

O. E. CLEMENT & J. H. WAGNER.

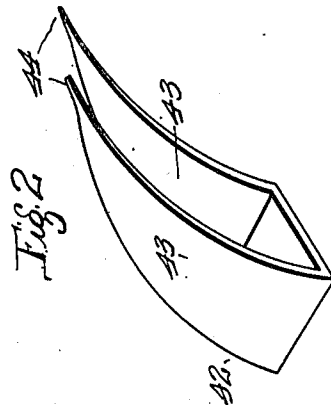
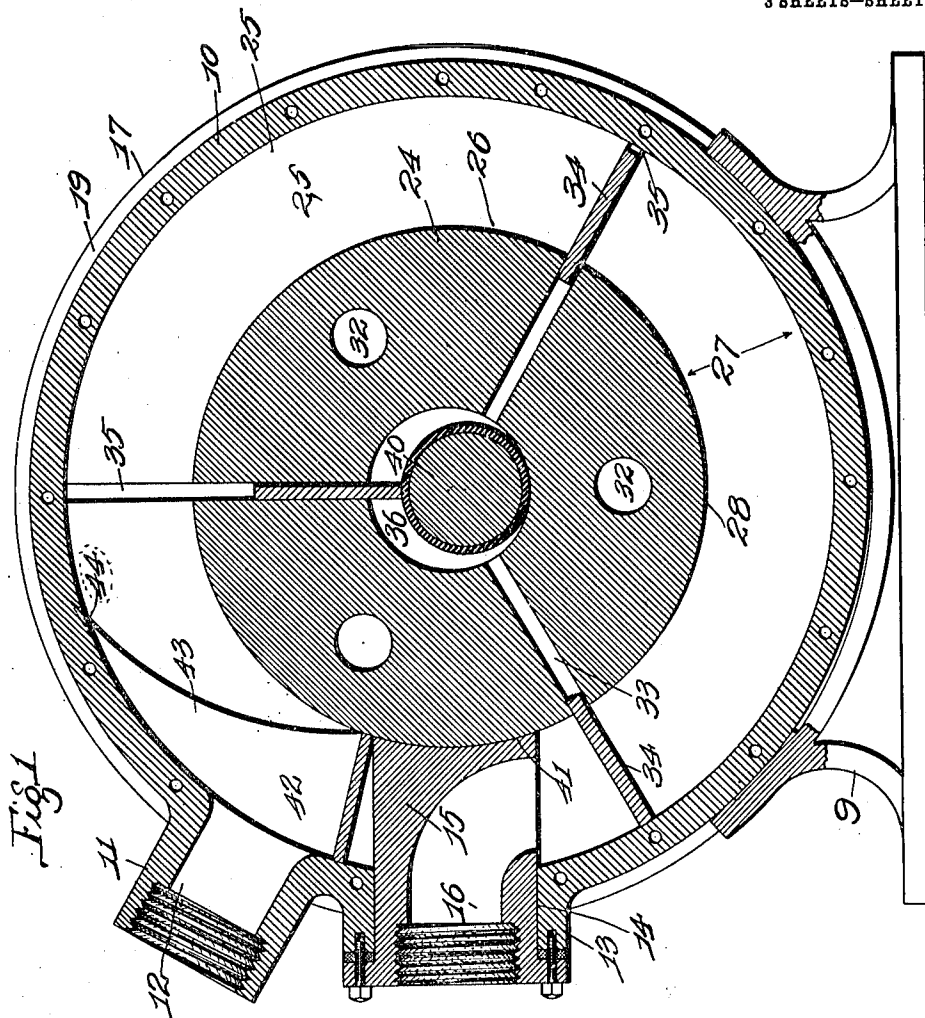
ROTARY PUMP.

APPLICATION FILED JUNE 17, 1909.

Patented Feb. 15, 1910.

3 SHEETS—SHEET 1.

949,219.



Witnesses
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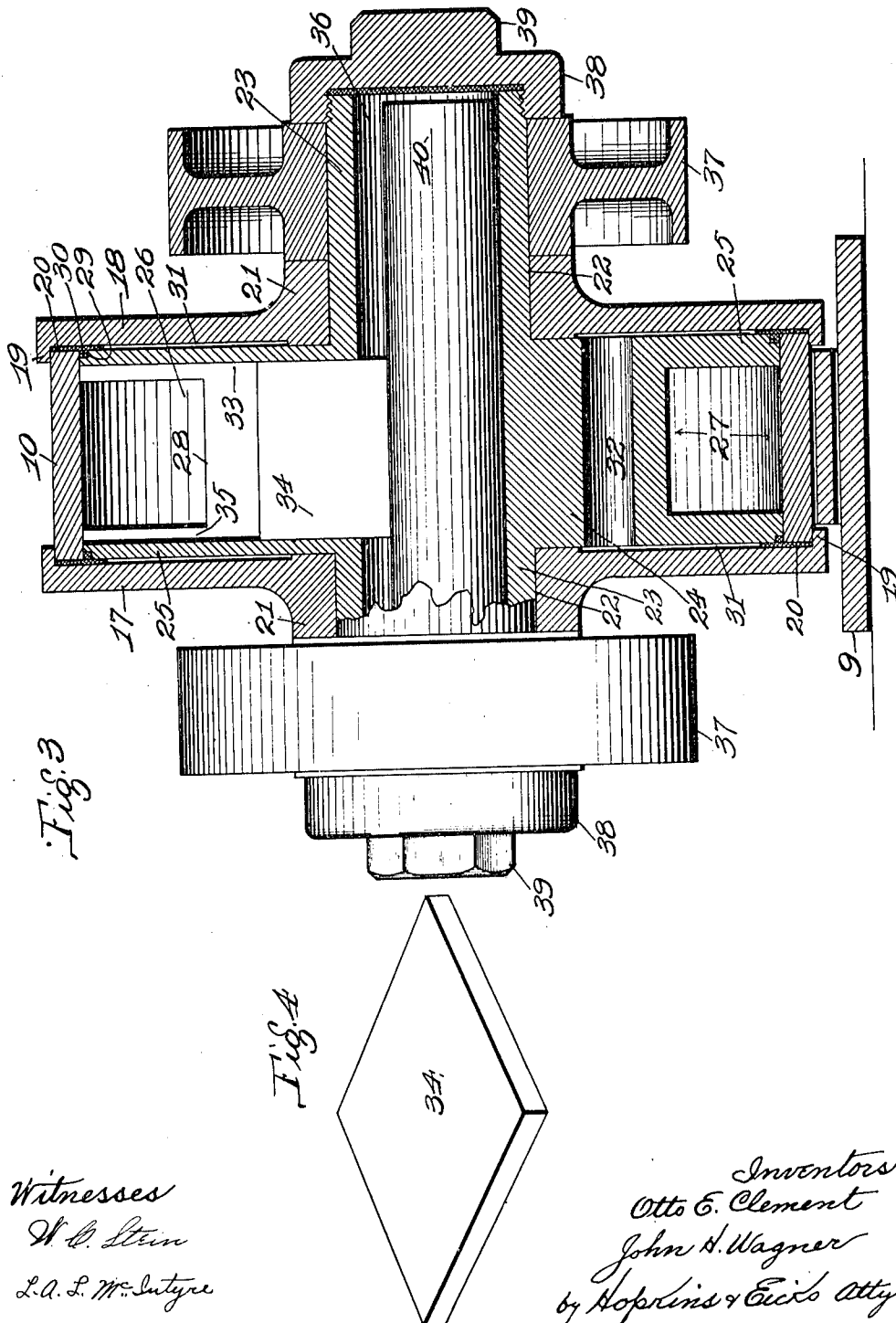
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3 SHEETS—SHEET 3.

Fig. 7

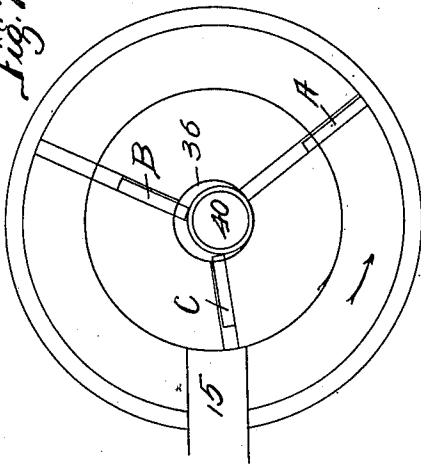


Fig. 8

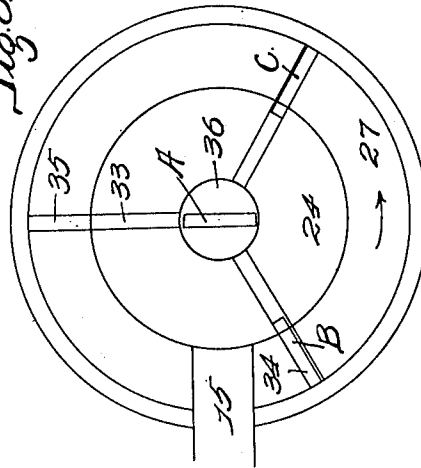


Fig. 5

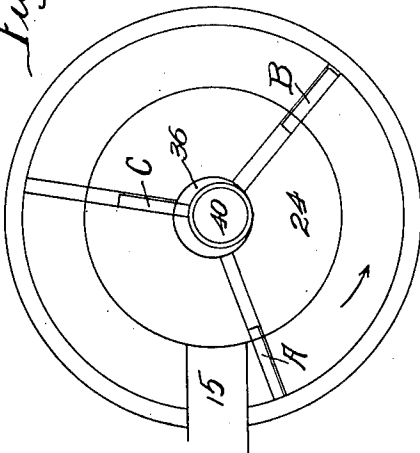
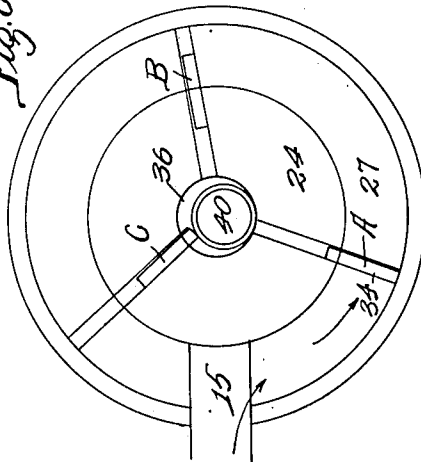


Fig. 6



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UNITED STATES PATENT OFFICE.

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ROTARY PUMP.

949,219.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed June 17, 1909. Serial No. 502,836.

To all whom it may concern:

Be it known that we, OTTO E. CLEMENT and JOHN H. WAGNER, citizens of the United States, and residents of St. Louis, Missouri, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification.

This invention relates to improvements in rotary pumps and has for its object to provide a revolving member axially mounted and provided with a plurality of sliding flukes so arranged as to operate in a passage for creating a suction and discharging the liquid under pressure on the same side and above the suction inlet.

A further object of my invention is the construction of a revolving member having a central opening of sufficient size through which the flukes may be removed and inserted in their proper position in the guide slots without dismantling the entire mechanism.

In the drawings—Figure 1 is a vertical central sectional view of my complete invention. Fig. 2 is a detail perspective view of the emergency guide made use of in connection with my invention. Fig. 3 is a central cross-sectional view with one of the pulleys shown in solid together with the end cap. Fig. 4 is a detail perspective view of one of the flukes. Figs. 5, 6, 7 and 8 are diagrammatic views showing the several positions of the flukes relative to the operation of the revolving member.

In the construction of my invention as shown, I provide a suitable base 9 which has mounted thereon a circular rim 10, said rim provided with an integral projection 11 provided with an opening 12 which acts as an outlet for the discharge of the liquid. The said rim is also provided with a projecting flange 13 which is provided with a square opening 14 and in said opening is inserted a plug 15 having an opening 16 which is curved downwardly and opening into the interior of the rim. This opening acts as the suction end of the pump and to the same is attached any suitable pipe connection through which the liquid is passed and admitted into the pump.

On the sides of the rim 10 is attached cylinder heads 17 and 18, the upper edge of said heads provided with a projecting flange 19 which fits over the edge of the rim and between the rim and the heads is provided a

suitable strip of packing material 20 so as to provide an absolutely leak-proof joint. Each of the heads 17 and 18 is provided with a central boss 21 in which is formed a central opening 22 and acts as a bearing for the sleeves 23 formed on both sides of the revolving member 24. The revolving member 24 is provided with flanges 25 which contact with the inner surface of the rim 10 and between said flanges is formed a channel 26 which acts as a passage 27 between the inner surface of the rim and the periphery 28 of the core of the revolving member, through which the liquid is permitted to travel during the operation of the pump. The outer edge of each of the flanges 25 is grooved as indicated by the numeral 29 and in the same is placed a strip of packing material 30 which contacts with the packing material 20 formed between the rim and the cylinder heads. The inner surface of the heads is channeled as indicated by the numeral 31 so as to form a space between the heads and the flanges 25, and communicating from one side to the other through the core 24 of the revolving member are openings 32 through which air is admitted to pass from one side to the other for the purpose of equalizing the air pressure on both sides of the revolving member and preventing the same from binding during the revolution.

In the core 24 is provided guide slots 33 in which operate flukes 34. These flukes are held parallel with the slots 33 by means of their edges operating in grooves 35 formed in the walls of the flanges 25. The grooves and guide slots are constructed slightly wider than the flukes so as to permit free action to the same so that said flukes may freely operate therein and be prevented from binding while the revolving member is in operation. The sleeves 23 and core, all of which being formed integral, have a central opening 36 of a diameter slightly larger than the length of the flukes. The object of this is to permit the flukes 34 to be inserted in their proper position in the guide slots 33 from the opening 36. On the sleeve 23 are located pulleys 37 by which the pump is driven, and the ends of said sleeve are closed by means of the internally screw-threaded caps 38, each of said caps provided with the hexagonal head 39 so that said caps can be removed and replaced by means of a wrench. In said opening 36 and throughout the

length of the same is placed a roller 40 covered with a strip of flexible material, and said roller is of a diameter smaller than the opening, a portion of which is clearly shown in Fig. 1, and the object of this roller is to hold the flukes in their position within the guide slots 33, yet preventing the closing of more than one of the slots at any time. The plug 15 extends inwardly and has a rounded surface or contacting edge 41 which closely contacts with the periphery of the core 24 and on the top of the same is placed an emergency guide 42 which has a pair of upwardly projecting walls 43, the points 44 of the same placed in small notches formed in the inner surface of the rim and in that manner held in position as shown in Fig. 1. The object of this emergency guide is that in the event any foreign substance should clog between the fluke and the walls of the guide slots and retain the fluke in an extended position, the same by contacting with the walls 43 will force the same inwardly so that the said fluke can pass the plug 15.

The action of the flukes in the slots is by gravity and is described as follows: By referring to Figs. 5, 6, 7 and 8, the various positions of the flukes are shown and when the flukes are in the position as shown in Fig. 5, the fluke A is in a position to create a suction and cause the liquid to follow through the inlet pipe into the passage 27. At this position the fluke B is ready to be relieved of its pressing contact against the inner surface of the rim and the liquid between the flukes A and B is pressed forward by fluke A. Fluke C having performed its function, has by gravity fallen into the slot and has its bottom edge resting on the roller. Fig. 6 shows fluke A farther advanced, the fluke B by gravity sliding toward the center and the fluke C remaining in contact with the roller and all of the liquid between the fluke A and the plug 15 is being driven forward and out through the discharge outlet. In Fig. 7 fluke A has about finished its suction and fluke C is ready to pass outward into a position as shown by fluke A in Fig. 5 so as to resume suction upon the suction inlet. The fluke B in this instance has fallen toward the center and out of operation, the liquid in the passage between fluke A and the plug is passing out through the discharge opening. In Fig. 8 I show the roller 40 removed and one of the flukes in the position ready to be removed from the opening 36. The object of this is that in the event any of the flukes become worn or out of service, by the removal of the caps 38 the roller 40 can be withdrawn and the flukes removed without removing any other portion of the pump and in this manner rapid and ready access can be had to the interior and operating sections of the pump.

Having thus fully described my invention, what I claim as new and desire to have secured to me by the grant of Letters Patent, is:

1. A rotary pump comprising a rim; a pair of cylinder heads; a revolving member located between the cylinder heads and the rim; sleeves formed integral with the revolving member and having bearing in the cylinder heads; a plurality of guide grooves formed in the revolving member and flukes located therein; the revolving member and sleeves provided with a central opening of a size sufficient to remove and replace the flukes, and caps located on the sleeves for closing the ends of the same, substantially as described.

2. A rotary pump comprising a revolving member provided with a peripheral channel and a central horizontal opening; projecting sleeves formed integral with the revolving member; a pair of cylinder heads and the rim forming a housing for the revolving member and in which the same is permitted to operate; a plurality of flukes operating in slots formed in the revolving member and permitted to be removed and replaced through the horizontal opening in the revolving member, and a roller located in the central opening to prevent the flukes from becoming unseated, substantially as specified.

3. A rotary pump comprising a rim mounted upon a base; an inlet and an outlet formed in said rim; a pair of cylinder heads located on each side of the rim; a revolving member located between the cylinder heads and having bearing therein; the revolving member having a peripheral channel which forms a passage between the rim and the revolving member through which the liquid travels; a plug provided with an inlet opening located in the rim and contacting with the revolving member; a plurality of flukes operating in guide grooves formed in the revolving member; a roller located in the central opening to prevent the flukes from becoming unseated during the travel; and caps for closing the ends of the central opening, substantially as specified.

4. A rotary pump comprising a housing; a revolving member; a plurality of flukes operating in guide slots formed in the revolving member and a central opening formed in the revolving member of a size sufficient to remove and replace the flukes without disconnecting the pump, substantially as specified.

5. A rotary pump comprising a housing supported on a base; a revolving member located within said housing, said revolving member provided with a peripheral channel which forms a passage between the housing and the revolving member; a plurality of flukes operating in guide slots formed in the revolving member, said revolving mem-

ber provided with a central opening through which the flukes can be removed and replaced from the center of the pump; and a roller for retaining the same in position
5 when placed in their proper slots, substantially as specified.

In testimony whereof, we have signed our

names to this specification, in presence of two subscribing witnesses.

OTTO E. CLEMENT.
JOHN H. WAGNER.

Witnesses:

L. A. L. McINTYRE,
WALTER C. STEIN.