2 Sheets—Sheet 1.

# C. C. BIRUM.

## ROTARY FORCE PUMP.

Patented Dec. 5, 1876.

No. 185,069.

Fig. 1.

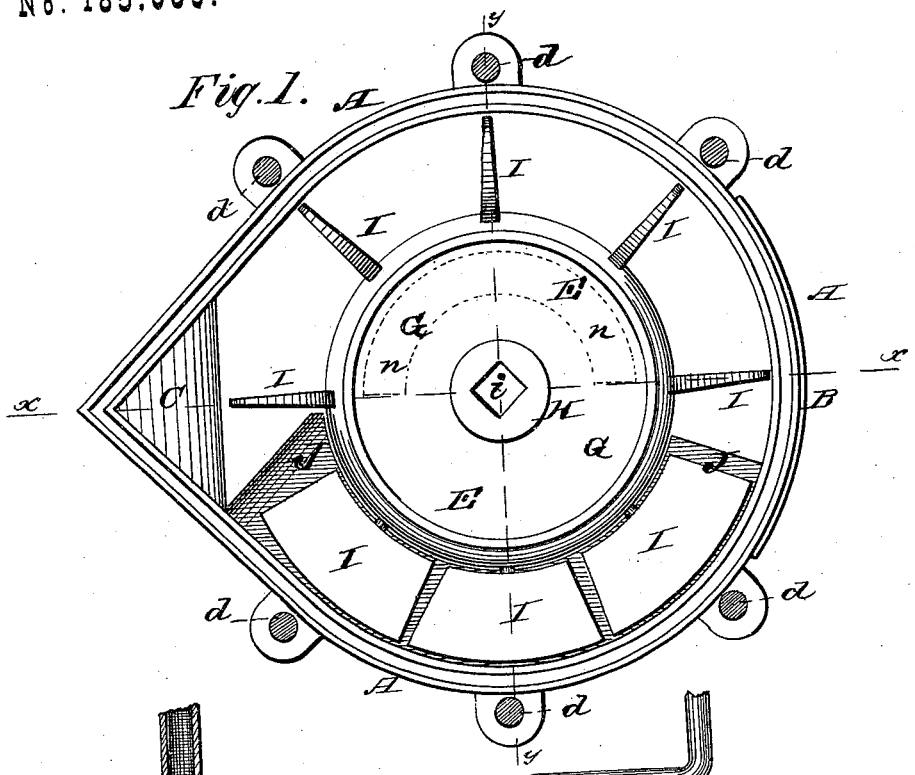
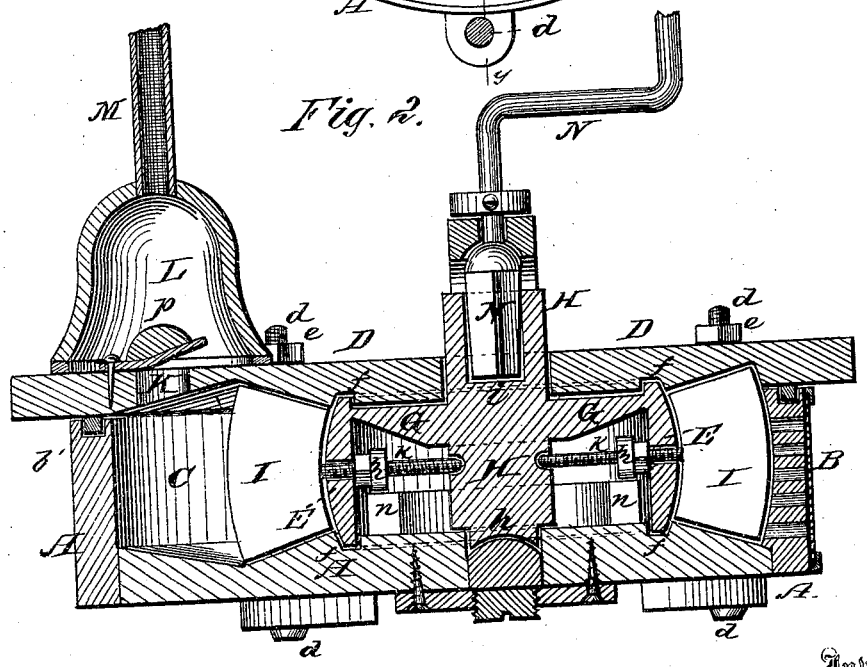



Fig. 2.




Witnesses:

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Wm. Ruppenman.

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Per: C. H. Watson & Co. Attorneys

2 Sheets—Sheet 2.

# C. C. BIRUM.

## ROTARY FORCE PUMP.

No. 185,069. Patented Dec. 5, 1876.

Fig. 3.

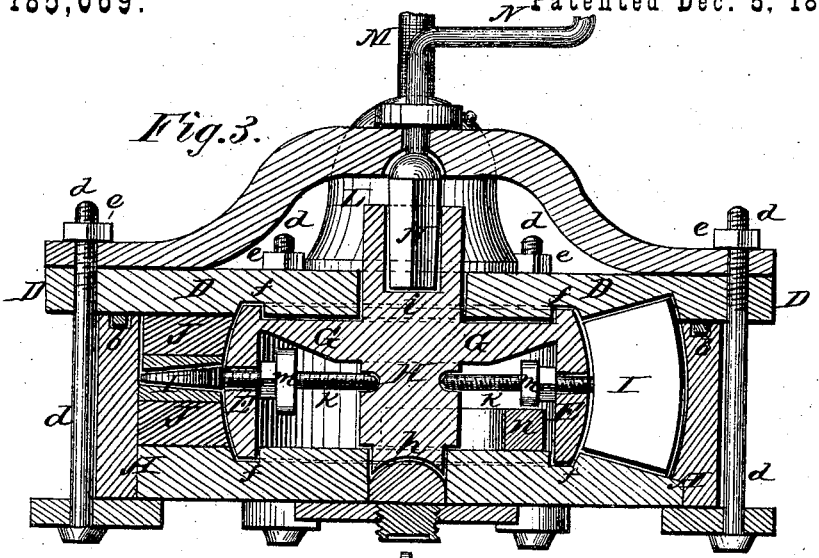



Fig. 4.

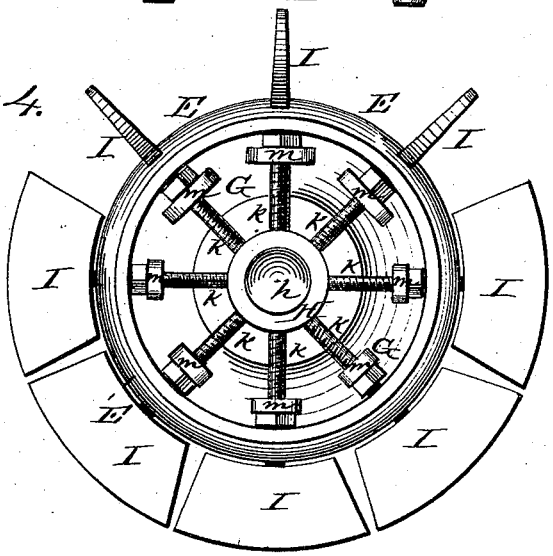
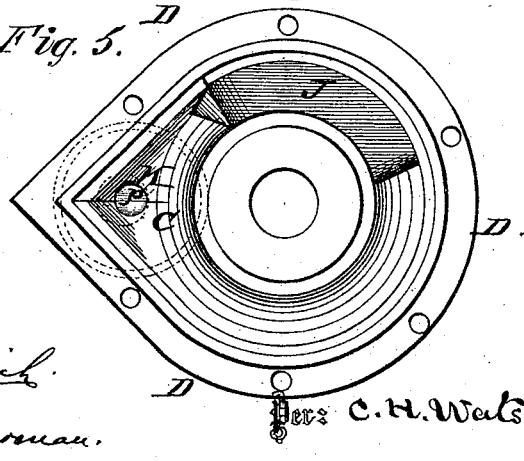



Fig. 5.




Witnesses:
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# UNITED STATES PATENT OFFICE.

CARLUS C. BIRUM, OF REDWOOD FALLS, MINNESOTA.

## IMPROVEMENT IN ROTARY FORCE-PUMPS.

Specification forming part of Letters Patent No. **185,069**, dated December 5, 1876; application filed June 9, 1876.

*To all whom it may concern:*

Be it known that I, CARLUS C. BIRUM, of Redwood Falls, in the county of Redwood and State of Minnesota, have invented certain new and useful Improvements in Force-Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in the construction and arrangement of what I term a "turbine force-pump," as will be hereinafter more fully set forth.

In the annexed drawing, Figure 1 is a plan view with cover removed. Fig. 2 is a central vertical section on line *x x*, Fig. 1. Fig. 3 is a transverse vertical section on line *y y*, Fig. 1. Fig. 4 is an inverted view of the wheel, and Fig. 5 is an inverted view of the cover.

A represents the box or case of my force-pump, having on one side the water-inlet with filter B. The case is made of circular or cylindrical form, except at a point opposite the filter, where it runs out to a point, forming a chamber, C. D is the cover of the box, made to correspond with it in shape, and has a packing-flange, *b*, entering a groove in the edge of the sides of the case, to make a water-tight joint. The cover is held on the case by bolts *d* and nuts *e*, the bolts passing through ears on the case and cover, as shown. Within the case or box is placed a wheel, composed of a circular rim, E, made convex on its outer surface, and having its edges fitting in grooves *f f*, made in the bottom and cover of the case. Near the top of the rim is a plate, G, closing the same, said plate being formed with a central hub, H, extending above and below the same, as shown.

The rim, plate, and hub are all cast in one piece. The lower end of the hub is formed with a journal, *h*, which rests in a step or socket in the bottom of the case; and the upper end of the hub passes through the cover D, and is formed with a socket, *i*, for the attachment of the operating-shaft. On the outer side of the wheel thus formed is a series of paddles, I I, each attached to a stem, *k*, which passes through the rim and enters the hub radially. On each stem *k*, inside of the wheel, is a cross-bar, *m*, standing at right angles with the paddle, whereby each paddle moves independently of the others. On the bottom of the case A, within the wheel, is a semicircular raised flange, *n*, extending from opposite the entrance B to opposite the chamber C. Outside of the wheel, on the other side, are rests J J, attached to the bottom and cover of the case, with a sufficient space between them to allow the paddles to pass through in a horizontal position.

As the wheel revolves, each paddle is in succession turned in a vertical position by its cross-bar *m* striking the end of the flange *n* opposite the inlet, and thus the paddle will remain and drive the water before it into the chamber C, and out through the outlet K in the cover. Here the lower end of the paddle comes in contact with the lower rest J, and is thereby turned in a horizontal position, and in that position passes between the rests.

On top of the cover, over the outlet K, is a chamber, L, with valve *p*, and from the top of the chamber extends a pipe, M, to which the hose is to be attached. N is the driving-shaft, inserted in the socket *i* of the hub.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The rotating wheel E G H, provided with the independently-moving paddles I, secured upon radial stems *k*, and each stem provided with a cross-bar, *m*, substantially as and for the purposes herein set forth.

2. The case A D, provided with grooves *f f*, flange *n*, rests J J, inlet B, and chamber C, with outlet K, in combination with the wheel and its paddles, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CARLUS C. BIRUM.

Witnesses:

M. E. POWELL,

D. W. MOORE.