2 Sheets--Sheet 1.

WILLIAM READING.

Rotary Motors.

No. 126,086. Patented April 23, 1872.

Fig. 1

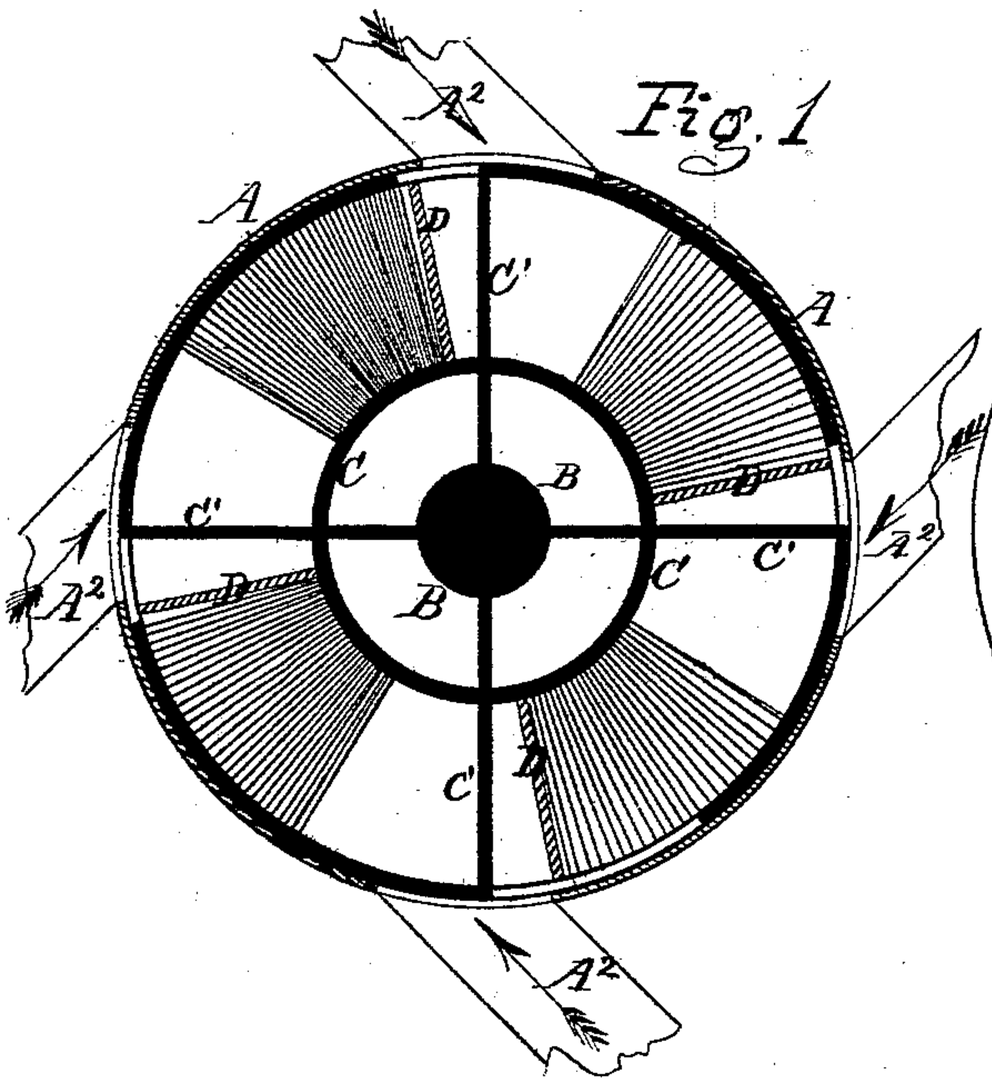


Fig. 2

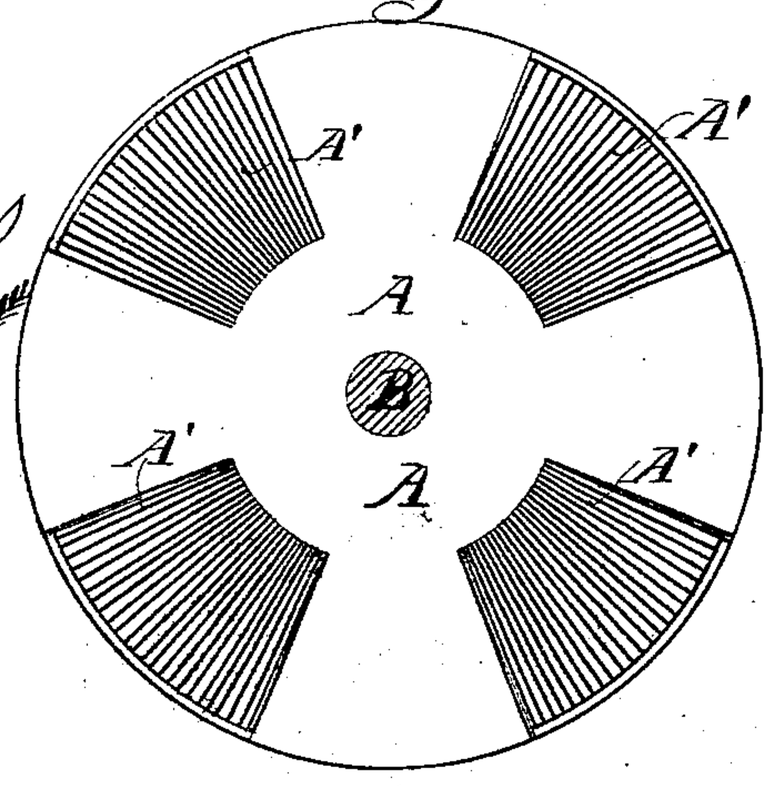


Fig. 3

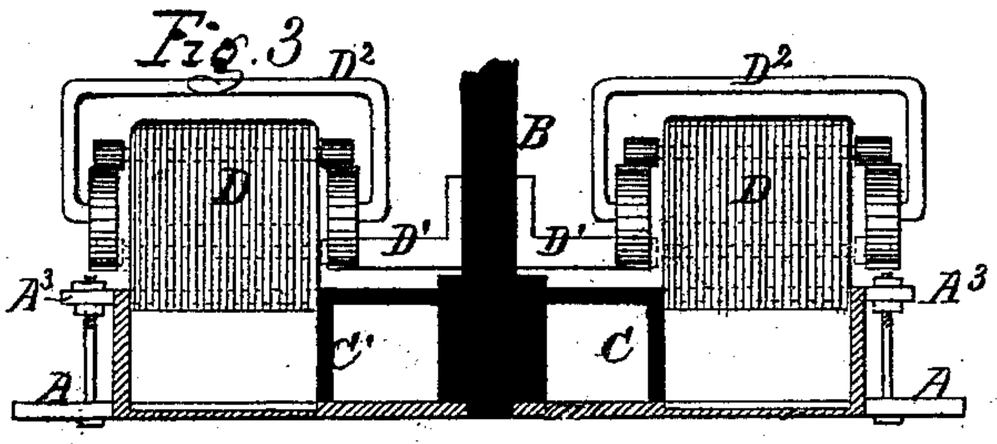


Fig. 4

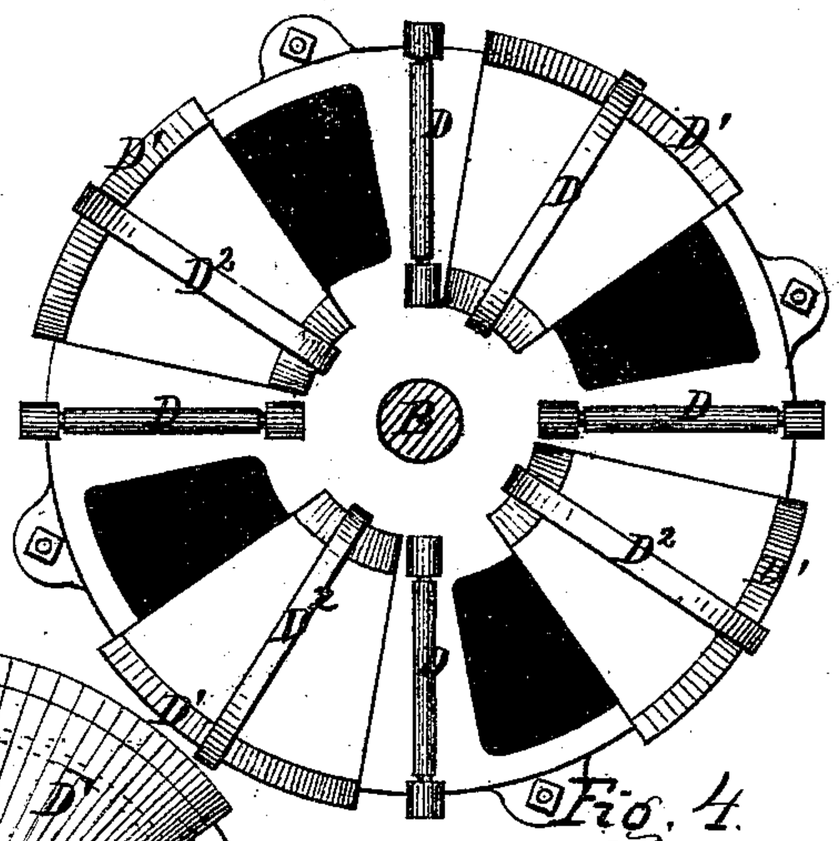
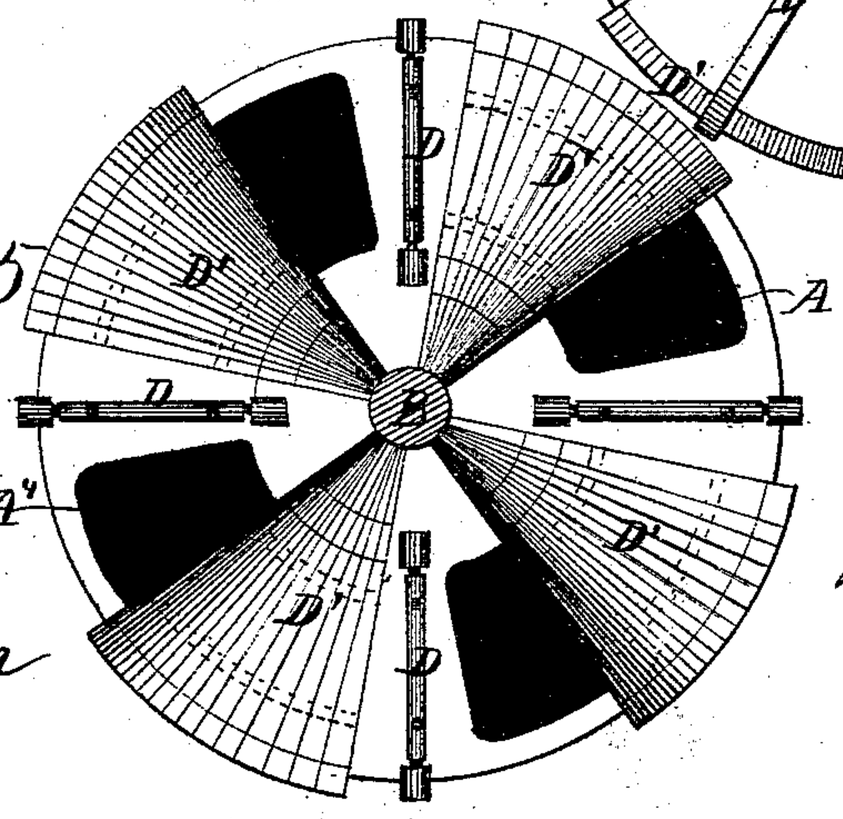


Fig. 5



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Rotary Motors.

No. 126,086. Patented April 23, 1872.

Fig. 6

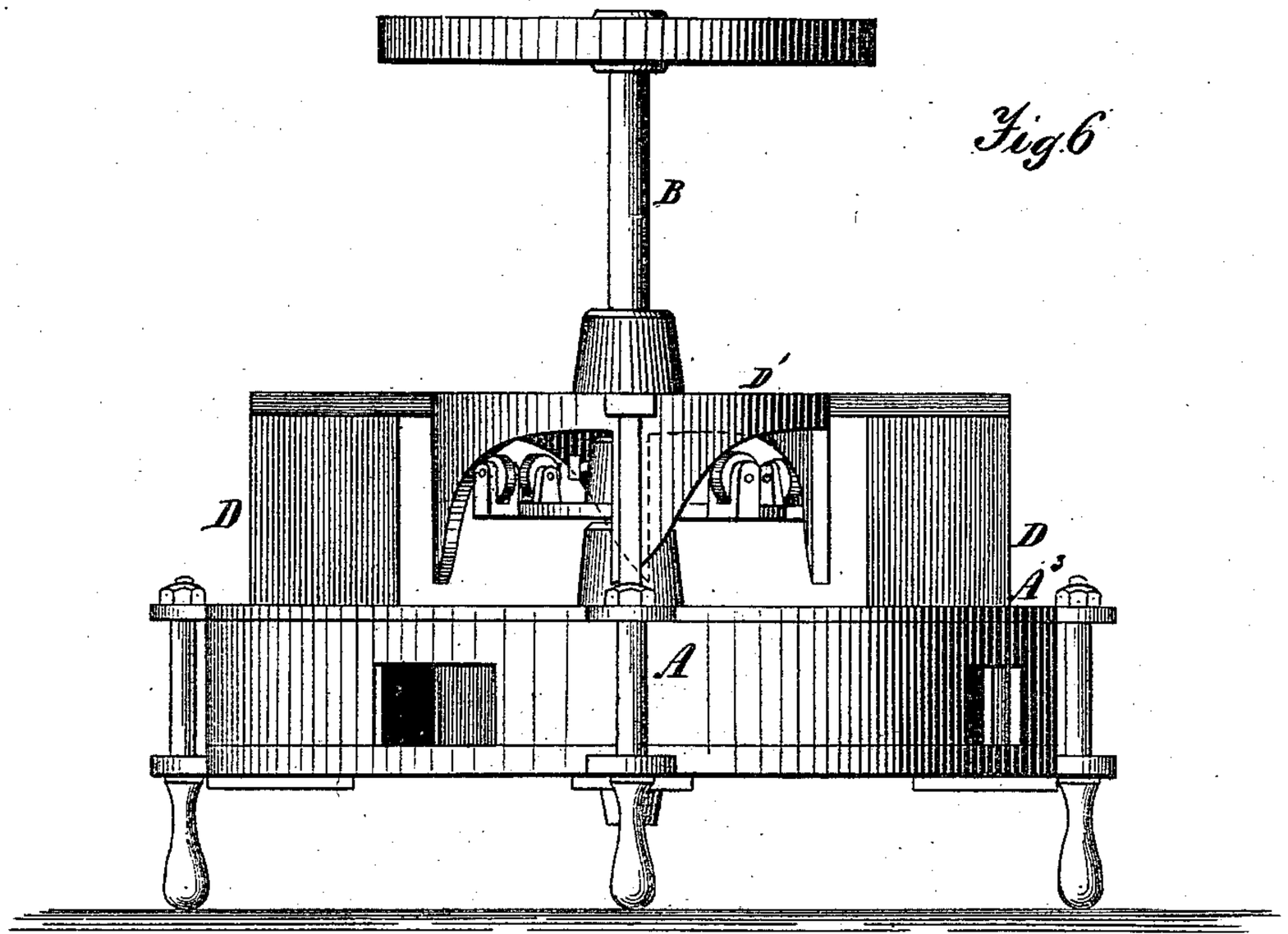


Fig. 7.

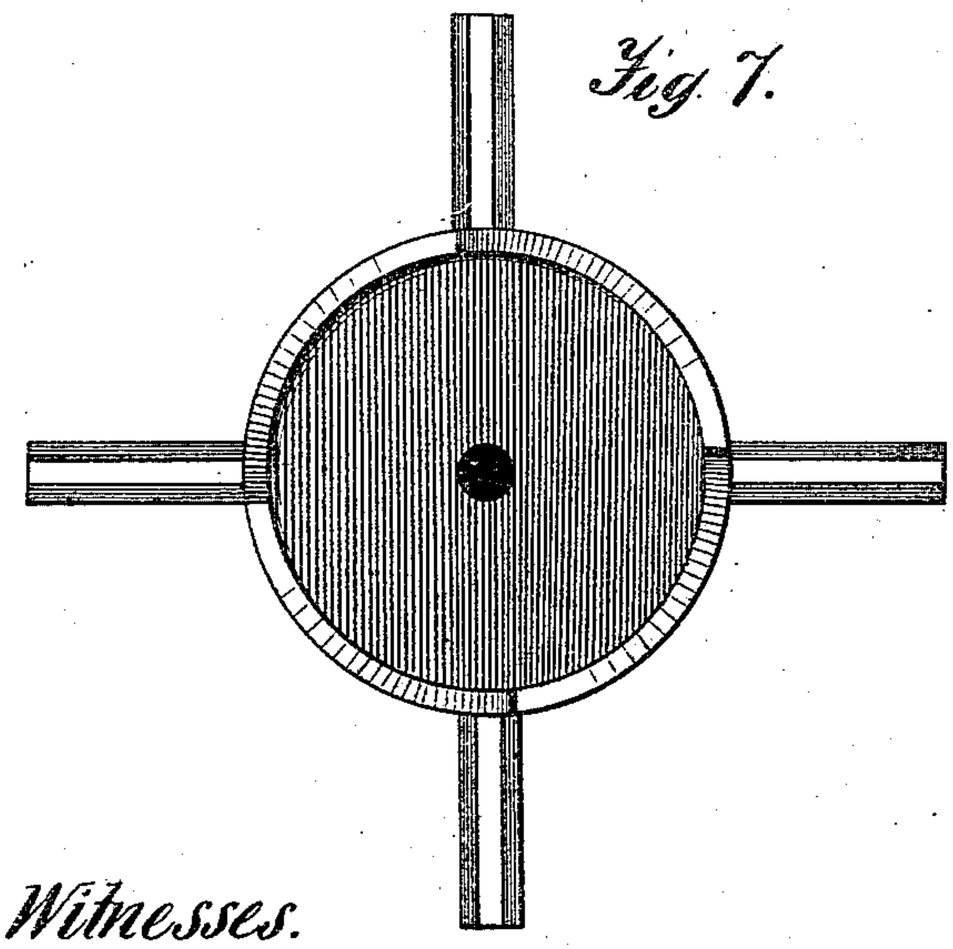
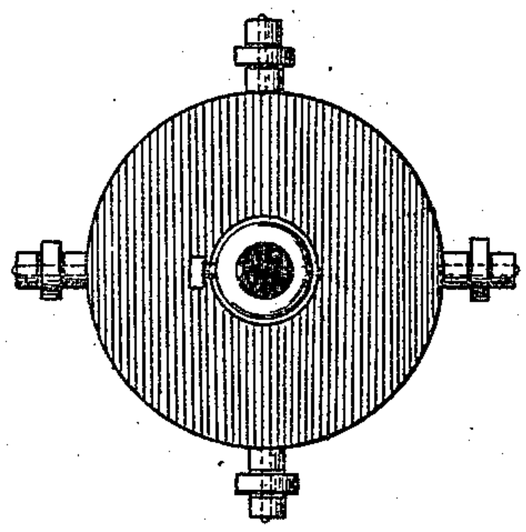


Fig. 8.



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126,086

UNITED STATES PATENT OFFICE.

WILLIAM READING, OF GEORGETOWN, DISTRICT OF COLUMBIA.

IMPROVEMENT IN ROTARY MOTORS.

Specification forming part of Letters Patent No. 126,086, dated April 23, 1872.

Specification describing certain Improvements in Rotary Motors, invented by WILLIAM READING, of Georgetown, in the county of Washington and District of Columbia.

This invention relates to that class of motors which are to be propelled by water, but which are also adapted to the use of steam, air under pressure, or any of the gases used for such purpose when sufficiently compressed for the purpose; and it consists in constructing, combining, and arranging the parts of such a motor in such a manner that said fluids or gases may be used, under pressure, to produce a rotary motion in conjunction with the momentum, as will be more fully described hereinafter.

Figure 1 is a horizontal central section of the outer stationary case and of the rotating portion of the wheel or motor, showing the induction-passages through the rims or flanges, the discharge-passages in the bottom of the case, and the sliding gates or abutments. Fig. 2 is a bottom view of the outer stationary case, showing the discharge-apertures therein. Fig. 3 is a vertical central section, showing the outer case, the revolving wheel, the shaft, the sliding abutments, with the anti-friction rollers and the upper revolving plate which lifts said abutments. Fig. 4 is a plan view of the upper plate of the motor, which is stationary, showing the discharge-apertures and the slots through which the abutments slide. Fig. 5 is a plan view of the revolving disk which carries the cams for operating the sliding abutments, and showing also the upper ends of such abutments, and their rollers, and a portion of the lower plate of the motor, with its discharge-apertures. Fig. 6 is an elevation of the motor, showing a modified form of the sliding abutments and of the rollers which raise them. Fig. 7 is a plan view of the disk and arms which carry the abutments. Fig. 8 is a plan view of the disk and rollers which raise said abutments.

Corresponding letters refer to corresponding parts in the several figures.

In constructing motors of this description I use a case, A, of metal, constructed as shown in Figs. 1 and 2—that is to say, with a bottom stationary plate, having in its lower surface four, more or less, apertures, A^1 A^1, for the discharge of the water or other motive agent, each one of such apertures comprising about one-eighth of the lower surface of the plate. Upon the periphery of this plate there is an upwardly-projecting flange, which is equal in depth to the desired height of the motor. Through this flange openings are formed, as shown in Fig. 1, said openings being covered by induction-pipes or spouts A^2 A^2, as shown in the same figure. A shaft, B, is stepped in the case A, and extends upward for any desired distance, and carries upon its upper portion a gear-wheel or other device for transmitting its motion to the machinery to be driven. Upon that portion of the shaft B which is within the case A there is firmly secured a wheel, C, which is composed of a hub for the reception of the shaft, four, more or less, arms, and two projecting flanges, one of which is upon the outer ends of the arms, and the other at such a distance therefrom and toward the center as will give the desired area of surface to be acted upon by the propelling agent. The depth of these flanges is to be equal to that of the flange upon the case A, and the outer one is supplied with apertures, which commence at or near the arms and extend rearward therefrom for a sufficient distance to permit the passage of a sufficient amount of water, steam, or gas to fill the space between the receding arms of the wheel and an abutment soon to be described. These apertures are so arranged that their front edges pass the edge of the induction-passages A^2 in the case just after the arms of the wheel have passed over the edge of the closed portions of the lower plate of case A, and are closed so as to stop the flow of water to the wheel by passing beyond the aperture in the flange of case A, when the arm passes another edge of the apertures A^1 in the bottom of such case. Over the top of the wheel C and the upper edge of case A a plate, A^3, is placed, which may have apertures A^4 in it for the discharge of water, when that agent is employed, in case the apertures in the lower plate should prove insufficient. This plate extends outward beyond the flange of the case A, as shown in Fig. 3, in order that bolts may be passed through it and through a corresponding extension of the bottom plate; and thus the plate A^3 may be adjusted with reference to the other parts, so that no water or gas can escape at that point. This plate also has

slots formed in it, as shown in Figs. 3 and 6, through which the abutments slide in opening and closing, said abutments being shown at D, Figs. 1, 3, and 6, they consisting of plates of metal of sufficient height to extend above the top of the case A, when their lower edges rest upon the bottom plate thereof, far enough to admit of there being attached to them a cross-bar, which carries upon its outer ends small rollers for the purpose of facilitating the raising of the abutments, their width being such as to cause them to just pass between the flanges of the wheel C, so that when they are dropped down and are acting as abutments no water can escape past them; or they may be arranged as shown in Fig. 6. The location of these abutments is clearly shown in Fig. 1 of the drawing, it being just at the front edge of the solid portions of the bottom of case A, in order that they may be dropped down as soon as the arms C′ of the wheel C have passed that point, at which time the water is admitted between them and the arms C′ of the wheel, and thus forces it forward by the pressure created between it and the abutment at the same time that the momentum of the water is acting in the same direction. Upon the shaft B, and above the plate A^3 of the wheel or motor, there is secured a disk, D^1, which extends outward nearly to the inner edge of the abutments, where it rises and forms a cam, which passes under one of the rollers attached to the abutment, there being a similarly-formed cam on the outside of the abutments for operating upon the opposite roller, the two being united by a plate, D^2, as shown in Fig. 3, or by flanges attached to the disk D^1, as shown in Fig. 5, or as shown in Fig. 6. The drawing shows the arms of the wheel C as radiating from the hub of the wheel in a straight line; but it is apparent that they may be curved and an equally good result be produced, the edges of the apertures in the bottom of case A being curved to correspond. Should the apertures in the flange of the wheel prove to be too small for high rates of speed, a slide may be attached to the outer case, which shall be caused to be raised by the movement of the wheel C and give an increased area of opening, it being caused to resume its original position by means of a spring.

The operation of this motor is as follows: The parts having been constructed and arranged substantially as shown, water, steam, or gas is admitted into the chutes or pipes A^2 by a gate or cock, and, supposing the parts to be in the position shown in Fig. 1, it passes between the abutments D D, which are down and resting upon the bottom of case A, and the receding arm of wheel C, and forces the wheel forward until the arm has passed over the aperture in the lower plate, indicated by the dark lines, just before which time the aperture in the flange of wheel C has passed the aperture in the rim or flange of case A and the inflowing fluid has been cut off, and that which had passed into the space between the arms and the abutments falls out by its own gravity through apertures A^1 A^1 in the bottom of the case. To provide for the opening of the abutments at the proper time the cams on the disk D^1 are so arranged that they, in their revolutions, come in contact with the rollers upon the abutments just after the arms C^1 C^1 of the wheel have passed over the apertures in the bottom of case A, thereby raising them clear of the arms and allowing them to drop as soon as said arms have passed over the edges of the solid portions of the bottom of case A, just after which the motive agent will again enter, and the operation of propelling the wheel will be repeated.

It will be observed that there are shown four abutments and four arms to the wheel; it is, however, evident that this number may be increased at pleasure and according to the diameter of the motor, it being desirable, however, to have an even number, in order that the horizontal pressure of the ingoing agent may be balanced and thus the friction reduced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A water-wheel or other motor, combining in its construction a case, A, shaft B, wheel C, vertically-moving abutments D, and cams for operating the abutments, substantially as shown and described, and for the purpose set forth.

2. The case A, when constructed with induction-apertures in its periphery and eduction-apertures in its lower plate, said apertures being arranged, with reference to the wheel C, substantially as and for the purpose set forth.

3. The construction and arrangement of the case A, wheel C, and abutments D, whereby tight chambers are formed extending over four parts, more or less, of the surface of the bottom area of the motor, and in which the propelling agent is used under pressure, while it is allowed to escape through openings formed in the remaining portions of said bottom plate, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM READING.

Witnesses:
EDM. F. BROWN,
D. P. HOLLOWAY.