operation. The plug valve will then be driven to the opposite end of the device where it will be lodged in the tapered portion of the opposite valve seat. The flow of the water outwardly therethrough will be stopped and the liquid will then be forced through the same opening 3 thence into the stand-pipe, hose, well, rotating shaft, etc. and out again.

It will be observed by those familiar with the art to which my invention pertains that after the installation of my device the working thereof will be automatic. Also in case of the wearing of the hydraulic packing or of the valve seats by loosening the bolts and nuts and removing the valve seats new valve seats can be supplied and installed easily and new hydraulic packing can be easily and quickly installed on the double plug valve, both of which processes will be cheaply and quickly done without interferring with the operation of the drilling for any considerable length of time.

Having thus described the invention what is claimed and desired to be secured by Letters Patent is:

1. A slush pump double plug valve of the class described, comprising a barrel-shaped member having a central cylindrical portion, and having a portion between each of its ends and said central cylindrical portion oppositely tapered, each of said tapered portions having a channel therearound for receiving hydraulic packing for respectively seating removably in valve seats, hydraulic packing suitably fitting said channels and co-operating with said valve-seats, flanged valve seats being adapted to co-operate with a manifold, and to fit one at a time the tapering ends of said valve, said valve being adapted for longitudinal movement in said manifold and for closing the bore in one of said valve seats and permitting the other to remain open.

2. A device of the class described, comprising valve seat members adapted for connecting to each end of a manifold, said seats each having a tapered central bore for receiving one end at a time of a double plug valve, each of said seats having an outwardly extending bore standardly threaded for pipe connections, a double plug valve substantially of a barrel-shaped form, each end being tapered for fitting said valve seats, each tapered end having a channel therearound for holding a hydraulic packing, hydraulic packing members being adapted for seating in each of said channels and for fitting in said valve seats.

3. A device of the class described, comprising valve seats having flanged ends adapted for fastening to similar ends of a manifold, said valve seats having tapered bores opening into said manifold and standardly threaded bores for pipe connections, a double plug valve adapted to fit in said manifold and for longitudinal movement therein, having frusto-conical tapered ends for removably fitting one of said valve seats at a time, each of said tapered ends having intermediate its end a channel therearound for holding hydraulic packing, a hydraulic packing being adapted for positioning in said channels, said end valve and said hydraulic packing being adapted for fitting and closing said valve seats.

4. A device of the class described, comprising valve seat members having flanges adjacent one end for fastening to correspondingly flanged ends of a manifold, fastening means for holding them securely together, said valve seats having a tapered bore diminishing from the end adjacent the flange to a point substantially midway the length of said member, and having an opening extending therefrom being standardly threaded for pipe connection, a double plug valve being substantially barrel-shaped having its ends slightly tapered diminishing from its central third portion to each respective end, said tapered portion having intermediate its ends a channel therearound for receiving a hydraulic packing, hydraulic packings for seating in said channels, said valve portions being adapted for seating in said valve seats.

5. The combination with a manifold, of a device of the class described, comprising an automatically operating double plug valve, valve seats adapted for connecting the ends of said manifold, each having internal tapered bores opening into said body, their other ends having threaded openings for pipe connections, said double plug valve tapered ends, said ends having channels therearound for holding hydraulic packing, said valve ends being adapted for fitting and closing and opening said valve seats, said double plug valve being adapted for longitudinal movement in said manifold.

6. A device of the class described, valve seat members having flanges adjacent one end for fastening to corespondingly flanged ends of a manifold, fastening means for holding them securely together, said valve seats having a tapered bore diminishing from the end adjacent the flange to a point substantially midway the length of said member and having an opening extending therefrom being standardly threaded for pipe connection, a double plug valve being substantially barrel-shaped having its ends slightly tapered diminishing from its central third portion to each respective end, said tapered portion having intermediate its ends a channel therearound, said channel having a narrowed outer peripheral opening, said opening becoming wider as it recedes inwardly and being adapted for receiving a hydraulic packing, hydraulic packing for seating in said inwardly widening channels, said valve portions being adapted for seating in said valve seats.

EDWARD M. BEEBE.