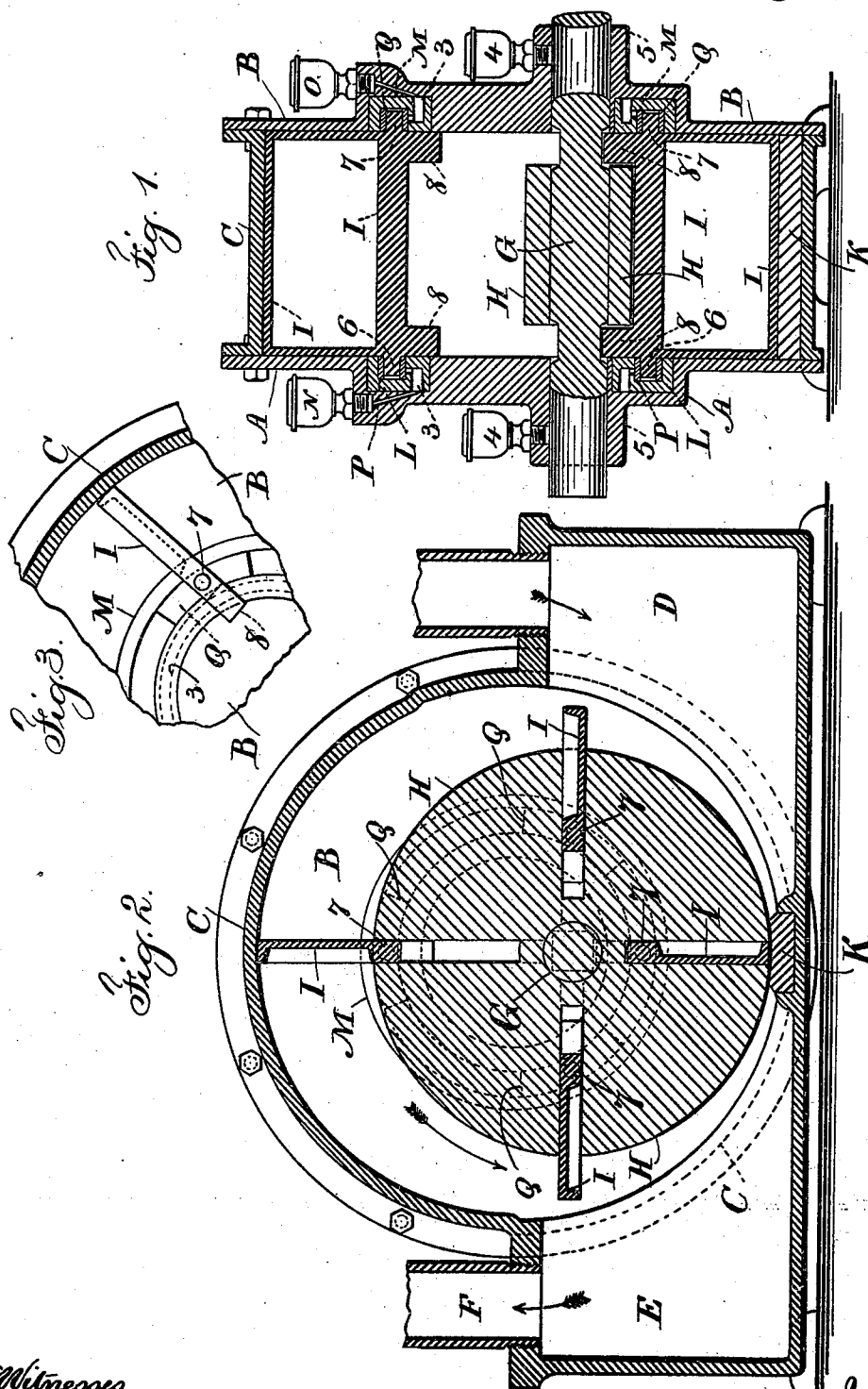


(No Model.)

E. P. REICHELTM.
ROTARY BLOWER.

No. 502,890.

Patented Aug. 8, 1893.



Witnesses
Charles Smith
J. Staub

Inventor
E. P. Reichhelm
per Lemuel W. Torrell atty.

UNITED STATES PATENT OFFICE.

EDWARD P. REICHHELM, OF JERSEY CITY, NEW JERSEY.

ROTARY BLOWER.

SPECIFICATION forming part of Letters Patent No. 502,890, dated August 8, 1893.

Application filed February 18, 1893. Serial No. 462,839. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. REICHHELM, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Rotary Blowers, of which the following is a specification.

Numerous blowers have been made in which the rotating shaft is eccentric to the case of the blower and fans or blades have been projected so that the outer edges of such fans or blades have traveled in contact with the interior of the eccentric case, there being an abutment at the opposite side coming in contact with the surface of a cylinder that is concentric to the rotating shaft. In my present improvements I make use of a ring at each edge of the series of fans, such rings being grooved and receiving within them ring segments to which the blades are pivoted, so that the blades are projected or retracted in the revolution and the blower can be driven at great speed and is substantially noiseless, because the grooved rings and ring segments revolve together and they can be kept thoroughly lubricated, and there is a large extent of wearing surface, so that the parts do not become loose, and the weight of these parts is so balanced that the centrifugal action does not tend to produce friction.

In the drawings, Figure 1 is a section longitudinally of the power shaft. Fig. 2 is a section transversely of the same, and Fig. 3 is a detached view of one of the fans and part of the case and ring.

The case is composed of the heads A and B with the intermediate arch or cylindrical segment C and the inclosure D into which air is admitted to flow freely, and the inclosure E from which the air is driven through any suitable pipe or connection F. The driving shaft G is not central to this case but is below the center from which the segment C is struck, and such shaft G is in suitable bearings 5 upon the heads A and B of the case, and the oil cups 4 may be applied to said bearings.

Upon the driving shaft G is a cylindrical drum H which is slotted radially for the re-

ception of the fans I, and this drum H may be made hollow to a greater or less extent to lessen the weight, but its cylindrical surface is unbroken except at the slots that receive the fans, and the surface of this drum H is in contact with the abutment K which is preferably upon the bottom of the case and immediately below the driving shaft G, so that the drum H and the abutment K form a separation between the inlet inclosure D and the exit inclosure E.

In the heads A and B there are annular recesses for the reception of the rings L and M which fit into the recesses but they are free to rotate therein, and it is advantageous to make these rings L and M hollow or with annular recesses 3 which may contain oil or other lubricating material supplied into the recesses containing these rings by the oil cups N and O, and in each ring L or M there is also an annular channel receiving the ring segments P and Q, which segments are provided with holes for the reception of the pivots 6 and 7 of the fans I. These fans I are preferably formed with the legs 8 extending toward the driving shaft G so as to pass at each end of the central or hub portion of the drum H, and they may pass directly to the surface of the driving shaft G, but I prefer to make the driving shaft G at the portions that are adjacent to the legs 8 flattened or polygonal, so that the legs 8 may be longer than could otherwise be employed without increasing the diameter of the case. These legs 8 become guides to steady the fans and prevent any risk of such fans binding in the slots within the drum H, and these fans I fit the slots in the said drum but can be moved freely outwardly or inwardly in such slots.

It will be noticed in Fig. 2 that the curved portion C of the blower case is of slightly larger diameter near the inlet inclosure D in order that the outer ends of the fans I may not come into contact with the interior surface of this cylinder segment C until after such fans have passed by the inlet inclosure D, and the length of the curved portion C of the case is greater than the distance between the outer edges of two of the fans; hence one

fan rises and comes into contact with the interior surface of such case before the edge of the preceding fan leaves such cylindrical surface of the case, thereby, as the driving shaft 5 G is rotated in the direction of the arrow, the fans I cause a constant movement of the atmosphere through the case, driving such atmosphere from the inlet inclosure D and discharging the same into the exit inclosure E, 10 and in consequence of the rings L and M being concentric to the interior portion of the cylindrical segment C of the case, the ring segments P and Q within the annular grooves of such rings L and M cause the outer ends of the 15 fans to travel in contact with the interior surface of the portion C of the case, and such fans swing at their opposite edges on the pivots 6 and 7 in the ring segments P and Q, and as the shaft and drum H are revolved the fans 20 are carried around with and by the drum, and these in turn give motion to the ring segments P and Q within the annular grooves in the rings L and M, and these rings L and M are free to rotate by the contact of the ring segments with such rings, and the centrifugal force acting upon the fans is taken by the 25 ring segments P Q at opposite sides of and within the rings L and M, so that these rings L and M rotate freely within the heads A and B of the case, and the motion given to the ring segments within the annular recesses of the rings L and M only results from the difference in the positions of the pivots 6 and 7 in relation to the center around which the 35 rings L and M revolve; hence there is but little friction resulting from the movements of the ring segments within the annular recesses of the rings L M, and such rings L M are nearly balanced by the centrifugal action 40 upon the fans; hence this blower runs almost noiselessly and with but little power or friction and the same is easily lubricated, because the oil passing in from the cups N and O into the annular recesses containing the rings 45 L and M lubricates said rings and there are holes that pass the lubricating material from the outsides of the rings L M to the annular recesses in their inner faces, so as to lubricate not only the ring segments P Q and the 50 pivots 6 and 7, but also to lubricate the edges of the fans I where they slide in and out in the slotted drum H; hence the wear and friction are but little and are nearly equally balanced.

In consequence of the case having the inlet 55 and exit inclosures D and E, the edges of the fans are not in contact with any portion of the case before and after passing the abutment K until they come in contact with the inner surface of the segmental portion C of the case, and during that portion of the revolution the air is displaced from the inlet side and forced into the exit side of the case.

It is advantageous to lubricate the upper surface of the abutment K against which the

surface of the drum H is usually in contact, 65 so as to lessen friction, and the pad or surface of this abutment may supply lubricating material to the outer edges of the fans which pass in contact with the inner surface of the cylindrical segment C of the case. 70

I prefer the ring segments Q, because the wear and friction are more evenly distributed, but if these ring segments Q were dispensed with and the projecting pins 6 and 7 enlarged to the width of the slots in the rings L M, the 75 ring segments Q might be dispensed with, and it is sometimes advantageous to lengthen the pins 6 and 7 on one of the fans to enter holes in the rings L M, so that the rings L M will be rotated at the same speed as one of the fans. 80 Under all circumstances the rings L M revolve around the circular bearings in the heads A B of the case, and it is desirable that these circular bearings shall be as small as consistent with the eccentricity of the main shaft G, 85 so as to lessen the friction of the rings as they travel around the bearings. It will also be apparent that the ring segments upon one of the fans might be fastened within the curved rings L M so as to cause said rings to rotate 90 with the fan, and rollers might be provided upon the pins 6 and 7 instead of the segments Q.

I claim as my invention—

1. The combination with the driving shaft 95 and blower case, of a drum within the case and surrounding the driving shaft and slotted, and fans within the slots, rings with annular grooves introduced into annular grooves in the heads of the case, the fans within the slots 100 of the drum and provided with projecting pivots and ring segments receiving such pivots and being within the annular recesses of the rings, substantially as set forth.

2. The combination in a rotary blower, of a 105 case having heads with annular grooves in their inner faces, a driving shaft eccentric to the case, rings within the annular grooves of the case, a slotted drum around the driving shaft, fans within the slots, and connections 110 between the fans and the rings in the annular grooves in the heads of the case, substantially as set forth.

3. The combination in a rotary blower, of a 115 case, a shaft eccentric to the case, a slotted drum around the shaft, fans within the slots in the drum and having legs projecting toward the driving shaft, and rings concentric with the case to which the fans are connected for moving them in the slots of the drum, sub- 120 stantially as set forth.

4. In a rotary blower, the combination with the case having heads with annular grooves, of a shaft eccentric to the case, a drum 125 around the shaft slotted radially, fans within the slots of the drum and having legs projecting toward the driving shaft, recessed rings within the annular grooves in the heads

and pivotal projections upon the fans entering the recesses of the rings, substantially as set forth.

5 5. The combination in a rotary blower, of a case, a shaft eccentric to the case, a slotted drum around the shaft, fans within the slots and rings within the case and at each end of the fans and with which the fans are connected, said rings rotating around circular bearings in

the inner faces of the case heads and through 10 which the shaft passes, substantially as specified.

Signed by me this 13th day of February, 1893.

E. P. REICHHELM.

Witnesses:

LEMUEL W. SERRELL,
WILLIAM G. MOTT.