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PUMP.

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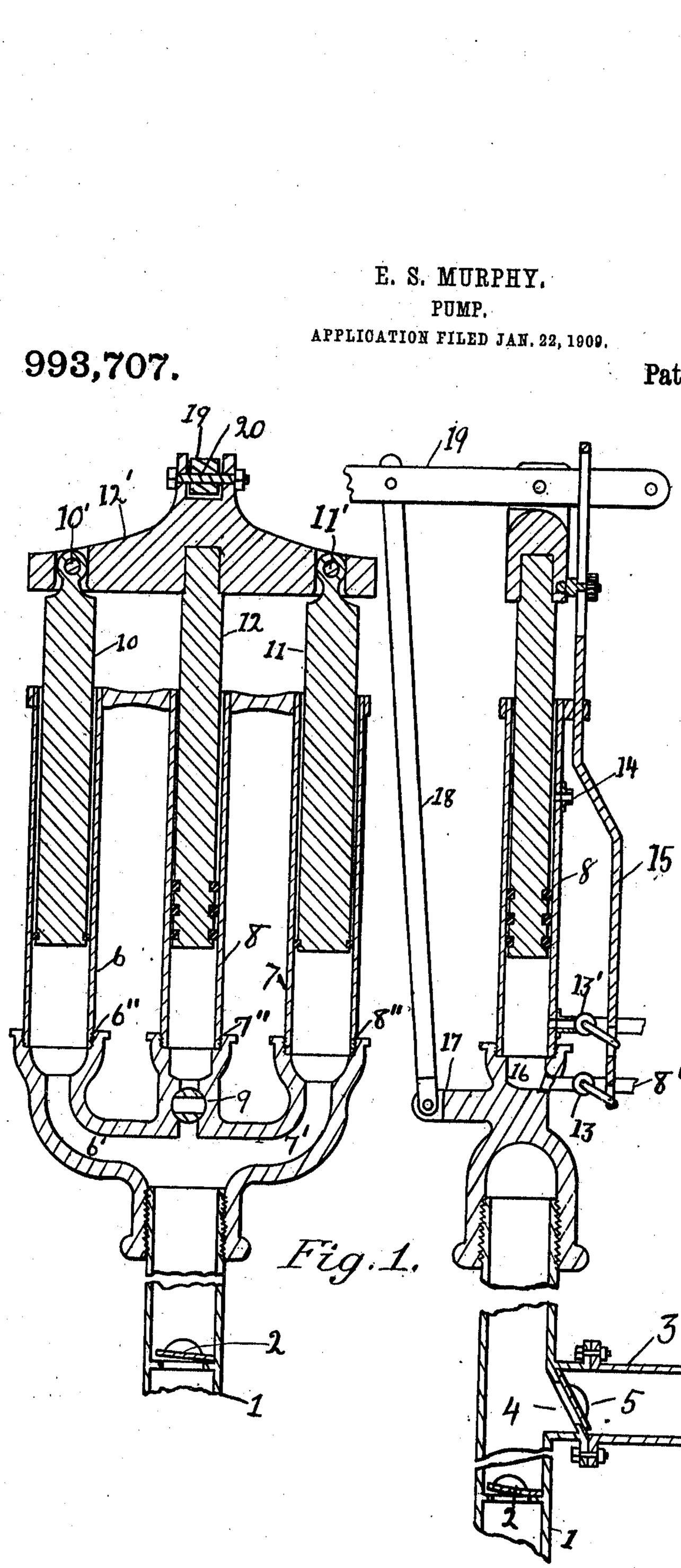

Fig. 1.

Fig. 2.

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To all whom it may concern:

Be it known that I, EDWARD S. MURPHY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented some certain new and useful Improvements in Pumps; and I do hereby 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 pertains to make and use the same.

My invention relates to pumps, and has reference more especially to that type of pump which is adapted to the wants of farmers, but may be utilized for other purposes.

The objects of my invention are, first, to provide a pump which is cheaply and economically constructed, requiring but a few parts and not requiring specially skilled labor to form or assemble the parts, or to repair the pump.

The second object of this invention is to provide a pump which may be interchangeably used either as a lift pump alone in connection with a steam cylinder and piston, or as a force pump in connection with a hand lever or handle, or if necessary an auxiliary motor, either steam, gasolene, or other.

Other objects of the invention will appear as the description is proceeded with.

My invention consists in combining in a pump, a centrally located cylinder and piston, which forms the motive power in connection with suitable motor medium for raising two suction pistons operating in cylinders, located parallel with the central or motor cylinder, and working in unison with said motive power.

My invention further consists in providing three or more cylinders in juxtaposition to each other, one of said cylinders being adapted to be changed from a motive power to a suction action, or in other words, interchangeably as means for imparting motion to the pump, or as a means for raising and forcing the water.

This invention further consists in other details of construction, all of which will be hereinafter fully set forth and claimed.

In the drawings, Figure I, is a vertical longitudinal section taken through the pump, designed to embody my invention, and Fig. II, is a vertical cross-sectional view taken through the same. In both these views, Fig. I, and Fig. II, the main suction pipe or well pipe is shown divided in order to more clearly show the operation of the parts and their relative position to each other.

1, represents the main suction pipe or well pipe, which is of suitable length to reach beneath the water level of the well or other source of water supply. This pipe 1, is supplied with one or more upwardly opening valves 2, of any suitable construction, adapted to close upon downward pressure and to open upon upward suction or pressure. The diameter of the pipe 1, is sufficient to supply the necessary amount of water to the suction pumps or cylinders, and may be made of any suitable material, metal being deemed preferable.

Intermediate between the pipe 1, at its upper end and the pumping mechanism, is a spout 3, communicating with the interior of the pipe 1. At the communicating orifice 4, is provided a valve 5, of suitable construction adapted to close when suction is exerted, and to open to allow the water to pass through the spout 3, or to be forced therethrough, according to the action of the pump. For the sake of convenience I have shown the spout 3, secured by a flange union to the main pipe 1, in order that access may be had by the valve 5, but I do not deem this absolutely essential inasmuch as other manners of securing the spout and constructing the valve may be employed. I have also shown the spout 3, provided with a plain open mouth at its delivery orifice, but, in constructing the same, I may, and probably will desire to, provide this end with a screw thread or other suitable coupling for the attachment of a hose.

Mounted upon the upper end of the pipe 1, above the spout 3, is the pumping mechanism, which comprises preferably three cylinders 6, 7 and 8; cylinders 6, and 7, normally communicating through conduits 6′ and 7′ with the interior of the suction pipe 1, and the cylinder 8, being connected as shown in Fig. II, with the steam supply 8′, which leads to any boiler or means of supply for motive medium. This cylinder 8, however can be made to communi-

cate with the supply pipe 1, by means of a valve 9, as will be hereinafter explained, it being understood that this valve 9, normally closes against communication when the pump is operated by means of the motive medium such as steam, gas or air. The three cylinders 6, 7 and 8, are provided with pistons 10, 11, and 12, which snugly fit the interior of their respective cylinders and are adapted to operate therein. These pistons 10, 11 and 12 may be provided, and preferably are provided with suitable packing as illustrated, in order to provide a tighter joint between them and the interior of their respective cylinders.

I will now proceed to describe the pump as it is operated through the medium of the motive medium: Steam, air or gas under pressure being admitted through the pipe 8′ to the lower end of the cylinder 8, the valve 13, being open, the piston 12, is raised in the cylinder 8, and with it the two pistons 10 and 11, are raised in their respective cylinders, inasmuch as the piston 12, is connected to the pistons 10, and 11, by means of a suitable connection, such as a cross-head 12′. This action of the piston 12, creates a suction in the cylinders 6 and 7, opening the valve 2, and intermediate valves if any are provided, and causing the water to rise in the pipe 1, until the pipe 1, is filled above the spout 3, to any extent, depending upon the height or distance of the movement of the pistons. When the piston 12 has reached the desired height, say approximately, above the safety exhaust 14, the pistons are stopped, meanwhile the valve rod or bar 15, has been raised so as to close the valve 13, and open the exhaust valve 13′; this allows the piston 12, to descend, and with it the pistons 10 and 11, the weight of said pistons severally in connection with the cross-head 12′, being weight enough to return the pistons to their lower position, and in so doing to cause the valve rod 15, to open the valve 13, of the supply pipe 8′, and to close the exhaust valve 13′, when the action as above described is repeated and may be continuous acting as long as force is supplied through the pipe 8′.

It will be seen from the above that both the construction and action of the pump is simple inasmuch as for the cylinders 6, 7 and 8, the requirements are that any suitable pipe having smooth and uniform bore may be employed, and that the pistons 10, 11 and 12 being formed solid, may be either cast or formed of suitable rod of diameter corresponding with the interior of cylinders 6, 7 and 8, respectively; a suitable packing at the lower end of said pistons providing a tight joint. The pistons 10, 11, and 12, are united together by a cross-head 12′, as above set forth, and act together, but for the purpose of providing for any inaccuracy in alinement, I secure the pistons 10 and 11, to the cross-head 12′ by pivotal connections as shown at 10′ and 11′. The lower ends of the cylinders 6, 7 and 8, are preferably secured to a "foot" comprising three socket parts 6″, 7″ and 8″, these sockets being preferably screwthreaded interiorly to receive the lower ends of their respective cylinders. The socket 7″ provides a chamber 16 which acts as a steam chamber or cushion chamber for the piston 12 and cylinder 8, and into which leads the supply pipe 8′.

When it is desired to employ the pump as a hand or force pump, I provide means such as a bracket 17, brace rod 18, and handle 19, the handle 19, being pivotally secured as at 20, to the cross-head 12′. Thus it will be seen that the pistons 10, 11, and 12, may be operated through the medium of the handle 19, and in order to allow for this, and also in addition to allow the piston 12 in its cylinder 8, to co-act with the pistons 10 and 11, I provide a valve 9, which by turning allows communication between the cylinder 8, and the suction or supply pipe 1, bringing the three pistons with their respective cylinders into action as a suction and force pump, which is valuable from the standpoint that in case of fire, or where it is desired to force the water any distance, the handle 19, may be brought into action, and by turning the valve 9, three cylinders and pistons for suction force are provided.

In setting forth this invention I have shown certain details of construction and assemblage of parts, but I do not wish to be limited to these, inasmuch as they may be modified without departing from the invention. Such, for instance, as the handle 19, may be lengthened outwardly beyond its pivotal point 20, as illustrated in Fig. II, to provide means for attaching the rod of a deep well pump as suggested, and other alterations may be made.

What I claim is:

1. A pump of the type set forth comprising three cylinders, three weighted pistons operating in said cylinders, both pistons and cylinders being vertically arranged; the central of said cylinders and pistons being adapted to operate as the motive power for the other cylinders whereby the last mentioned cylinders operate to pump; means attaching the upper ends of all pistons so that they will operate in unison; means for operating all of said pistons in the cylinders secured to the upper end of said pistons and valves located at the lower portion of the central cylinder adapted to turn on or off the motive power to said cylinder and to turn on or off the communication between said cylinder and the water supply.

2. A pump of the type set forth comprising three cylinders with pistons operating therein, the central of said cylinders in con-

nection with its piston adapted to be operated by a motive power; a valve connecting said cylinder with the motive power and an independent valve located in the lower end of said cylinder adapted to connect it to the water supply so that all three cylinders may be utilized as pumping cylinders.

Signed at Cleveland in the county of Cuyahoga and State of Ohio, this 1st day of December, 1908.

EDWARD S. MURPHY.

Witnesses:
J. J. DONNELLY,
ANNA M. OHLIGER.