J. J. GILDAY.

AIR PUMP.

APPLICATION FILED OCT. 29, 1906.

907,591. Patented Dec. 22, 1908.

Fig-1-

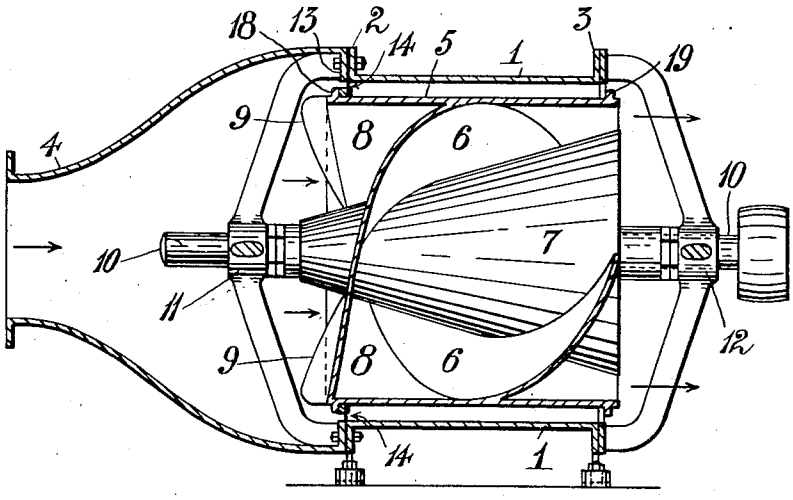
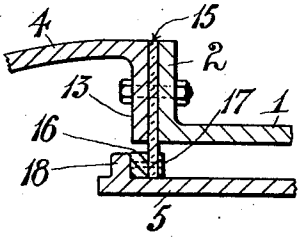


Fig-2-



Witnesses

Walter C. Hart

William G. Holden

Inventor

by James Joseph Gilday

Edw. G. Wallerstorf Sons

Attorneys

UNITED STATES PATENT OFFICE.

JAMES JOSEPH GILDAY, OF BERRINGA, VICTORIA, AUSTRALIA.

AIR-PUMP.

No. 907,591. Specification of Letters Patent. Patented Dec. 22, 1908.

Application filed October 29, 1906. Serial No. 341,159.

To all whom it may concern:

Be it known that I, JAMES JOSEPH GILDAY, a subject of the King of Great Britain, residing at Berringa, in the State of Victoria, Australia, miner, have invented an Improved Air-Pump, of which the following is a specification.

This invention relates to certain new and useful improvements in air pumps and the object thereof is to provide a pump of such class with means as hereinafter set forth whereby the air is subjected to little or no frictional resistance during its passage through the pump.

A further object of the invention is to provide an air pump with a rotatable means in a manner as hereinafter set forth which when rotating in one direction acts as a means for drawing the air through the pump but when reversed in the opposite direction converts the pump into a blower.

A further object of the invention is to provide an air pump which shall be simple in its construction, strong, durable, efficient in its use, conveniently operated and inexpensive to manufacture.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings:—Figure 1 is a longitudinal vertical section through the pump, and Fig. 2 an enlarged sectional detail of the gland.

Referring now to these drawings, 1 represents an external stationary cylinder or casing provided with flanges 2, 3 at its ends and with a removable flared inlet pipe 4 at the intake end. Within said stationary casing is a revoluble cylinder or liner 5 having therein a screw 6 and a central tapering core or boss 7 said screw and core being formed integral with their cylinder or liner. The core 7 tapers from the outlet to the intake end of the pump and the pitch of the screw increases from the intake end to the outlet as shown in Fig. 1. By this arrangement the width of the annular passage 8 between the core and the cylinder is gradually reduced towards the outlet and the area of the latter is much less than that of the intake, consequently the air is gradually compressed as it passes through the pump and is finally discharged with a greatly increased velocity.

The increasing pitch of the screw is an important feature of the pump as it imparts a throw, the strength of which increases correspondingly with the compression of the air in the cylinder. The front edges 9 of the screws preferably project a little beyond the front end of the revoluble cylinder in order to enable the pump to pick up the air more readily.

In Fig. 1 the revoluble cylinder is shown provided with a pair of screws but any number thereof may be employed such number being regulated according to the capacity of the pump.

The tapering core is provided with a central axle 10, the ends of which are mounted in bearings 11, 12, the latter being secured directly to the flange 3, at the outer end of the stationary casing 1 while the other 11 is preferably secured to a flange 13 on the flared inlet pipe 4 and said flange 13 is then bolted to the flange 2 on the inner end of the casing.

In order to prevent the air escaping back between the casing and the revoluble cylinder, a removable gland 14 is provided at the intake end thereof. Such gland comprises a thin wide ring of rubber or other suitable material 15 which is clamped at its inner edge between a gun-metal ring 16 and a washer or stiffening ring 17 and said gun-metal ring is adapted to abut against an external collar 18 on the intake end of the revoluble cylinder 5. The outer edge of said rubber ring is clamped between the respective flanges 13, 2 of the inlet pipe and the casing. The gun-metal ring 16 fits comparatively loose on the cylinder and when the pump is started the first rush of air passing between the cylinder and casing forces the said ring against the collar 18 and makes an air-tight fit thus preventing air from slipping back to the intake.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is,—

1. An improved pump comprising a revoluble cylinder having one or more internal screws attached to or formed integral therewith, said screw or screws having a gradually increasing pitch from the air intake, a cen-

tral core formed integral with said screw or screws tapered from the air outlet, an axle on said core journaled in removable bearings on a stationary casing around the cylinder, an inlet pipe attached to said casing and a gland between the latter and said cylinder substantially as set forth.

2. An air pump comprising a rotatable cylinder, an inner conical core having helically arranged blades connecting the cylinder with the core, the said blades decreasing in depth in the direction of the air current, and the space between the blades decreasing from the inlet to the outlet end of the pump, a casing surrounding the cylinder, and a flexible gland carried by the casing and in contact with the inlet end of the cylinder.

3. An air pump comprising a stationary casing, a rotatable cylinder within the same, spider brackets fixed to the casing and forming bearings, a rotatable shaft supported in the bearings, a conical core mounted on the shaft, blades helically arranged on the core and having connection with the rotatable cylinder, the pitch of each blade continuously increasing in the direction of the air current and the depth thereof gradually diminishing in the same direction, and a flexible gland associated at the inlet end of the pump between the casing and the cylinder.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES JOSEPH GILDAY.

Witnesses:
EDWARD N. WATERS,
WILLIAM H. WATERS.