A. Chapman,

Water Wheel.

No. 4,128. Patented July 30, 1845.

Fig. 2.

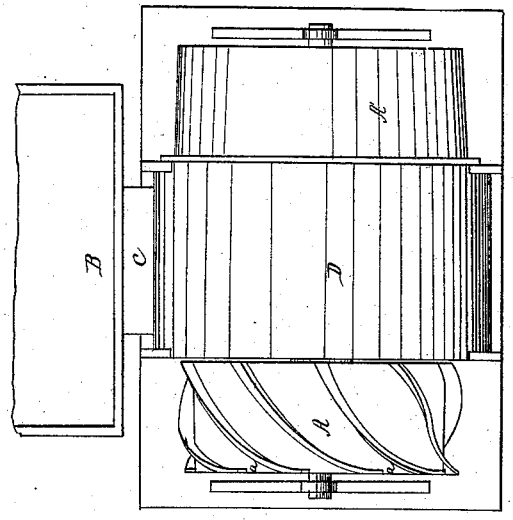
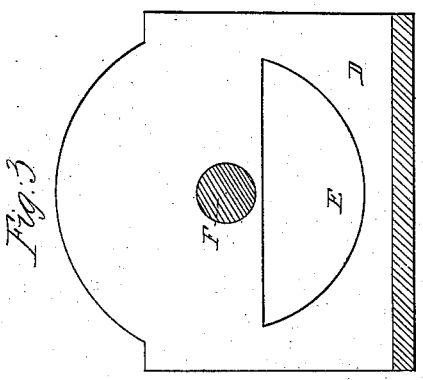


Fig. 3



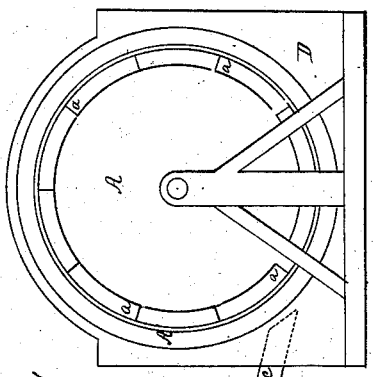
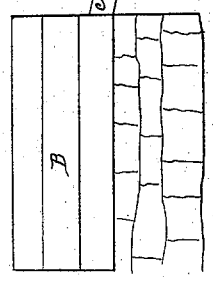


Fig. 1



UNITED STATES PATENT OFFICE.

ABNER CHAPMAN, OF POPES CORNERS, NEW YORK.

REACTION WATER-WHEEL.

Specification of Letters Patent No. 4,128, dated July 30, 1845.

To all whom it may concern:

Be it known that I, ABNER CHAPMAN, of Popes Corners, in the county of Saratoga and State of New York, have invented a new and useful Improvement in the Manner of Constructing Reaction Water-Wheels; and I do hereby declare that the following is a full and exact description thereof.

In constructing my water wheel, I prefer to make it double, using two wheels on one horizontal axis, as has frequently been done with such wheels; the principle of my improvement may, however, be applied to a single wheel if desired, but in describing it I shall consider two as combined.

My improvement consists in the so constructing the water wheels, as that their diameter may be considerably greater than the height of the fall, or head, of water by which they are driven; they may, for example, be ten or twenty feet in diameter, and revolve vertically, although the head of water in the forebay may not exceed five or six feet; the only limit in this particular being that which convenience and judgment may suggest.

My wheels have issues around their peripheries which deliver the water in a direction nearly tangential to the circle in which they move, receiving the water from a close trunk, near to their peripheries on one side, and delivering it on the opposite side. The practice heretofore has been to allow the water to flow from the trunk into the wheel at all the openings by which they are surrounded; but it is allowed to enter my wheels at their lower part only, say to a height of from one eighth to that of one half their diameters, this being governed by the diameter given to them in proportion to the height of the head of water by which they are to be driven. The quantity of water issuing from a large wheel with a greater number of issues may, under this construction, be less than that which issues from the ordinary reaction wheel of small diameter. This mode of construction has been found to be productive of great advantage in the amount of power derived from the quantity of water expended, resulting from the decreased velocity of the wheel and the distance of the point of the action of the water from the center of motion.

In the accompanying drawing, Figure 1, is a side view of my apparatus. Fig. 2, is a top view thereof, and Fig. 3, a side view of that part of the trunk against which the wheel revolves, the wheel being removed.

A, A, are the wheels, and *a*, *a*, the openings in the face of one of them, through which openings the water issues. In Fig. 2, the outer shell, or peripheray, A′, of one of the wheels is in part removed, to show the manner in which the buckets that form the issues are curved; in this particular, however, my wheel does not differ from some others that are known and used. B, is a penstock from which the wheel is to receive its supply, and C, the chute, or spout, through which the water passes from the penstock into the trunk, D, through which the shaft of the wheels passes. It is not necessary, however, that there should be a trunk like D, for that purpose, as the shaft may pass directly through the penstock, B, when circumstances are such as to admit of it.

In the end, or side, of the trunk, D, Fig. 3, E, is the opening through which the water flows from the trunk into the buckets, and F, that for the shaft of the wheel; the opening, E, is shown as extending up to about one third of the height of the diameter of the wheel, and the water will, consequently, flow into about one third of the issues; slides might be employed to alter and regulate this height, but it would render the apparatus more complex, and liable to be out of order, and it is believed that, in all cases, it will be best to render this part permanent, adapting it to the diameter of the wheel, and the height of the head. The wheels must be made to run close to the end of the trunk, D, in that part where the opening E, is made, but it need not be in contact with it in any other part.

Having thus, fully described the nature of my improvement in the reaction water wheel, what I claim therein as new, and desire to secure by Letters Patent, is—

The delivering of the water from a penstock, or trunk, into the issues, or buckets, of a reaction wheel, that revolves vertically, at the lower part, only, of such wheel, by forming the opening from such penstock, or trunk, so that it shall enter such wheel at its lower part only, in the manner and for the purpose set forth, by which construction and arrangement I am enabled to give any desired diameter to such reaction wheel.

ABNER CHAPMAN.

Witnesses:

THOS. P. JONES,

A. H. PEARSALL.