

No. 819,830.

PATENTED MAY 8, 1906

J. T. WILKIN.
GAS EXHAUSTER.

APPLICATION FILED JAN. 30, 1905.

Fig. 2

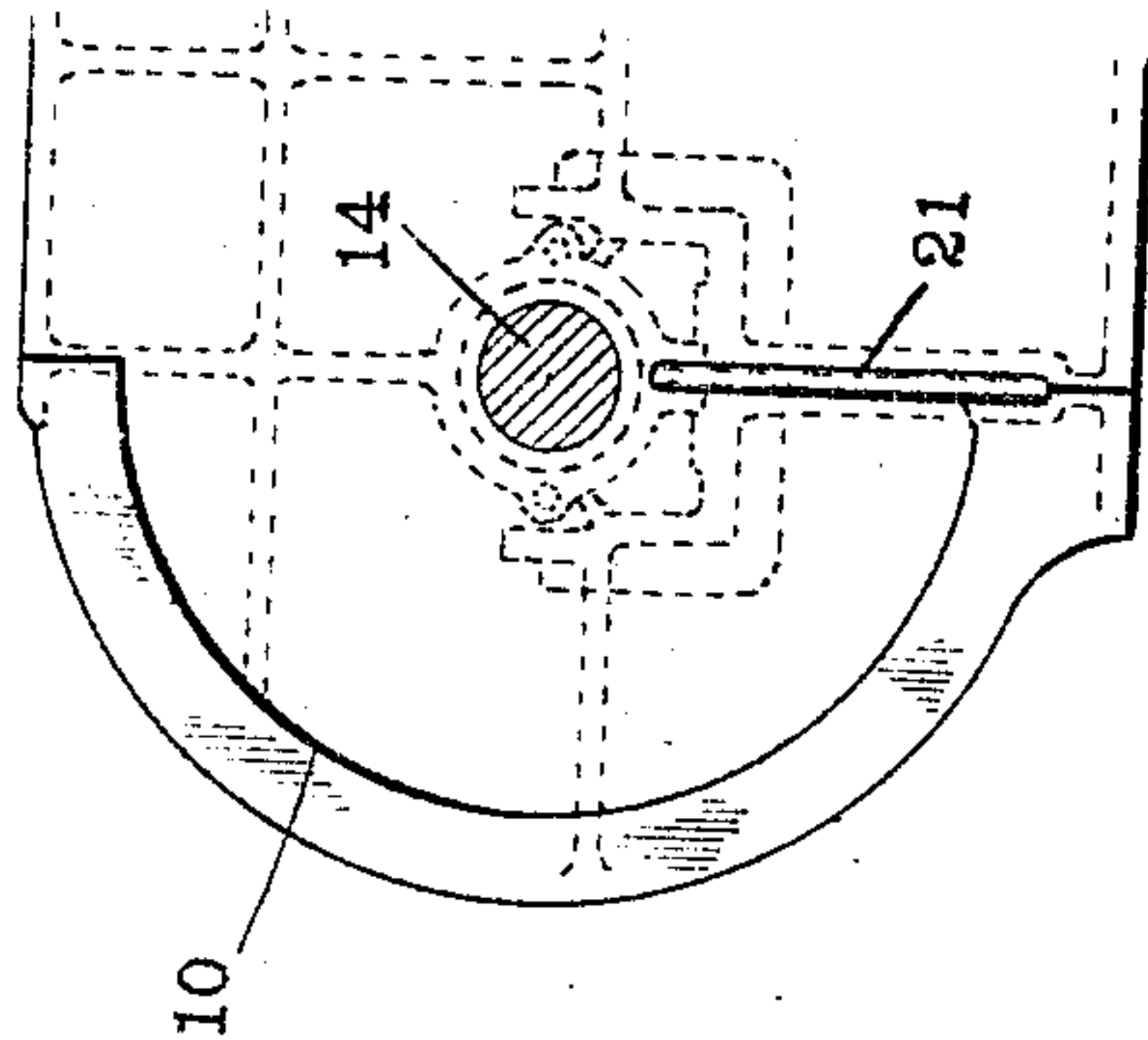


Fig. 4

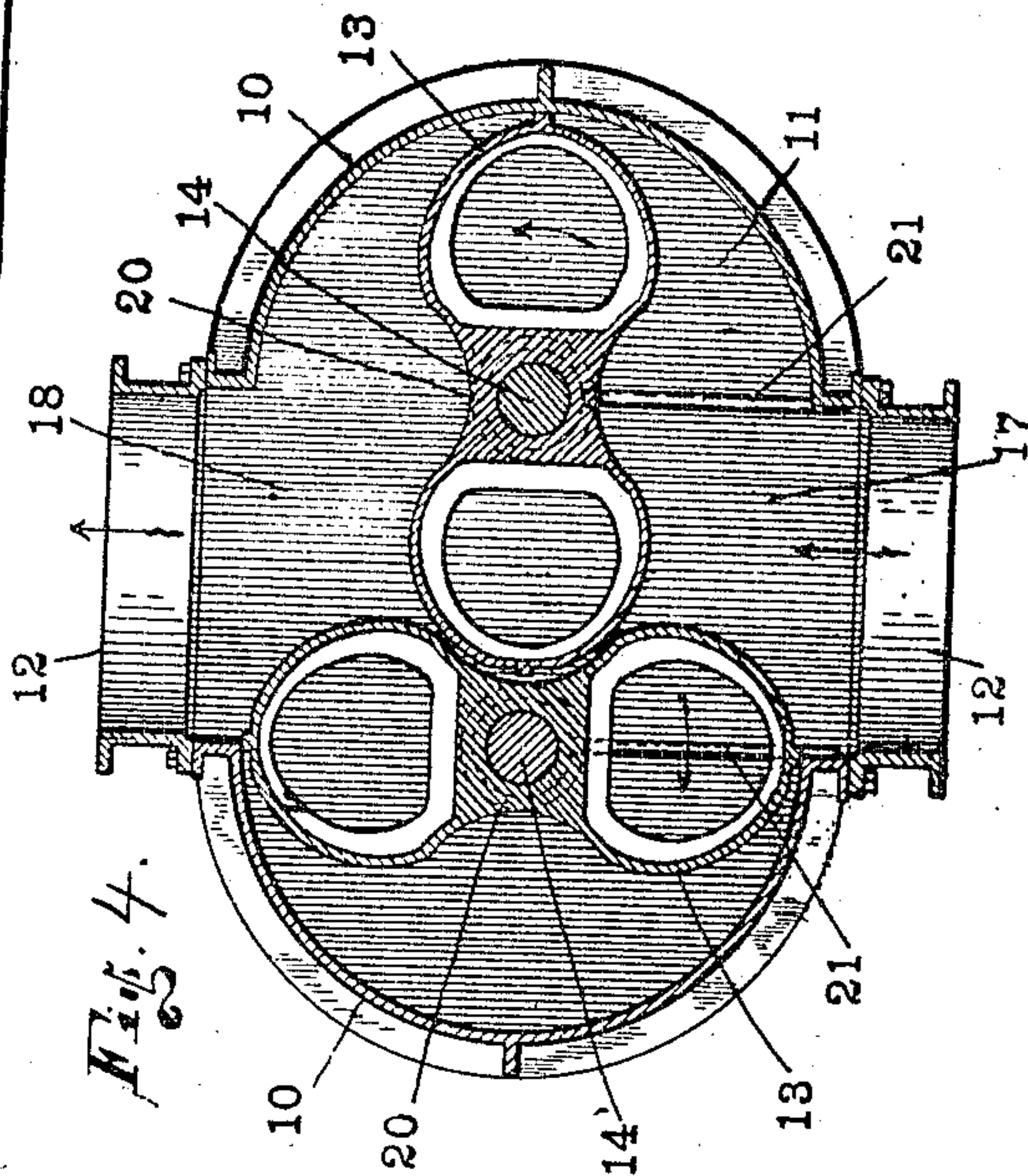


Fig. 1

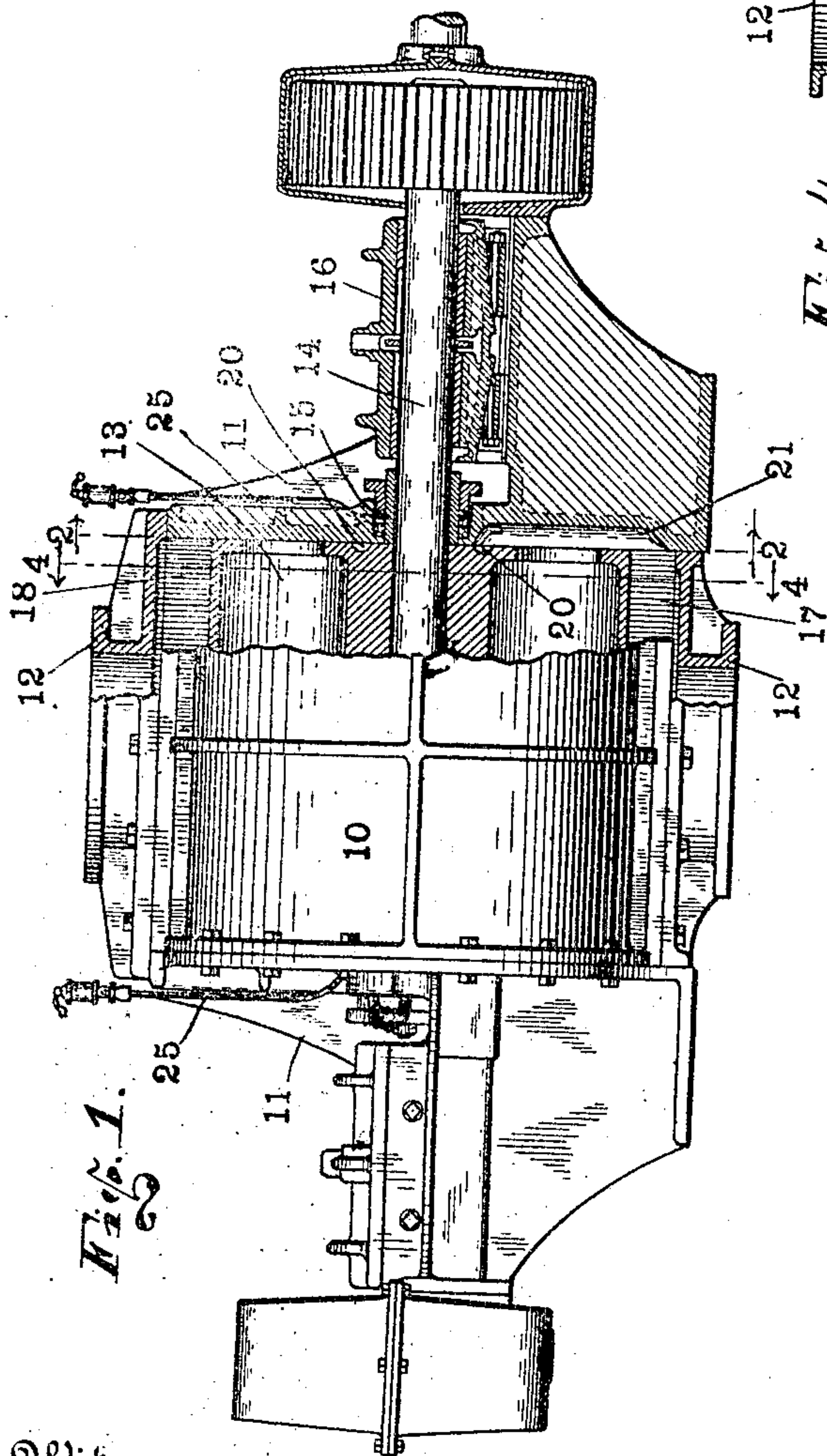
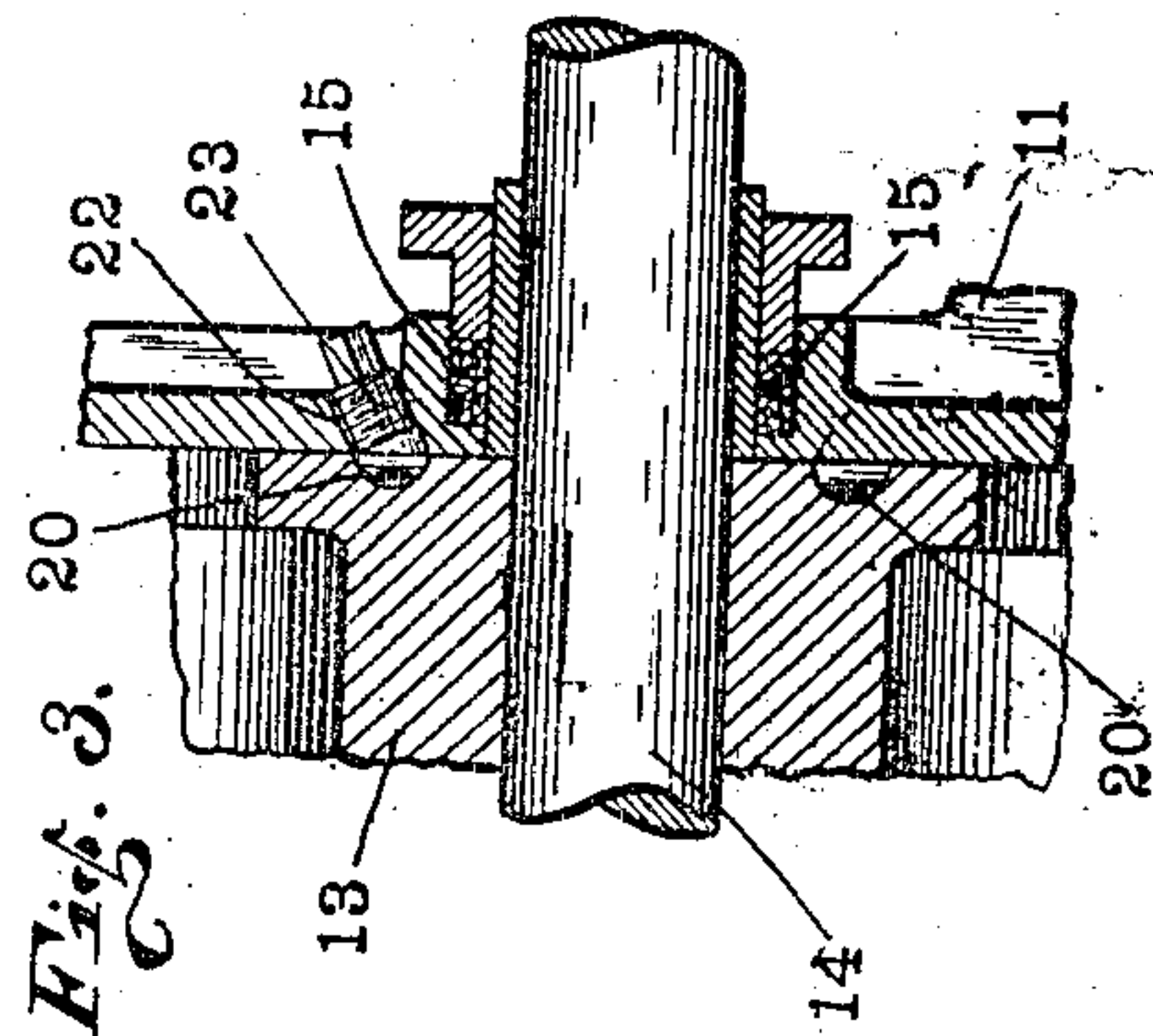


Fig. 3



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UNITED STATES PATENT OFFICE.

JOHN T. WILKIN, OF CONNERSVILLE, INDIANA.

GAS-EXHAUSTER.

No. 819,830.

Specification of Letters Patent.

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Application filed January 30, 1905. Serial No. 243,214.

To all whom it may concern:

Be it known that I, JOHN T. WILKIN, a citizen of the United States, residing at Connerville, in the county of Fayette and State of Indiana, have invented certain new and useful Improvements in Gas-Exhausters, of which the following is a specification.

In the use of exhausters of the two-impeller type for pumping gases, especially illuminating and fuel gases, there is unavoidably some leakage between the ends of the impellers and the inclosing casing, and it is found in practice that this leakage passes to the stuffing-boxes around the shafts at their points of emergence from the casing and that it produces a hardening of the packing of such character as to render it very difficult to keep these stuffing-boxes tight and lubricated.

In the operation of such machines they cannot ordinarily be stopped to be repacked, and as any attempt to repack the stuffing-box during operation results in considerable temporary leakage and a consequent almost unbearable stench it is not unusual to find that the operator continues to tighten up the packing-gland even after the packing has become hardened, so that the hardened packing is forced into the shaft, and consequently cuts it very seriously and requires too much power to operate it.

The object of my present invention is to produce a simple construction by means of which any leakage between the ends of the impellers and the end walls of the casing will be by-passed away from the packing-glands, preferably into the suction side, so that there will be no tendency for the gas to pass to the packing. As a consequence I am able to provide the packing-glands with gravity oiling devices.

The accompanying drawings illustrate my said invention.

Figure 1 is a side elevation, in partial axial section, of a pump of the class described provided with my improvement. Fig. 2 is an elevation of the inside of a part of an end plate; Fig. 3, a detail axial section on an enlarged scale, and Fig. 4 a section on line 4 4 of Fig. 1.

In the drawings, 10 indicates the semicylindrical sides, 11 11 the end plates, and 12 the top and bottom plates, of a two-impeller rotary exhauster of any ordinary type, such as may be commonly found in the market. Mounted in the casing thus formed are two coacting two-lobe impellers 13 13, which are

carried by shafts 14 14, which extend through suitable packing-glands 15, formed in the end plates 11, and are journaled in suitable bearings 16. All of the construction thus far described is common and ordinary, and the two impellers coact together to form when rotated in the direction indicated by the arrows in Fig. 4 a suction-space 17 and a pressure-space 18.

The ends of the impellers fit closely against the inner face of the end plates 11, and the leakage occurs between these parts, passing from the pressure side toward the shaft. This pressure is sufficient to force the gas outward into the packing-gland 15, so that as a consequence it has heretofore been impossible to provide any system of gravity-oiling for this packing-box.

My invention consists of a by-pass chamber between the ends of the impellers and the adjacent end plates and connecting this chamber either with the suction side 17 of the pump, as shown in the drawings, or connecting said chamber to the outside of the casing.

In the present drawings I have shown this by-pass chamber 20 as formed by an annular groove formed in the hub of the impeller around the shaft 14. The chamber communicates with a groove 21, formed in the lower side of the inner face of the plate 11 and extending downward to a point where it is continuously open into the suction-chamber 17. This is probably the most advisable and practical arrangement, and I consider it desirable that the chamber 20 be at all times open into the suction-chamber; but this is not necessarily so, as it may be of such length as to be only uncovered twice in each revolution of each impeller by the passage of the lobes of the impeller over and away from the slot.

In the operation of machines of this type there is a considerable residuum from the gas deposited in the form of a sticky mass, and it is therefore desirable that some means be provided for readily cleaning the by-pass chamber. In order to do this, I provide a perforation 22 in the end plate 11, which registers with the annulus 20, and this perforation is closed by a screw-plug 23, the arrangement being such that by withdrawing the screw-plug 23 during the operation of the pump a scraper may be inserted to scrape the walls of the annular groove 20 as the impeller rotates.

In operation any gas which is forced from the pressure side inward toward the shaft between the end of the impeller and the end plate will pass into the annular groove 20 and from thence pass freely into the suction-chamber 17 through the groove 21, as this will be the line of least resistance, and the leakage will not, therefore, pass farther inward toward the shaft and from thence outward into the packing 15 for the reason that the packing will be under atmospheric pressure, while the pressure in chamber 17 will be somewhat less. As a consequence by this arrangement I find it possible to provide the packing 15 with an ordinary gravity oiling device 25, so that the packing may be kept continuously moist, thus insuring a tight joint and good lubrication.

I claim as my invention—

- 20 1. In an exhaustor of the two-impeller type, a by-pass chamber formed between the end of an impeller and the adjacent end plate of the casing and communicating with the suction side.
- 25 2. In an exhaustor of the two-impeller type, a by-pass chamber formed between the end of an impeller and the adjacent end plate of the casing and communicating with the suction side, a stuffing-box around the shaft, and an oiling device therefor.
- 30 3. An exhaustor having an inclosing casing and a pair of lobed impellers rotatably mounted therein and having an annular groove formed in the end of an impeller adjacent the end plate, and a passage leading from said groove to the suction side of the exhaustor.
- 35 4. In an exhaustor having an inclosing casing and a pair of lobed impellers rotatably mounted therein and having an annular groove formed in the end of the impeller adjacent each end plate, a passage leading from each groove to the suction side of the exhaustor, a stuffing-box around the shaft of each impeller, and an oiling device therefor.
- 40 5. In an exhaustor having an inclosing casing and a pair of lobed impellers rotatably mounted therein and having an annular groove formed in the end of the impeller adjacent each end plate, a passage leading from each groove to the suction side of the exhaustor, and means permitting access to each annular groove through the casing.
- 45 6. In an exhaustor of the two-impeller type, a by-pass chamber formed between the end of the impeller and an adjacent end plate of the casing, said by-pass chamber opening to a region of less pressure than that in the pressure side.
- 50 7. In an exhaustor having an inclosing cas-

ing, and a lobed impeller rotatably mounted therein and having an annular groove formed in the end of the impeller adjacent the end plate, a stuffing-box around the shaft of the impeller, and a passage leading from the said annular groove to a region of less pressure than that in the pressure side.

8. In a device of the class described, the combination, with a suitable inclosing casing, of a pair of coaxing lobed impellers mounted therein and separating the casing-chamber into two sides, and a by-pass chamber formed between the end of an impeller and the adjacent end plate of the casing and communicating with the casing-chamber upon one side of the impellers.

9. In a device of the class described, the combination, with a suitable inclosing casing, of a pair of coaxing lobed impellers mounted therein and separating the casing-chamber into two sides, and a by-pass chamber formed between each end of each impeller and the adjacent end plate of the casing, all of said by-pass chambers communicating with the casing-chamber upon one side only of the impellers.

10. In a device of the class described, the combination, with a suitable inclosing casing, of a pair of coaxing lobed impellers mounted therein and separating the casing-chamber into two sides, shafts carrying said lobed impellers projecting through the end plates of the casing, and an annular by-pass chamber formed between each end of each impeller and the adjacent end plate and surrounding the adjacent shaft, all of said by-pass chambers communicating with the casing-chamber upon one side only of the impellers.

11. In a device of the class described, the combination, with a suitable inclosing casing, of a pair of coaxing lobed impellers mounted therein and separating the casing-chamber into two sides, shafts carrying said lobed impellers projecting through the end plates of the casing, and an annular by-pass chamber formed between each end of each impeller and the adjacent end plate and surrounding the adjacent shaft, all of said by-pass chambers communicating with the casing-chamber upon one side only of the impellers, a stuffing-box around each shaft, and an oiling device therefor.

In witness whereof I have hereunto set my hand and seal at Connersville, Indiana, this 26th day of January, A. D. 1905.

JOHN T. WILKIN. [L. S.]

Witnesses:

HYATT L. FROST,
RUBY M. NAVE.