

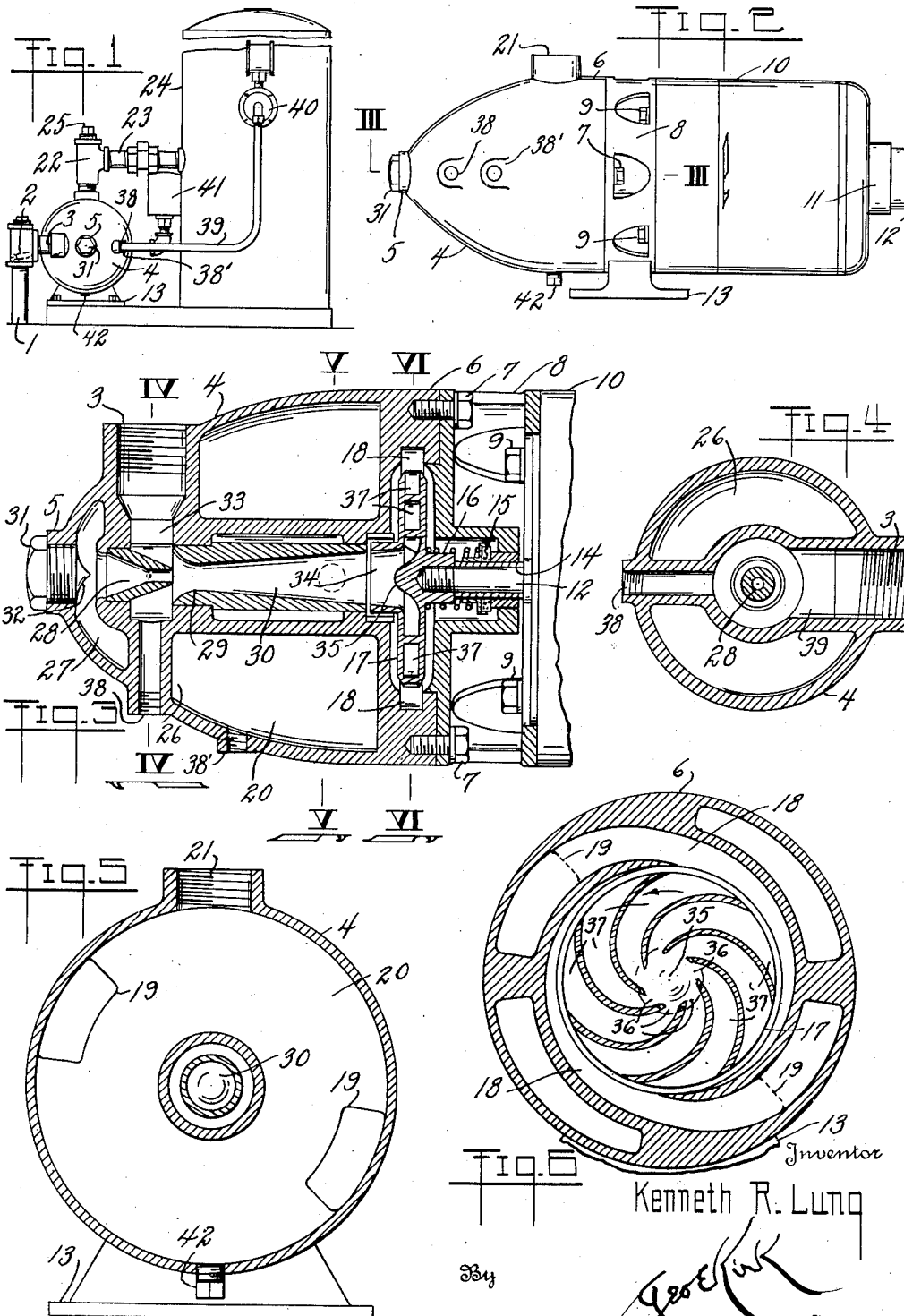
March 3, 1942.

K. R. LUNG

2,274,987

SELF-INJECTOR ROTARY PUMP

Filed Jan. 27, 1941



Kenneth R. Lung

Attorney

UNITED STATES PATENT OFFICE

2,274,987

SELF-INJECTOR ROTARY PUMP

Kenneth R. Lung, Kendallville, Ind., assignor to
Flint & Walling Manufacturing Co., Inc., Ken-
dallville, Ind., a corporation of Indiana

Application January 27, 1941, Serial No. 376,015

1 Claim. (Cl. 103—87)

This invention relates to injector impeller heads for motors.

This invention has utility when incorporated in an impeller unit having a coaxial injector therewith.

Referring to the drawing:

Fig. 1 is an end elevation of the unit incorporated in an assembly for pressure maintenance as in household or rural water supply systems;

Fig. 2 is a detail view in side elevation of the fixture or unit as mounted with the motor;

Fig. 3 is a section on the line III—III, Fig. 2, through the fixture or motor head of this unit;

Fig. 4 is a section on the line IV—IV, Fig. 3, showing the intake and control connections;

Fig. 5 is a section on the line V—V, Fig. 3, showing the reserve chamber to the discharge; and

Fig. 6 is a section on the line VI—VI, Fig. 3, showing the impeller unit.

In carrying out the invention herein, riser line 1 from a well, cistern, or other water source, may have its lift value enhanced by the unit herein. In this line 1 is check valve 2 against return of water or liquid to the line 1. From this line 1 past the check valve 2 there is entrance by way of port 3 to housing or extension 4 of reduced or tapered form toward portion 5. Remote from the portion 5 is a maximum diameter region 6 assembled by bolts 7 with spacer 8 of ring form mounted by bolts 9 directly on housing 10 of a motor.

This motor has bearing 11 for shaft 12. The spacer 8 has pedestal or foot portion 13 as the mounting for the motor. The shaft 12 of the motor has bronze seal ring 14 in the spacer 8. Packing or gland 15 is to preclude flow of liquid between the motor and the housing 4. Mounted on the terminus of this shaft 12 as protruding through the spacer 8 is rotor 16 providing impeller 17 in this direct connection of rotary pump device with the motor 10. This rotary impeller 17 spills into arc discharge ways 18 having spill openings 19 into chamber 20 of the housing 4. Rising from the housing 4 is port 21 on which may be mounted fitting 22 with line 23 to carry discharge to storage tank 24 or other distribution system as may be appropriate. This fitting 22 has plug 25 which is a readily removable means to permit priming of the pump or unit by pouring water thereinto. This not only effects charging of the chamber 20 but will permit flow into the region of the impellers as well as by way of region 26 (Fig. 4) from the chamber 20 to region 27 (Fig. 3), and then through nozzle 28 to deliver

under momentum flow of liquid past narrowing intake 29 into expanding taper 30 of this Venturi injector.

To permit inspection and ready clearing of this nozzle 28, there is plug 31 having tapered terminus 32 as a feature to promote against eddies building up of flow velocity from the pressure chamber 20 in operation into and through the nozzle 28 and as flowing into the sections 29 and 30 of the venturi, thereby to draw in flow of liquid as water by passage 33 from the port 3. This injector action for water supply in through the tapering expanding Venturi passage 30 continues therefrom into Venturi extension expansion portion 34 fixed with the impeller 17 so that this discharge of water or liquid as promoted from the nozzle 28, and including therewith water from the riser line 1, has a tendency for centrifugal action as to the nose 35 coaxial with the impellers and therefrom to flow into ports 36 and through the enlarging arc ways 37 of the impeller 17 to be thrown thereby into the passage 18 and thus be delivered in volume under pressure into the chamber 20.

In practice, this unit may handle two or three times the volume through the impeller than is drawn in from the riser line 1. However, this injector action not only means this pump may act consistently with a minimum of relatively moving parts and accordingly lack of upkeep requirement but also to readily lift in the line 1 as much as 16 or 18 feet or even, with reduced volume, up to 24 or 28 feet. Furthermore, the delivery into the reservoir 24, even with a $\frac{1}{4}$ horse power unit, has been effected up to 50 pounds pressure with the impeller diameter $3\frac{3}{8}$ inches in this single stage rotary pump lifting 20 feet.

This installation as worked out for automatic air control may have from port 38 connection by line 39 to diaphragm air pump 40 assembled on the tank 24. This means as the impeller unit is started and stopped, this diaphragm may function to introduce an air cushion into the tank 24 as a pressure maintenance in drawing off water from this tank say as in service use for household purposes. From chamber 20 port 38 provides connection to pressure switch unit 41 coacting at fall of the pressure in the system for cutting in the motor 10 as the pressure gets below, say 15 or 20 pounds, and to cut out such motor as the pressure may be built up, say to 40 or 45 pounds.

Upon occasion there may be desire to drain this pump fixture, and to such end plug 42 may

allow run off of material as liquid from the chamber 20. This has advantage not only for cleaning the pump prior to priming but to remove water therefrom as occasion may arise, say to avoid freezing.

What is claimed and it is desired to secure by Letters Patent is:

For a pump structure, a ring, an electric motor flush with and mounted axially of and extending one way from the ring, a rotary pump 10

also flush with and mounted on the ring and extending oppositely from and coaxial with the motor, whereby the motor and pump are aligned units on opposite sides of the ring, said ring, motor and pump being of the same diameter at the respective points of juncture therebetween, whereby said ring, motor and pump assemble to make a substantially smooth wall cylindrical portion.

KENNETH R. LUNG.