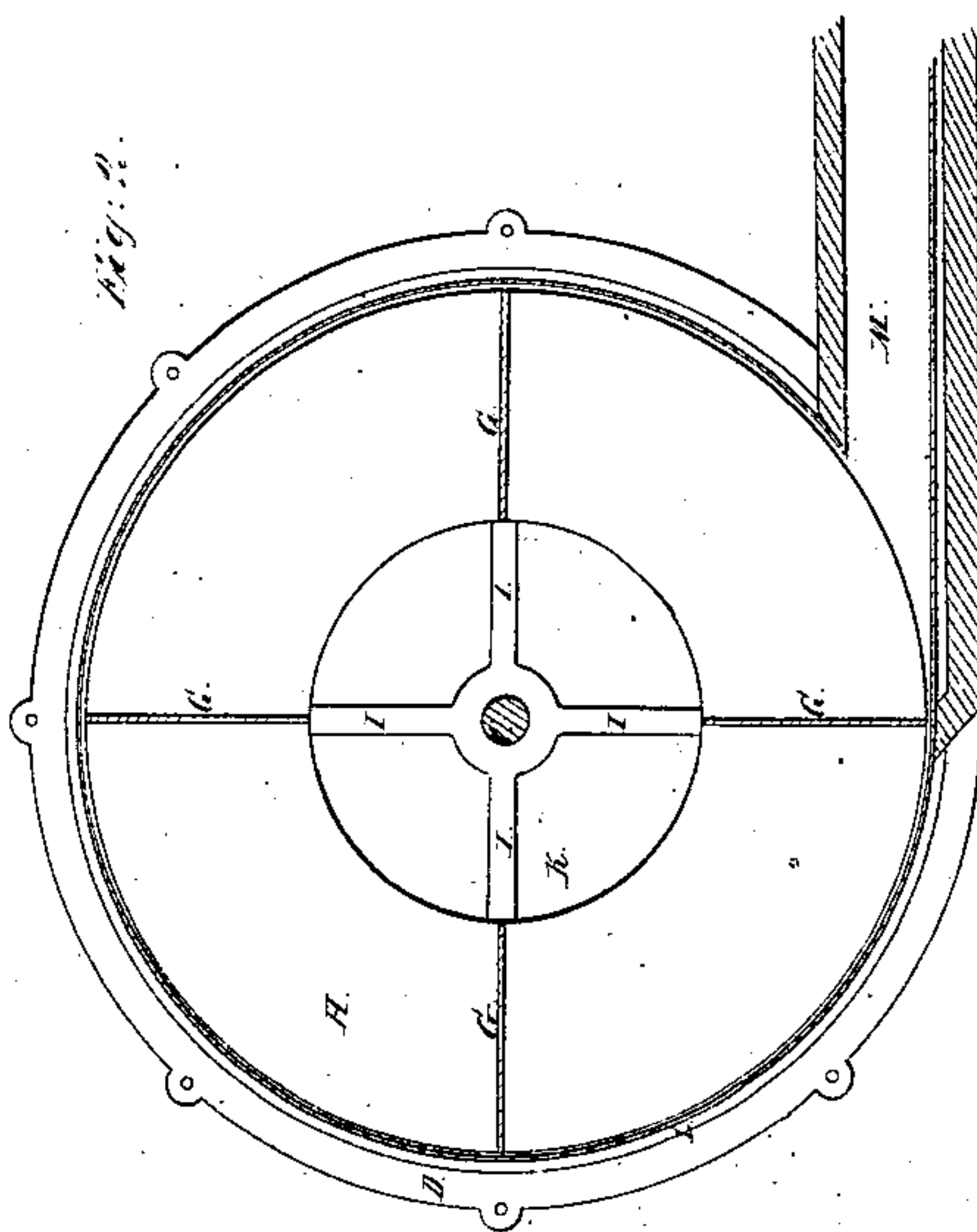
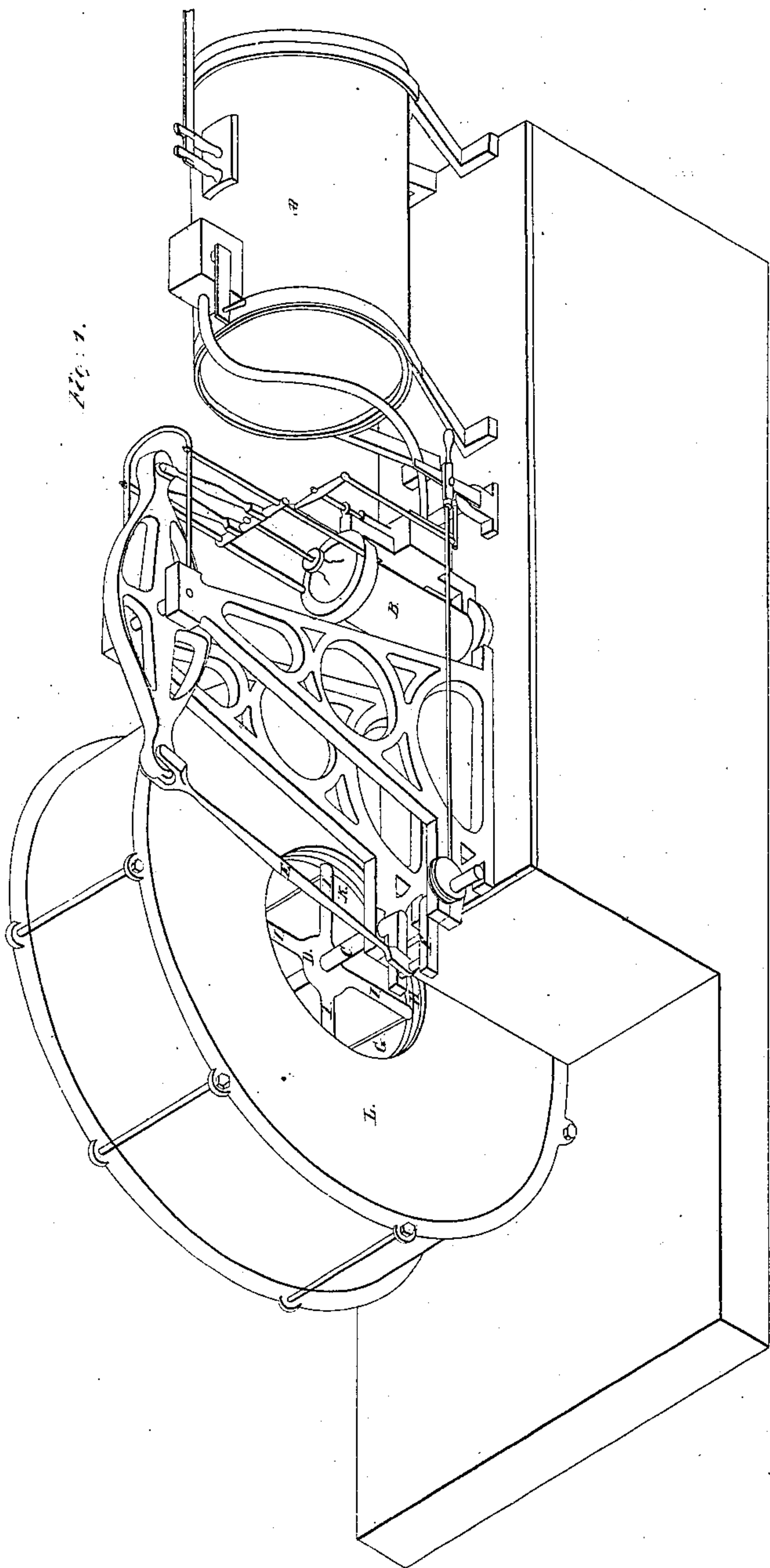


*I. P. Smith,*

*Rotary Blower,*

*No. 1,121.*

*Patented Mar. 14, 1846.*





# UNITED STATES PATENT OFFICE.

ISAAC P. SMITH, OF ORANGETOWN, NEW YORK.

## FAN-BLOWER.

Specification of Letters Patent No. 4,424, dated March 14, 1846.

*To all whom it may concern:*

Be it known that I, ISAAC P. SMITH, of Orangetown, in the county of Rockland and State of New York, have invented and discovered a new and useful Method of Arranging and Operating the Blowers used on Steamboats and used for Supplying the Blast to the Furnaces of Steam-Boilers, and that the following is a full, clear, and exact description of the principle or character thereof which distinguishes it from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the blower and the engine for driving it, and Fig. 2 a vertical longitudinal section through the blower and its case.

The same letters are used in all the figures to indicate like parts.

The fan blowers now used in steamboats for blowing the fires in the furnaces are generally made from two to three feet in diameter—the latter being the maximum—and to obtain the required quantity and velocity of blast necessary to supply the combustion very high velocities are required and therefore it has been necessary to resort to the use of a belt from a large wheel on the crank shaft of the auxiliary engine to a small pulley on the shaft of the fan. These dimensions and velocities have been the source of so much annoyance on steam boats as almost to counterbalance their usefulness. They occupy much room on account of the length of belt required to communicate motion from the crank shaft to the blower, and the current of air which enters the casing to supply the volume and velocity required must pass the apertures and be deflected by the fans at such high velocities as to produce a humming noise truly distressing to the passengers particularly to persons of delicate temperament.

It is not deemed necessary, in addition to these objections to enumerate others such as the constant difficulty of keeping the belt tight and of retaining it on the pulleys, and the necessity of frequent repairs arising from the breaking of the machinery by the slipping of the belt; the two pointed out above being the most prominent and essential. To avoid these objections has been the subject of much reflection among engineers

and others; the fans have been variously shaped and curved, wings have been adapted to the apertures in the casing to deflect the entering currents and thus prevent the humming noise; but all these attempts, while they have added greatly to the original cost and repairs, have not proved effectual.

These ends I have attained in the most simple and effective manner by my said improvement which consists simply in increasing the diameter of the fan blower and attaching it to the crank shaft of the auxiliary engine so that the required volume and velocity of blast may be acquired by a much less number of revolutions and the air is admitted and deflected under velocities which avoid entirely the disagreeable hum and noise of other blowers at the same time bringing the number of revolutions within the capacity of the crank shaft of the auxiliary engine so that the fans can be attached directly to it, thus effecting economy in the room occupied, the original cost of construction and repairs by dispensing with the belt and pulleys heretofore employed in forming the connection between the crank shaft and blower, which are so liable to derangement, and which add much to the noise.

In the accompanying drawings (A,) represents a small boiler for supplying steam to the cylinder (B,) of the auxiliary engine, which drives the shaft (C,) of the fan blower (D,) by means of the connecting rod (E,) that takes hold of the crank (F,) on the shaft (C,). The vanes (G) of the fan blower are attached to flat rings (H,) attached to the arms (I) which rings extend from the edge of the apertures (K,) to within a clearing distance of the inner periphery of the case (L). The air as it enters the apertures (K,) of the casing is gradually deflected and carried toward the vanes, and by centrifugal force toward the periphery with increasing velocity until it is discharged into and through the spout (M) which conducts it to the furnace of the boiler.

The diameter and width of the fan blower should be such as to supply the requisite volume and velocity of blast in proportion to the capacity of the furnace to be supplied, the rapidity of motion of the auxiliary engine giving one revolution for each full stroke of the engine. In the one which I have in full operation the diameter of the

fan is eight feet its width is two and a half feet, and its maximum velocity is one hundred revolutions per minute. From this example, any competent engineer will be  
5 able to give the requisite proportions for any furnace.

What I claim as my invention and desire to secure by Letters Patent is—

10 The combination of the various elements above enumerated as entering into the construction and working of fan blowers operated by auxiliary engines for supplying

the blast to the furnaces of steam boilers, which elements consist of the increased diameter of the fan blower, and putting the  
15 fan directly on to the crank shaft of the auxiliary engine,—the combination of these two elements being essential to the end contemplated and attained by my improvement and invention as above described.

ISAAC P. SMITH.

In presence of—

A. WILLIAMS,

EDMD. ELMENDORF, Jr.