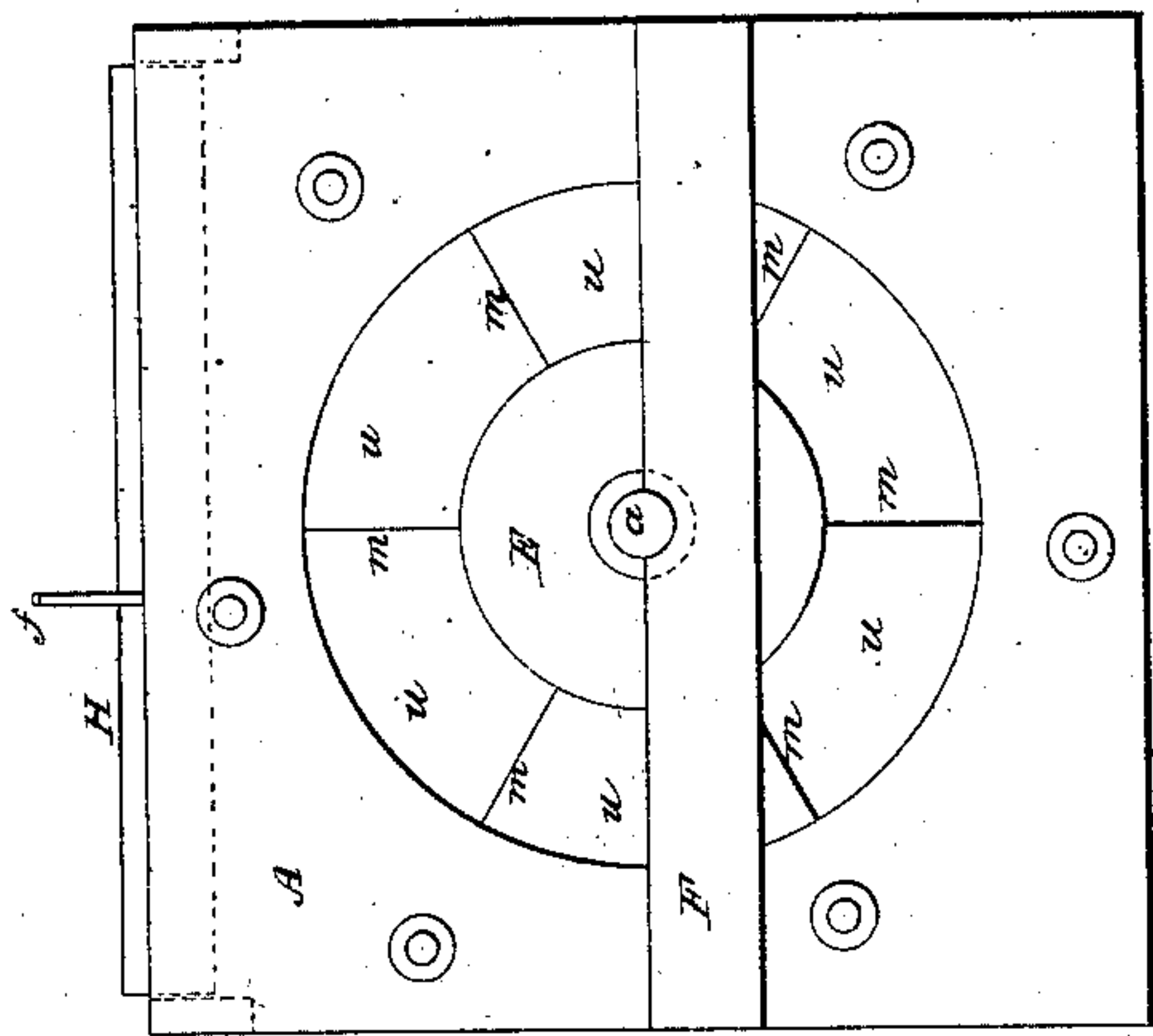


*R. Chapman*

*Water Wheel,*

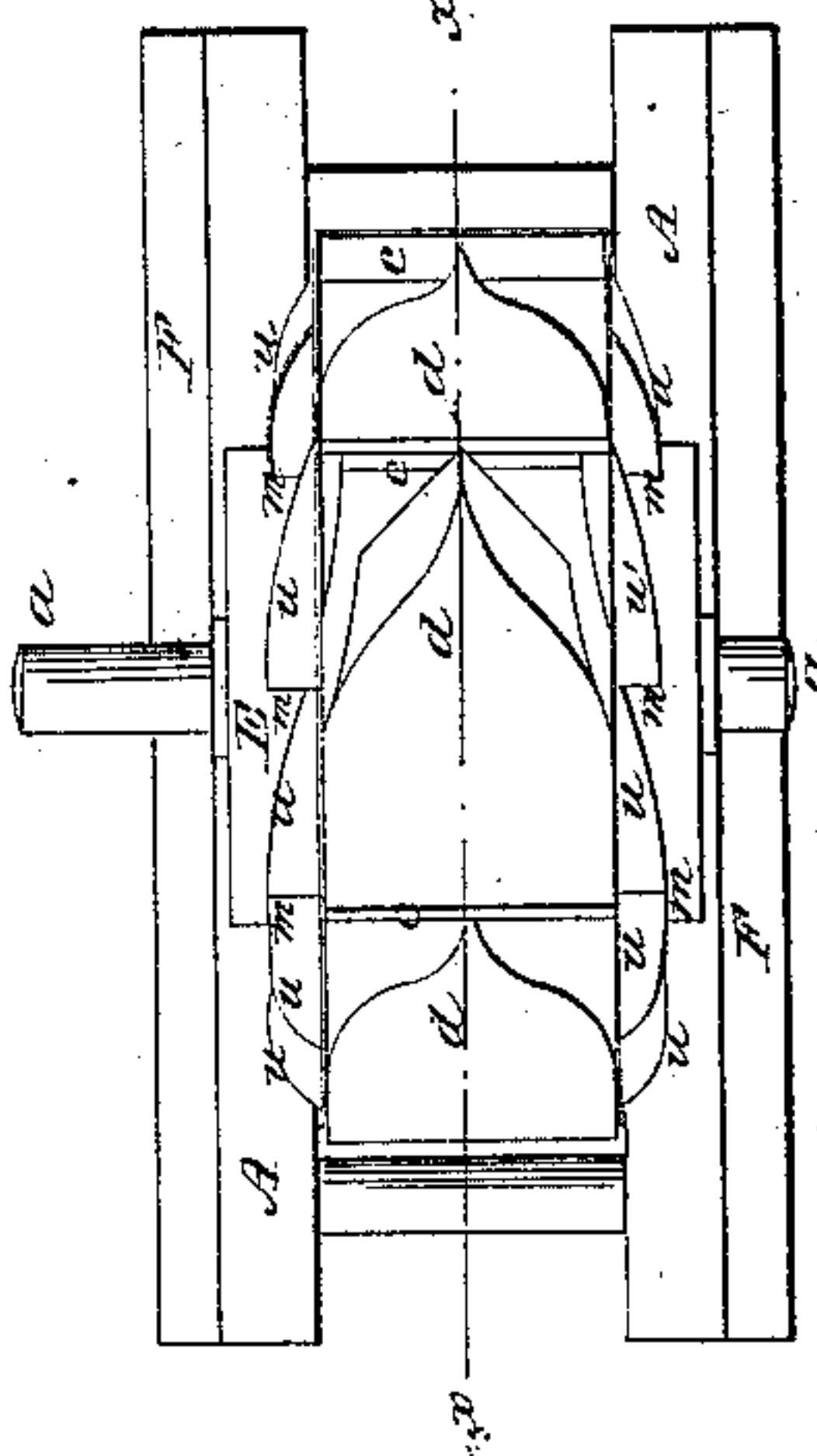
*N<sup>o</sup> 62,473.*

*Patented Feb. 26, 1867.*



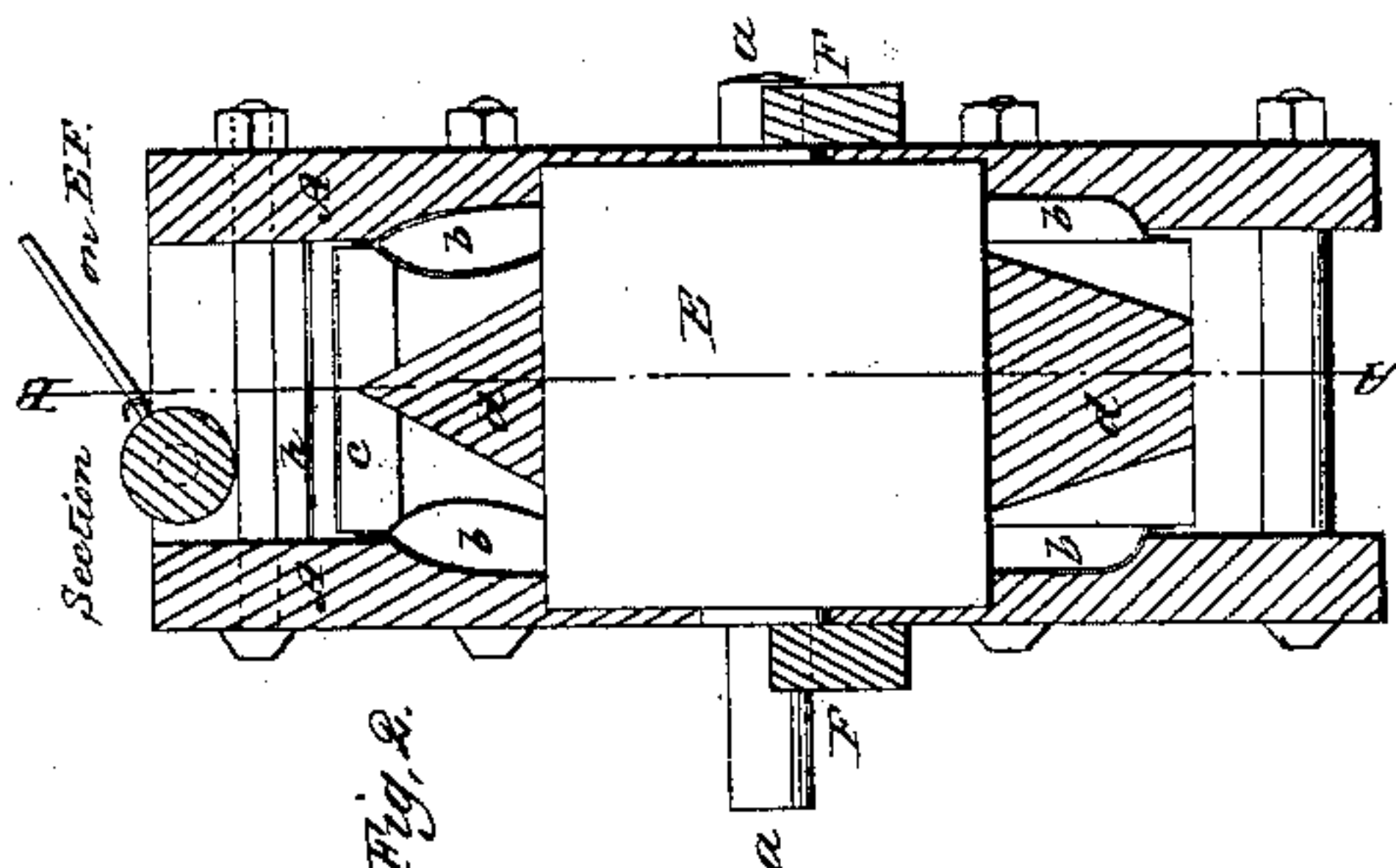
*Fig. 3.*

*Side Elevation.*



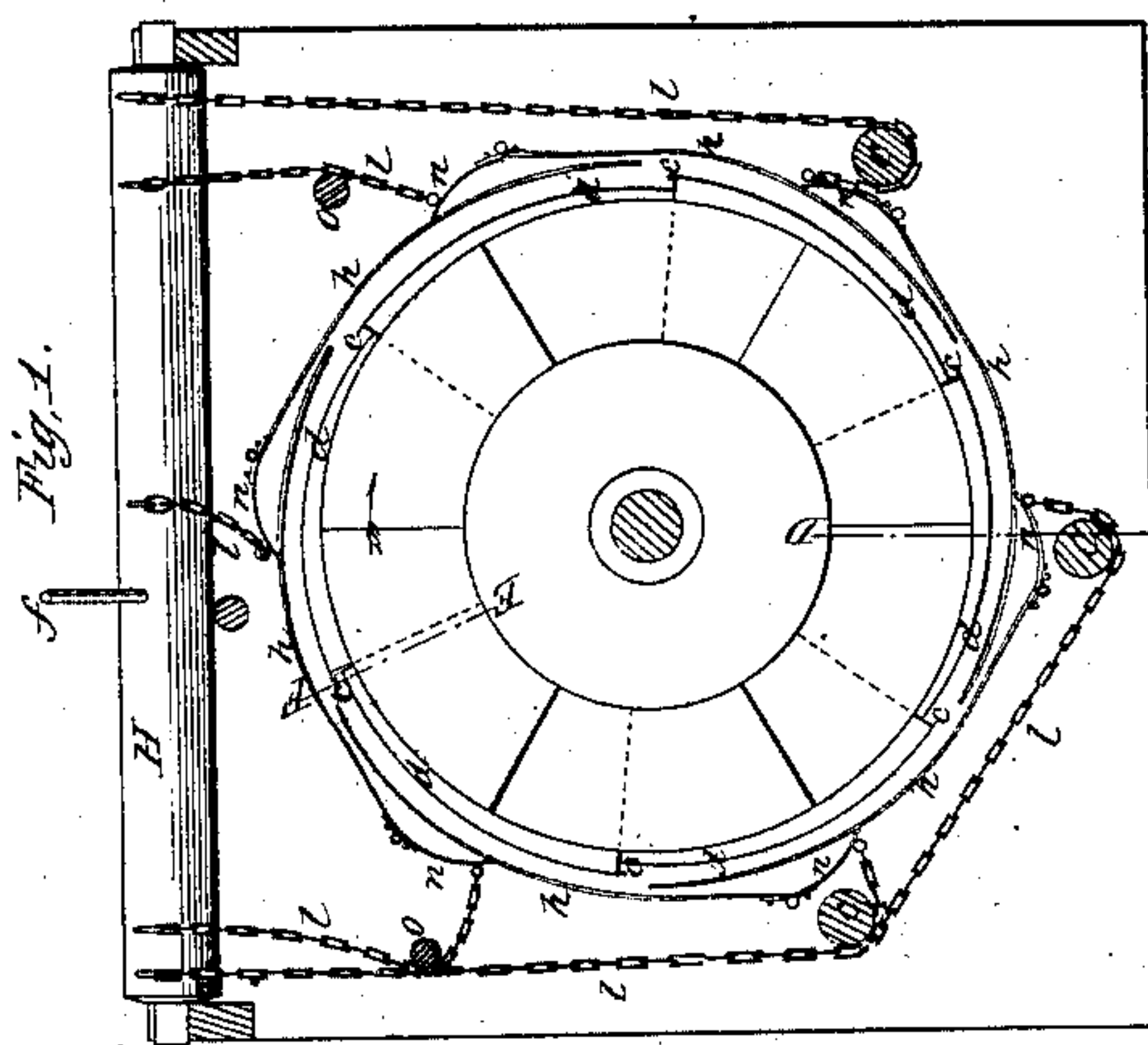
*Fig. 4.*

*Top View Showing Wheel.*



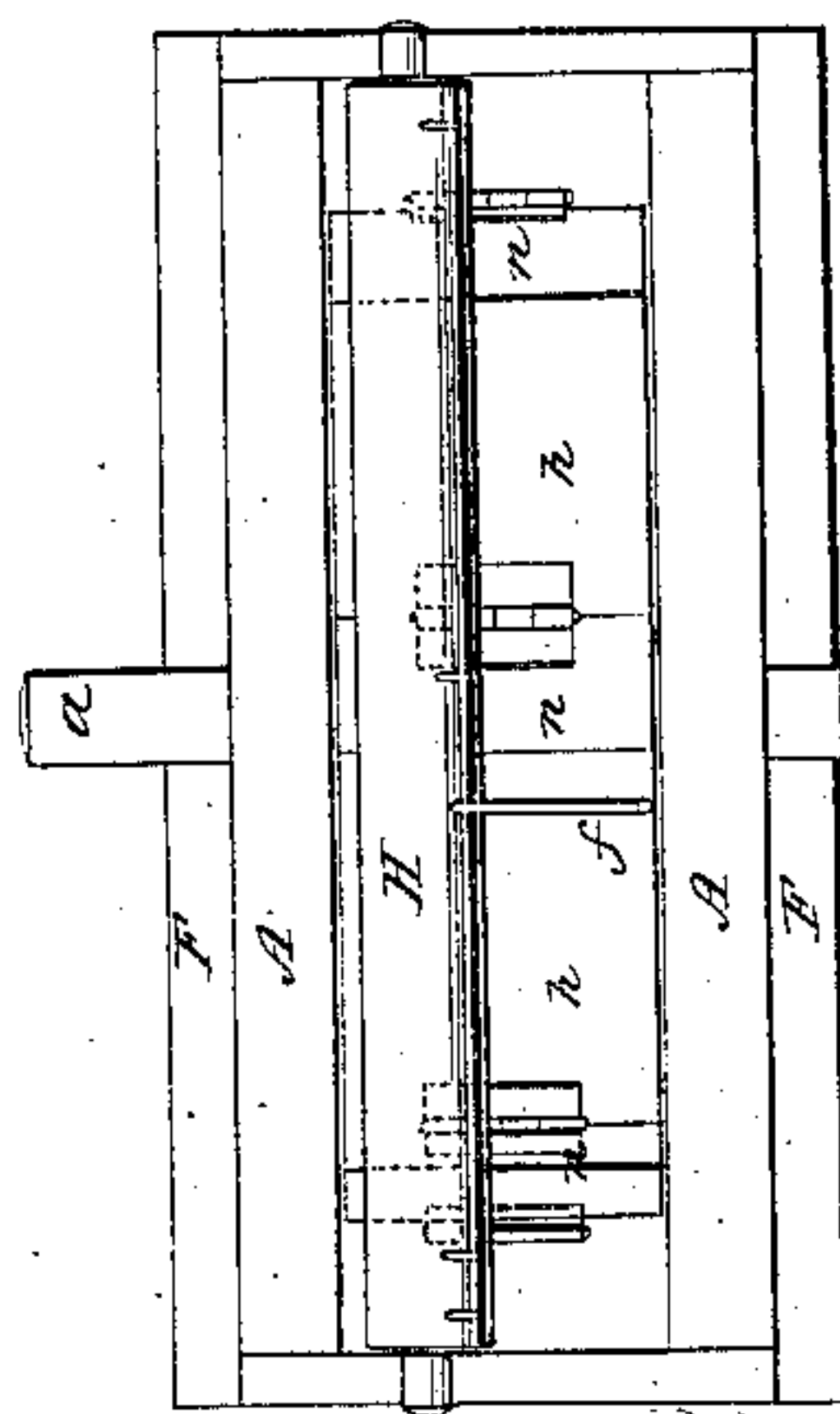
*Fig. 2.*

*Section on B-B.*



*Fig. 1.*

*Section on A-B.*



*Fig. 5.*

*Top View Showing Studs.*

*Witnesses,  
T. J. Rossier.  
P. J. Dodge.*

*Inventor,  
R. Chapman  
By H. C. Dodge Attorney.*



# United States Patent Office.

ROCKWELL CHAPMAN, OF BUCHANAN, MICHIGAN.

*Letters Patent No. 62,473, dated February 26, 1867.*

## IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, ROCKWELL CHAPMAN, of Buchanan, in the county of Berrien, and State of Michigan, have invented certain new and useful improvements in Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use the invention, I will proceed to describe it.

My invention relates to that class of water-wheels which are denominated direct-action wheels, and which are intended to revolve in a vertical plane on a horizontal shaft. My invention consists in a novel construction of the buckets and water-passages or vents, and in a novel arrangement for opening the gates.

Figure 1 is a longitudinal vertical section, taken on the line  $x\ x$  of fig. 4; also on line A B of fig. 2.

Figure 2 is a transverse section, taken on the lines C D and E F.

Figure 3 is a side elevation.

Figure 4, a top plan, with a portion of the case removed; and

Figure 5, a similar view, with the case on.

I construct my wheel with a solid central hub, E, usually of wood. The buckets  $c$  consist of plane surfaces projecting radially from this central hub, the rear side of these buckets consisting of solid blocks extending back for about half their length toward the face of the next bucket, of full width, from which point they are cut away on each side to a point at the centre, as shown in fig. 4. The outer surfaces are drawn slightly in on their outer faces until they arrive at the point, where they join on to the vertical face of the next succeeding bucket at a point slightly below the outer edge of the bucket  $c$ . From the outer edge or sides of the buckets  $c$ , on each side, a curved metallic plate,  $u$ , extends forward to about the centre of the bucket in front, where it terminates in an opening outside of the plate immediately preceding it, thus forming a vent or passage for the discharge or escape of the water that has been projected against the face of the bucket  $c$ . This passage is lozenge shaped in its cross-section, as represented at  $b$  of fig. 2, the metallic plates  $u$  forming the outer wall of the passage, and the curved surface of the solid portion  $d$ , in rear of the buckets, forming the inner wall for about half the distance, or until the part  $d$  becomes of full width, from which point, to the termination of the plate  $u$ , the next plate  $u$  thence to the mouth  $m$  constituting the inner wall of the vent or passage. The wheel thus formed is mounted in a case consisting of two side pieces A, constructed of plank, and having an opening cut in them of a size corresponding with the diameter of the wheel. Between these sides A of the case are placed a series of curved metallic plates,  $h$ , as shown in fig. 1, these plates lapping or extending past each other, as there shown, and serving as guides to direct the water on to the buckets  $c$ . At the outer end of each of these plates  $h$  a curved gate,  $n$ , is hinged, as shown in figs. 1 and 5, the outer end of each gate being curved inward, so as to impinge against the outer surface of the guides  $h$ . The wheel being immersed in the water, it is obvious that the pressure of the water on the outside of the gates will press them shut. In order to open them, a chain,  $l$ , is attached to each gate, and passing around a roller,  $o$ , extends up to the top of the case, where they are attached to a roller, H, by the turning of which, by means of a lever,  $f$ , the chains are wound upon the roller and the gates thus opened. It will thus be seen that when the gates are opened the water will rush in between the guides  $h$ , and, striking against the face of the buckets  $c$ , will impart its momentum to the wheel, and as the latter revolves, the water which has thus expended its force will escape through the vents or passages  $b$  on each side of the wheel at the mouths  $m$  of said passages.

In using this wheel, it may be set in the flume, openings being made for the escape of the water at the sides, or the water may be conducted to it in a chute or pipe, the case A in that case being closed up around its edges, so as to prevent the escape of the water except by passing through the wheel.

Having thus described my invention, what I claim, is—

A water-wheel having the radial buckets  $c$  extending in a straight line across the face of the wheel, with the solid triangular projection  $d$  in rear of said buckets, and the curved passages  $b$  formed by the overlapping plates, the whole constructed and arranged as herein shown and described.

2. The combination of the hinged gates  $n$ , chains  $l$ , and roller H, arranged and operating as set forth.

ROCKWELL <sup>his</sup> ~~X~~ CHAPMAN.  
mark.

Witnesses:

GEO. H. RICHARDS,

GEORGE D. DUTTON.