(No Model.)

J. RICHARDS.

CENTRIFUGAL PUMP.

No. 359,097. Patented Mar. 8, 1887.

Fig. 1.

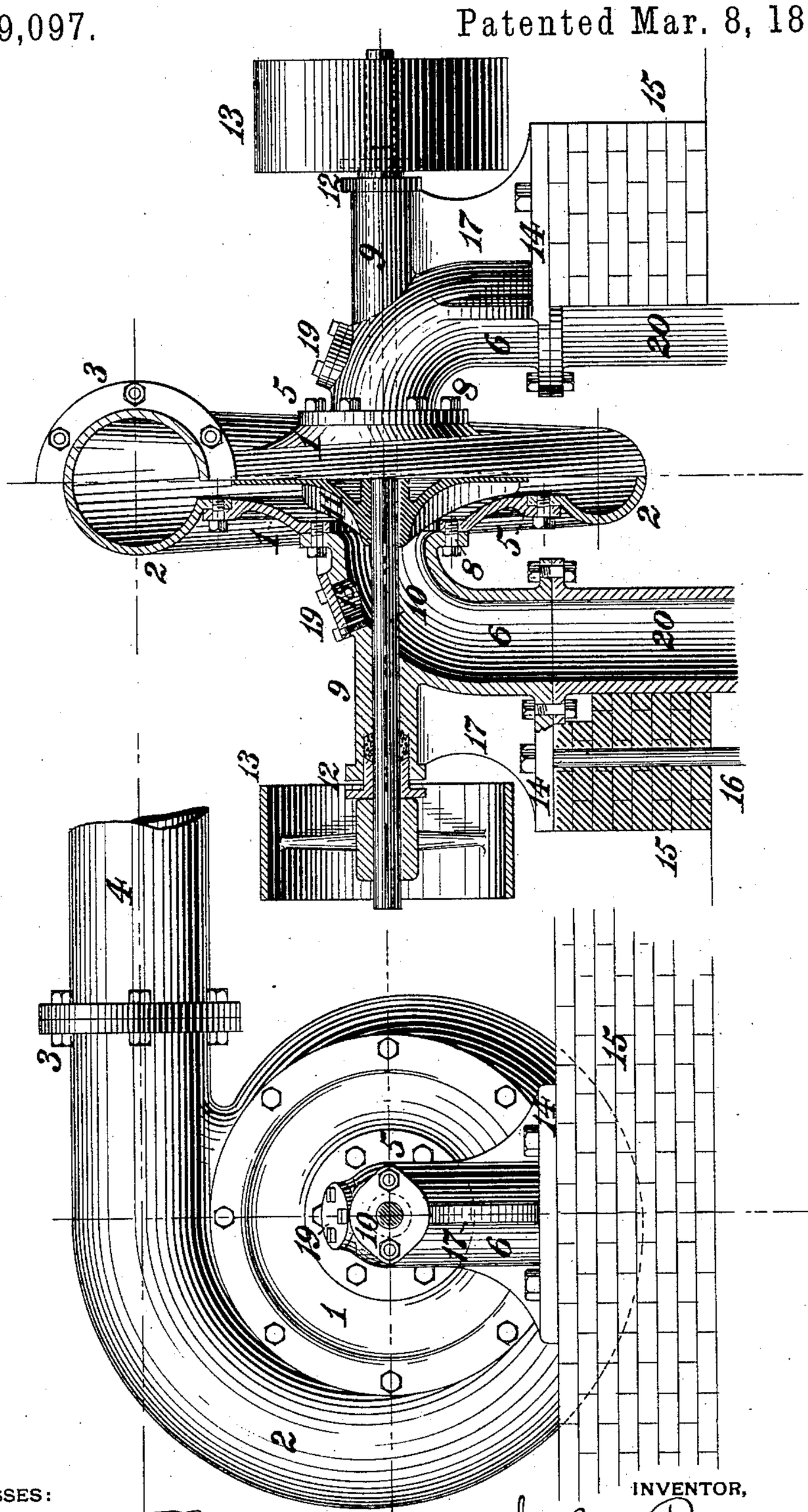

Fig. 2.

WITNESSES:

S. Thordsen Pell.
C. M. Clarke.

INVENTOR,

John Richards,
George H. Christy Att'y.

UNITED STATES PATENT OFFICE.

JOHN RICHARDS, OF SAN FRANCISCO, CALIFORNIA.

CENTRIFUGAL PUMP.

SPECIFICATION forming part of Letters Patent No. 359,097, dated March 8, 1887.

Application filed April 27, 1886. Serial No. 200,300. (No model.)

To all whom it may concern:

Be it known that I, JOHN RICHARDS, residing at San Francisco, in the county of San Francisco and State of California, a citizen of the United States, have invented or discovered a certain new and useful Improvement in Centrifugal Pumps, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is an end view, partly in elevation and partly in section, of a centrifugal pump embodying my invention; and Fig. 2, a side view, in elevation, of the same.

The object of my invention is to simplify and economize the construction of centrifugal pumping apparatus of the class in which the wheel or runner rotates upon a horizontal shaft by enabling the main casing and spindle-bearings to be supported without the employment of a special or independent frame, as well as to provide for locating the discharge-nozzle of the pump in any desired position relatively to the axial plane of the spindle.

To this end my invention, generally stated, consists in the combination of a pair of suction-pipes, each having an upper spindle-bearing and a lower lateral supporting-flange, and a main casing interposed between and connected to the adjacent faces of the suction-pipes.

The improvement claimed is hereinafter fully set forth.

In the practice of my invention I provide a main casing, 1, having a peripheral volute discharge-passage, 2, terminating in a flanged discharge-nozzle, 3, for the connection of the discharge or delivery pipe 4. A central opening is formed in each side of the casing, said openings being faced off truly to abut against flanges 5 on the upper ends of two lateral suction-pipes, 6, to which the interposed main casing is secured by bolts 8. A bearing, 9, is formed in the upper portion of each of the suction-pipes 6 to support the journals of the shaft or spindle 10, upon which the wheel or runner 11 of the pump is fixed, said shaft projecting outwardly through properly-packed stuffing-boxes 12 at the ends of the bearings and carrying pulleys 13, through which the shaft and runner are rotated by power transmitted from a suitable prime mover. The suction-pipes 6 are turned into vertical position below the bearings 9, and at their lower ends are provided with substantial lateral flanges 14, which serve as bed-plates to support the entire weight of the pump upon a suitable foundation, 15, to which they are connected by holding-down bolts 16. Vertical webs 17, extending from the flanges 14 to the bearings 9, serve to impart additional strength and rigidity to the latter. Openings 18, closed by removable lids or bonnets 19, are formed in the upper portions of the suction-pipes to enable access to be had to the interior of the pump for the removal of obstructions when desired. Additional sections 20, connected to the lower ends of the suction-pipes, extend to such depth below the same as may be required by the level of the liquid to be raised by the pump.

It will be seen that by the above construction the weight of the entire structure is transmitted through the suction-pipes directly to the foundation, and the special supporting-frames heretofore required are wholly dispensed with, thus providing a correspondingly simpler and more compact apparatus. A further advantage is attained in the capacity of turning the main casing between the connecting-flanges of the suction-pipes, so that the discharge-nozzle can be set either horizontally, vertically, or at any desired angle considered necessary or desirable.

I claim herein as my invention—

In a centrifugal pump, the combination of a frame composed of a pair of suction-pipes, each having an upper spindle-bearing, a flange extending laterally from its lower end in position to serve as a bed-plate or support, and a flange on its lower end for the direct connection of an independent additional section, and a main or runner casing interposed between and bolted to the upper ends of the suction-pipes independently of the foundation to which the same are secured, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN RICHARDS.

Witnesses:
J. SNOWDEN BELL,
R. H. WHITTLESEY.