

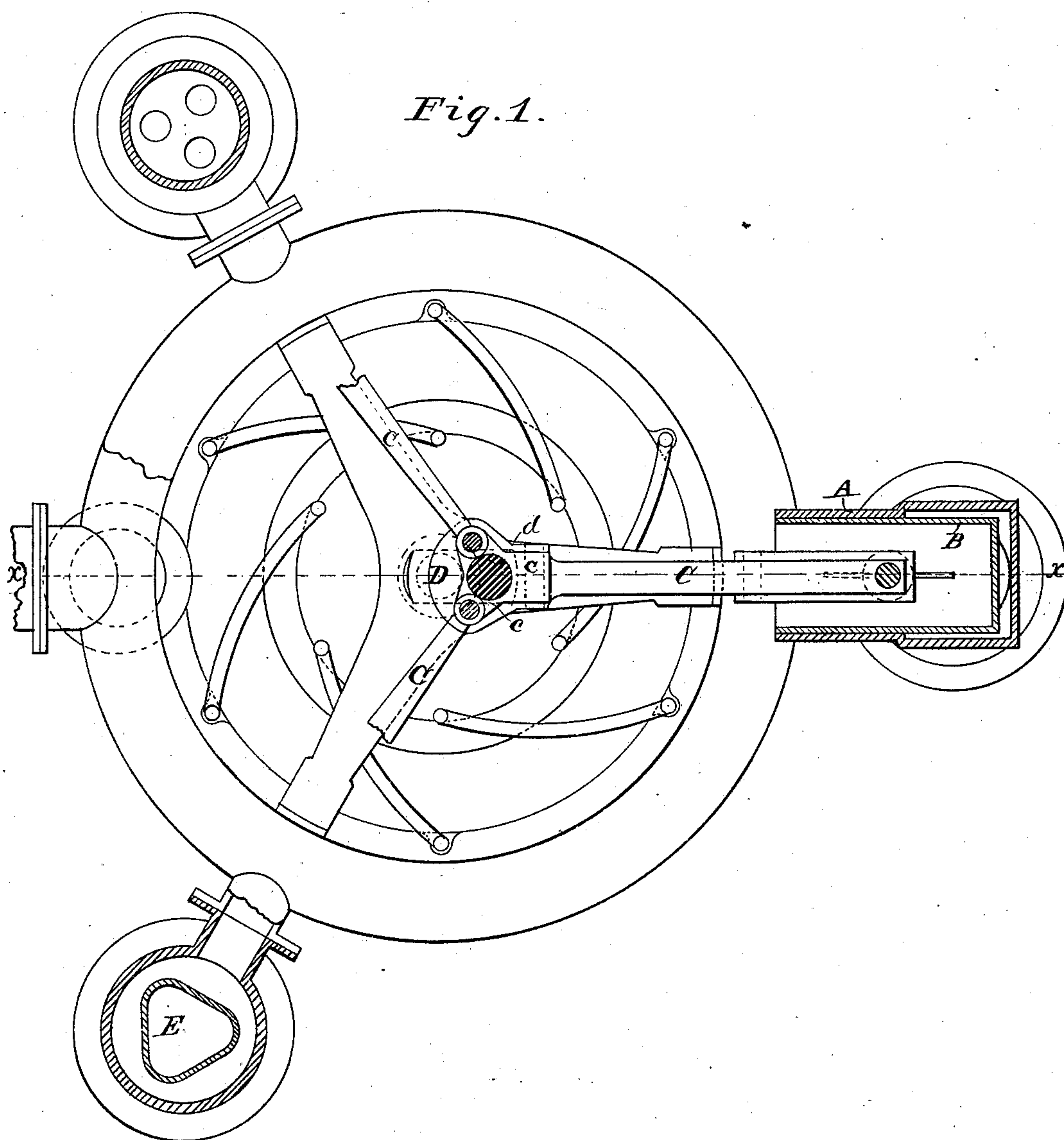
(No Model.)

2 Sheets—Sheet 1.

J. WATERS.  
PUMPING ENGINE.

No. 279,679.

Patented June 19, 1883.



Witnesses:  
E. J. Walker  
A. M. Lons.

Inventor.  
James Waters  
by his attorney  
J. E. Hill

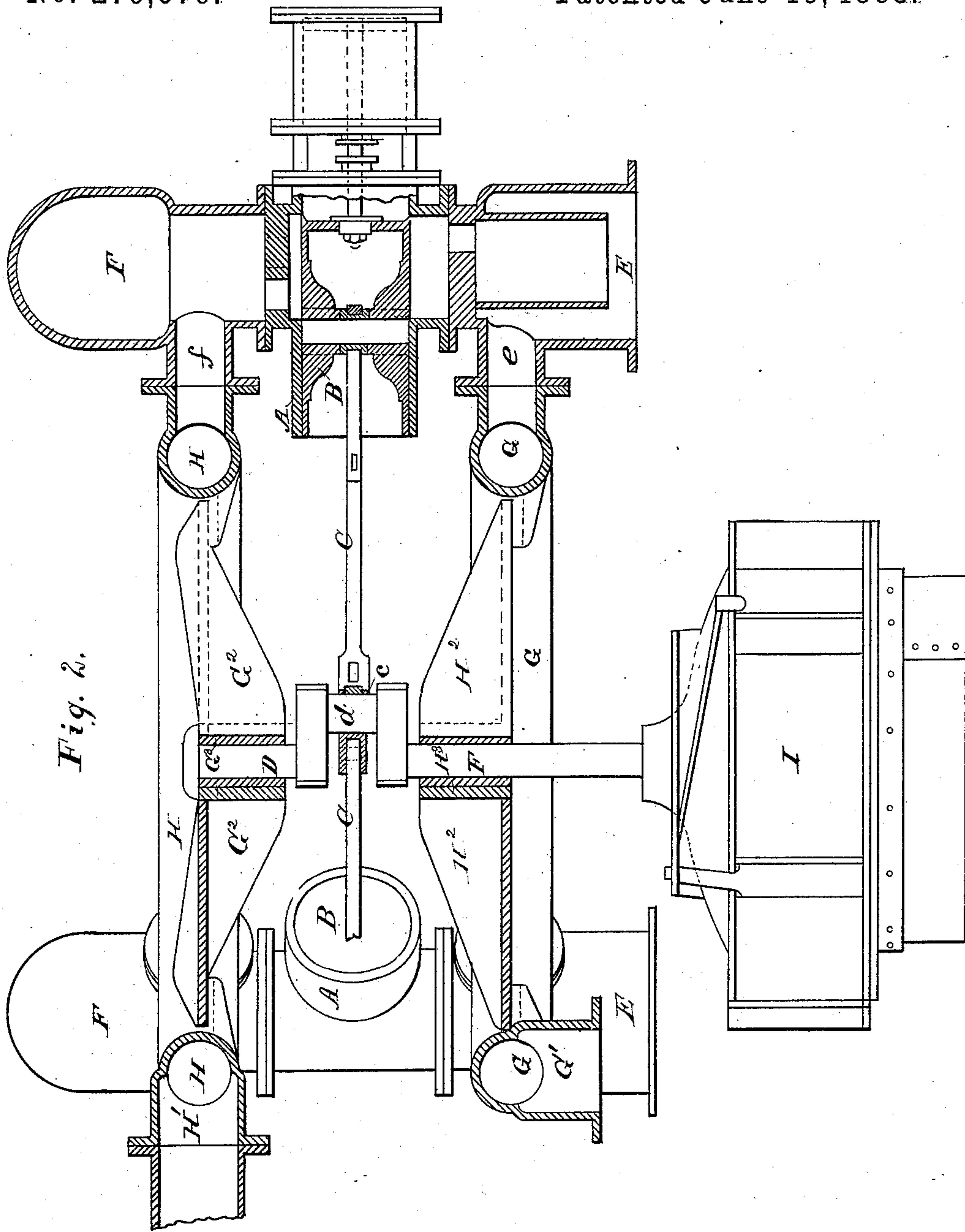
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# UNITED STATES PATENT OFFICE.

JAMES WATERS, OF MINNEAPOLIS, MINNESOTA.

## PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 279,679, dated June 19, 1883.

Application filed December 15, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES WATERS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Pumping-Engines; 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 appertains to make and use the same.

This invention relates to a pumping-engine composed of three or more barrels arranged radially around an upright shaft, to a crank of which all the plungers are connected. Heretofore it has been customary to drive such upright shaft by means of a turbine water-wheel or other motor through the intervention of gearing. Such a combination is obnoxious to many objections, principal among which are the following, namely: The plant requires a comparatively large space—a serious item of expense where property is valuable—and the connecting machinery is cumbersome, noisy, liable to derangement, and expensive.

One object of my invention is to overcome these and other objections.

To this end my improvement consists in mounting the pumps directly over a turbine water-wheel, so that the crank-shaft of the pumps may either constitute the top end of the water-wheel shaft or be coupled directly thereto.

My improvement further consists in connecting the several pumps by two continuous preferably circular pipes, one of which serves as a common suction-pipe, the other as a common discharge-pipe, and both together as a framework for connecting the pumps and giving support to the crank-shaft.

In order that my invention may be clearly understood, I have illustrated it in the annexed drawings, and will proceed to describe the best form thereof at present known to me.

Figure 1 is a plan view of a pumping-engine constructed in accordance with my invention and driven by a turbine water-wheel, some parts being shown in section. Fig. 2 is a vertical section thereof on line *x x* of Fig. 1, a steam-cylinder being shown attached to one of the pump-barrels to indicate the mode of operating the pumps by steam-engines.

The same letters of reference indicate identical parts in all the figures.

The pumps may be of the form shown or of any other preferred construction. In the example illustrated the barrels *A A A* are open at the inner end, and are provided with hollow plungers *B B B*, pivoted to the connecting-rods *C C C*. One of these connecting-rods is connected with a head, *c*, attached to the crank *d* of the central upright crank-shaft, *D*. The other connecting-rods are pivoted at their inner ends to the head *c* of the first connecting-rod, so that all the rods will be operated by the crank *d*. To the lower side of each pump-barrel a vacuum-chamber, *E*, is connected, the opening or openings of communication between which and the pump-barrel will be controlled by a suitable valve. (Not shown.) The vacuum-chambers are constructed with lateral branches *e*. An air-chamber, *F*, is mounted upon the upper side of each pump-barrel, and any ordinary discharge-valve (not shown) will be used to control the opening or openings of communication between the pump-barrel and the air-chamber. Each air-chamber is constructed with a lateral branch, *f*. The branches *e* are all connected to corresponding lateral branches on the common suction-pipe *G*, which is preferably of circular form, as shown, though that particular form is not essential. This suction-pipe is provided with an extra branch, *G'*, for the attachment of the pipe through which the water is drawn up. The branches *f* of the air-chambers are similarly connected to corresponding branches of the common discharge-pipe, *H*, also preferably of circular form, and provided with an extra branch, *H'*, for the attachment of the distributing-main. The pipes *G* and *H*, being located, respectively, above and below the crank *d*, are constructed with spider-arms *G<sup>2</sup>* and *H<sup>2</sup>*, terminating in central hubs, *G<sup>3</sup>* and *H<sup>3</sup>*, bored and boxed to form bearings for the crank-shaft on each side and close to the crank thereof.

The pumps may have a construction different from that shown and described; but in every case the crank-shaft *D* thereof is to be an upright one, in order that by mounting the pumps directly above a turbine water-wheel, I, said crank-shaft may be in line with shaft *K*



of said water-wheel, and either constitute the upper end thereof, as shown, or be suitably coupled thereto.

My improvement relating to the structure of the pumping-engine may be used without the other improvement described. The pumps may, for instance, be driven by steam. In that case I prefer to attach a steam-engine to each pump, substantially as shown on one of the pumps in Fig. 2, the piston-rod of the steam-engine being directly secured to the pump-plunger, all the plungers remaining connected to a common central crank-shaft.

My improved pumping-engine is more especially designed for water-works for supplying cities and towns with water, but may be advantageously used in private establishments and for general purposes.

Having thus described my invention, what I claim is—

1. The combination, substantially as before set forth, of a series of pumps, the barrels of

which are arranged radially around a common center, a vertical crank-shaft for driving the plungers of the several pumps, and a turbine water-wheel on the upper end of the shaft of which said crank-shaft is an extension.

2. The combination, substantially as before set forth, of a series of pumps, the barrels of which are arranged radially around a common center, the central crank-shaft to which all the plungers are connected, the continuous common suction-pipe, and the continuous common discharge-pipe, said pipes being constructed with spider-webs and central bearings, so as to serve as a frame-work for connecting the pumps and supporting the crank-shaft.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES WATERS.

Witnesses:

J. H. COOK,

H. O. HAMLIN.