No. 827,165.

PATENTED JULY 31, 1906.

J. L. MARINER.

HYDRAULIC MOTOR.

APPLICATION FILED JULY 11, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

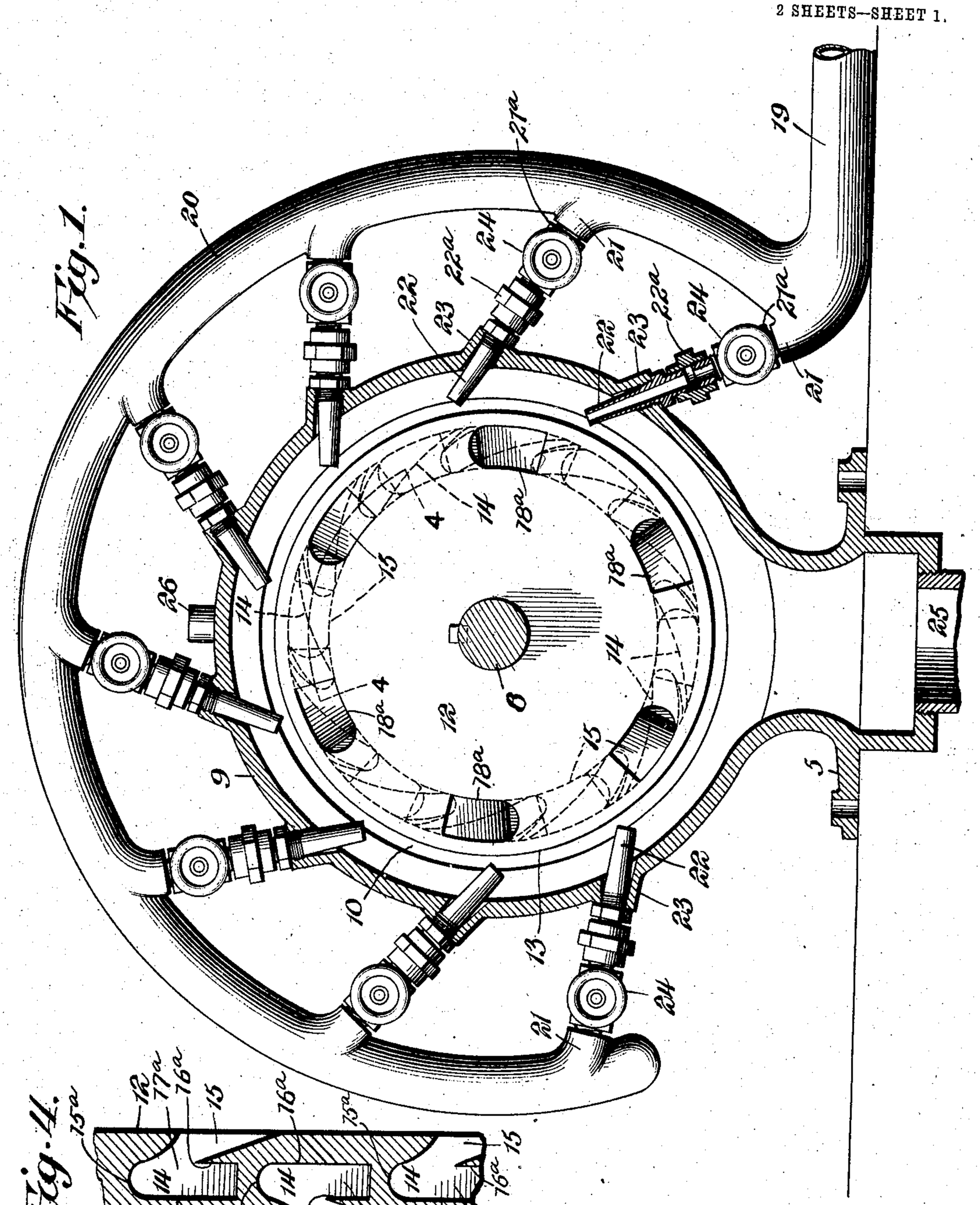

Fig. 4.

Witnesses
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B. G. Foster.

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2 SHEETS—SHEET 2.

Fig. 2.

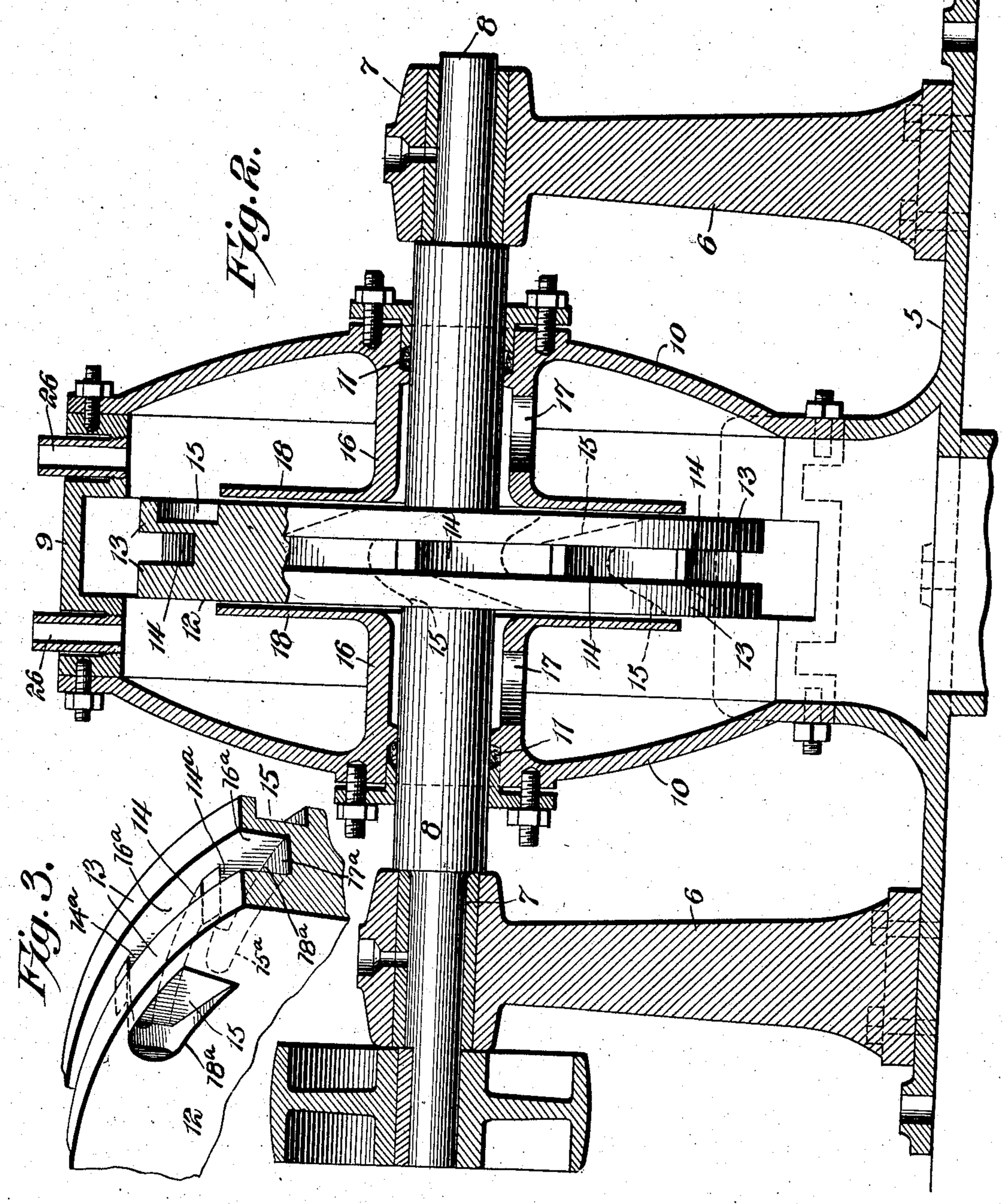

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOSEPH L. MARINER, OF GOLD HILL, OREGON.

HYDRAULIC MOTOR.

No. 827,165. Specification of Letters Patent. Patented July 31, 1906.

Application filed July 11, 1904. Serial No. 216,129.

To all whom it may concern:

Be it known that I, JOSEPH L. MARINER, a citizen of the United States, residing at Gold Hill, in the county of Jackson and State of Oregon, have invented a new and useful Hydraulic Motor, of which the following is a specification.

This invention relates more particularly to that type of motor popularly known as "rotary impact," wherein one or more streams of water are directed by suitable nozzles against a rotary wheel.

One of the objects of the invention is to provide a novel construction wherein the discharged water after having acted upon the wheel is directed away from the same, thereby obviating frictional resistance to a very material degree.

Another object is to provide an arrangement wherein the end thrust is obviated; and still another object is to provide a motor that can be easily dismembered and wherein the various parts are readily accessible for repair or renewal.

An embodiment of the invention that is at present considered the preferable one is illustrated in the accompanying drawings, wherein—

Figure 1 is a sectional view through the motor. Fig. 2 is another sectional view taken at right angles to Fig. 1. Fig. 3 is a detail perspective view of a portion of the wheel. Fig. 4 is a detail sectional view taken on the line 4 4 of Fig. 1.

Similar reference-numerals indicate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, a base 5 is employed, upon which are mounted spaced standards 6, having journal-bearings 7 at their upper ends, that receive a power-shaft 8. Between the standards 6 and preferably carried by the base 5 is a casing consisting of an annular wall 9, with end walls 10 secured thereto, said end walls having suitable stuffing-boxings 11, through which the shaft 8 passes. It is to be noted that the annular wall has an annular recessed channel in its inner side.

A rotary wheel 12 is secured to the shaft 8 and is located within the casing, said wheel having flat opposite sides and being provided with peripheral spaced flanges 13, the outer edges of which are located directly adjacent to the opposite sides of the annular channel. Undercut buckets 14, disposed in tandem relation, are formed in the peripheral portions of the wheel and have peripherally-opening inlet-mouths 14^a, that are located between the flanges 13. The buckets are formed with end walls 15^a, side walls 16^a, and bottom walls 17^a. They are furthermore provided with laterally-arranged flared discharge-outlets 15, which incline rearwardly and open through the opposite sides of the wheels, the mouths thereof being flared, as shown particularly in Fig. 4 and designated 18^a. It will furthermore be noted that the discharge-outlets 15 alternately open on opposite sides of the wheel for the reasons hereinafter given, and their inner ends are of less width than the length of the pocket-walls through which they pass, as clearly illustrated in Fig. 4.

Stationary hub-sections 16 are carried by the end walls 10 of the casing and surround the shaft 8 on opposite sides of the wheel, said hub-sections being preferably spaced from the shaft and having water-outlet openings 17 in their lower sides. The inner ends of the sections 16 are provided -ith outstanding guard-disks 18, located directly adjacent to the opposite side faces of the wheel and parallel thereto, but preferably spaced a slight distance therefrom. The disks 18 have their peripheries located inside the discharge-outlets 15 of the buckets and in spaced relation to the walls of the casing.

Water is supplied to the motor from a pipe 19, having a semicircular portion 20, extending partially around and in spaced relation to the wall 9 of said casing. Nipples 21, arranged on the inner side of the semicircular portion 20 of the supply-pipe, have threaded thereinto couplings 21^a, that are also threaded into unions 22^a, connected to nozzles 22, formed in the wall 9 of the casing, the nozzles projecting through the outstanding nipples 23 of said casing into the annular channel and alined with the space between the flanges 13 of the wheel. Valves 24, arranged in the couplings between the pipe 20 and the wheel-casing, control the supply of water through said nozzles. The outlet for the discharged water is through the bottom of the casing by means of a suitable discharge-pipe

25, and vent-nipples 26, located in the upper portion of the casing, prevent the formation of a vacuum therein.

Water is supplied to the pipe 19 through any suitable head, which may have any pressure desired. This water will thence pass into the pipe 20, and consequently through the nozzles 22, the amount being regulated by the valves 24. The water will be projected from said nozzles into the buckets 14 and will escape therefrom on opposite sides of the wheel. This alternate discharge on opposite sides will prevent the end thrust upon the shaft—a very important feature in a wheel of this character. The water discharged from the buckets will be projected over the guards 18, and thus be kept away from the side faces of the wheel, finally passing out through the tail-pipe 25. In like manner the portions of the shaft located within the casing will be protected from the discharging water, and frictional resistance therefrom is avoided to a very material degree. The small quantity of water that does find its way between the guards 18 and the wheel will readily escape through the openings 17. With this structure, therefore, it will be seen that not only is end thrust prevented, but frictional resistance is greatly reduced. Moreover, the construction is simple and the wheel may be cast in one piece, giving it plenty of driving weight.

It will be clear that the structure can be readily dismembered and that access can be easily gained to the various parts. This is particularly true of the nozzles and supply-pipe, which are located exteriorly of the casing, so that the valves are conveniently arranged, and each nozzle is independent of the other. It will of course be understood that the wheel and water-supply can be duplicated for the purpose of securing additional power, this latter type of wheel being especially adapted to low heads of water having considerable volume of flow.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention. In this connection and at this point it may be stated that while the invention is embodied in the form of a rotary impact-motor there are features thereof which are undoubtedly capable of advantageous use in connection with turbines.

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

1. In a hydraulic motor, a wheel having spaced peripheral flanges, pockets having closed bottoms, and inlet-mouths located between the flanges, each of said pockets being provided with a single lateral rearwardly-inclined and outwardly-flaring discharge-outlet that opens through one side of its pocket, said outlets opening alternately on opposite sides of the wheel.

2. In a hydraulic motor, a wheel having a peripheral series of undercut pockets disposed in tandem and having peripherally-opening receiving-mouths, and end, side and bottom walls, the pockets of said series each having a single rearwardly-extending outwardly-inclined discharge-outlet opening through one of the side walls of the pocket and of less width than the length of the pocket-wall through which it passes, said outlets flaring outwardly.

3. In a hydraulic motor, the combination with a casing comprising an annular wall and end walls detachably secured to the opposite edges thereof, of a shaft extending across the casing through the end walls, a wheel mounted on the shaft in spaced relation to the end walls and having a peripheral series of buckets provided with outlets through the sides of said wheel, means for supplying motive fluid to the buckets through the annular wall, hub-sections carried by the end walls and detachable from the casing therewith, and guard-disks carried by the inner ends of the hub-sections and located on opposite sides of the wheel directly adjacent thereto, said disks terminating short of the discharge-outlets and being removable with the end walls and hub-sections.

4. In a hydraulic motor, the combination with a casing comprising an annular wall and end walls detachably secured thereto, of a shaft extending across the casing through the end walls, a wheel mounted on the shaft within the casing and having a peripheral series of buckets provided with inlets arranged inside the annular wall and with discharge-outlets opening through opposite sides of the wheel, a supply-pipe extending about the annular wall exteriorly thereof, a plurality of nozzles connected to the supply-pipe and the annular wall and projecting through said annular wall and terminating short of the wheel, hub-sections carried by the said end walls and removable therewith, said hub-sections surrounding the shaft on opposite sides of the wheel and having water-outlets in their lower sides, and outstanding guard-disks carried by the inner ends of the sections and located on opposite sides of the wheel directly adjacent thereto, said disks terminating short of the discharge-outlets and being removable with the end walls.

5. In a hydraulic motor, the combination with a casing having an annular wall provided with an annular recessed channel in its inner side, of a shaft, a wheel carried by the

shaft and having peripheral spaced flanges disposed adjacent to the opposite sides of the channel, buckets formed in the peripheral portion of the wheel, said buckets having inlet-openings between the flanges in line with the recessed channel and having outlets opening through the sides of the wheel, a supply-pipe surrounding the annular wall exteriorly thereof, and a plurality of nozzles connected to the pipe and extending through the annular wall into said annular channel.

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

JOSEPH L. MARINER.

Witnesses:

FRANK CHILDERS,

A. E. KELLOGG.