2 Sheets—Sheet 1.

T. WISE.

Fan-Blower.

No. 203,306. Patented May 7, 1878.

FIG. 1.

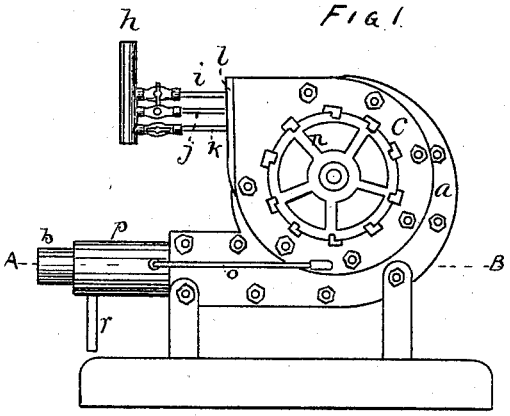


FIG. 2.

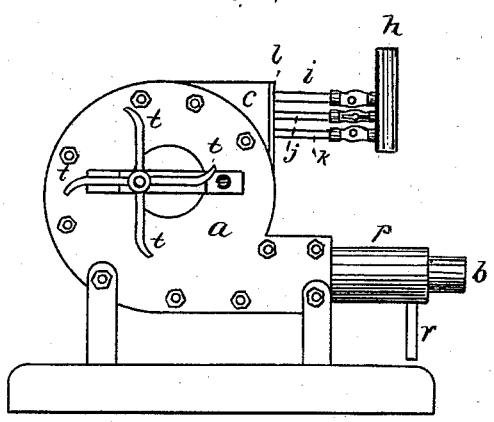
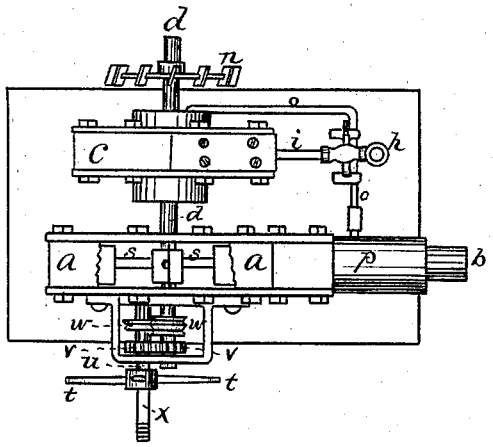


FIG. 3.



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2 Sheets—Sheet 2.

T. WISE.

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FIG. 4.

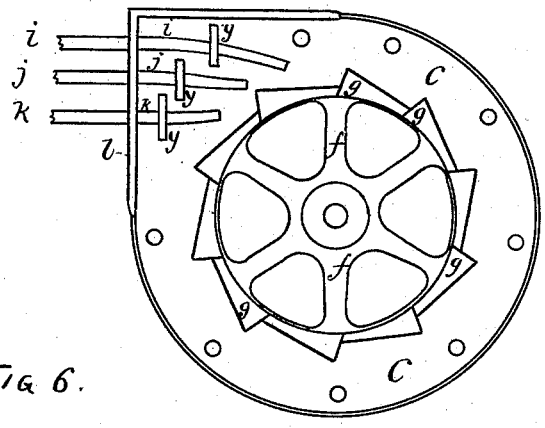


FIG. 6.

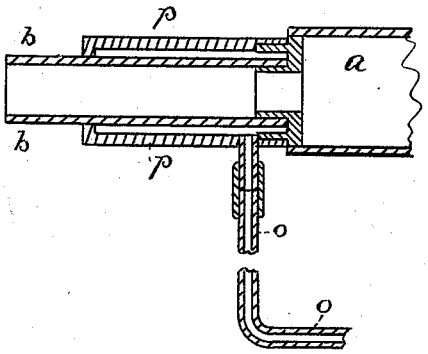
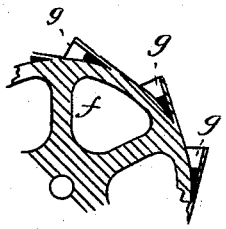


FIG. 5.



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UNITED STATES PATENT OFFICE.

THOMAS WISE, OF ASHLAND, MASSACHUSETTS.

IMPROVEMENT IN FAN-BLOWERS.

Specification forming part of Letters Patent No. **203,306**, dated May 7, 1878; application filed August 23, 1877.

To all whom it may concern:

Be it known that I, THOMAS WISE, of Ashland, in the State of Massachusetts, have invented a new and useful Improvement in Fan-Blowers, and in the mode of driving the same, of which the following is a specification:

The object of my invention is as follows: It relates to the class of blowers the fans whereof are attached to and revolve with a central shaft in an inclosing-case, which is circular in form, with a tangential outlet or flue, through which the blast is delivered, and known as "rotary blowers;" and my invention consists in a wheel secured either on such central shaft of the blower or connected therewith by gears, friction or otherwise, and constructed and arranged to be driven either by the impact of a steam-jet or series of such jets upon buckets, fans, or stops arranged around the periphery of such wheel, or by the reaction of the force of such steam-jet against the atmosphere.

It further consists in the devices by which the steam-jets are brought in contact with the buckets of the steam-wheel; and also in the means of heating the current of air which is delivered by the blower by the exhaust-steam after it has been employed to drive the blower, all as will be hereinafter more fully described.

Figure 1 is a side elevation, showing the shell or case, a modified steam-wheel mounted on the shaft outside the case, and a portion of the shell of the fan-blower and its delivery-pipe and steam-jacket. Fig. 2 is reverse side elevation, showing a reacting steam-wheel mounted on a counter-shaft, the blower-case in full view, and all the parts shown in Fig. 1, except the exhaust-pipe and the modified steam-wheel. Fig. 3 is a top or plan view of the parts shown in Figs. 1 and 2. Fig. 4 is a side elevation, similar to Fig. 1, but only showing the case of the steam-wheel with the side shell removed, and showing the wheel in elevation. Fig. 5 is a detached partial section of the steam-wheel, taken through the center, parallel with the planes thereof. Fig. 6 is a longitudinal section taken on line A B, Fig. 1, and showing the air-blast delivery-pipe and the steam-jacket.

In these drawings, *a* represents the case or shell of the air-fan *s*. *b* is the delivery-pipe, through which the air-jet is impelled by fan *s*. *c* is the shell or case of the steam-wheel. *d* is a shaft, journaled in suitable bearings formed upon or secured centrally to shells *a c*. Upon this shaft the air-fan *s* and steam-wheel *n* are secured, to revolve coincidently therewith. Upon this shaft, and within case *c*, the wheel *f* is mounted. The air-wheel *s*, which revolves in shell *a*, is also mounted upon the same shaft.

Around the periphery of wheel *f* are a series of "buckets" or cells, *g*. (Shown in Figs. 4 and 5.) *h* is a steam-pipe connecting with a steam-boiler. From this pipe a series of small pipes, *i j k*, provided with stop-cocks, lead through the portion of the shell *c* which is marked *l*, and are there arranged of such relative lengths and at such angles as shall cause their respective steam-jets to be delivered into said cells *g* at such angle of coincidence as shall produce the best result.

The percussive force of the steam imparts to the wheel a rotary movement, which, through the agency of the shaft *d*, is communicated in equal degree to the blower *s*. The recoil of the steam, when exerted upon wheel *f*, is arrested by the adjustable dash-plate *y*, secured upon the steam-pipes *i j k*, with their planes at right angles to the axial line of the pipes, and made adjustable thereon, so that the distance between the dash-plates and the wheel can be regulated as desired; and the force of the steam is thereby again returned and exerted upon the wheel. After the steam has thus exerted its force upon wheel *f* it passes through the exhaust-pipe *o* into the jacket *p*, which surrounds the air-pipe *b*, thereby heating the air, and thus causing a hot instead of a cold blast to be delivered into the furnace. From the jacket *p* the steam and condensed water pass off through the waste-pipe *r*.

Although I prefer the steam-wheel *f* to any kind which I have tested, I do not limit myself thereto; and I show two modifications of a steam-wheel. One is shown at *n*, with fans or buckets arranged oblique to its plane, and to operate within case *c*. Another wheel is shown mounted on the short shaft *u*, and formed with four hollow arms, each marked *t*. These arms are each formed with a curve in the direction of the circumferential line which they describe when rotated. Steam is conducted

to these arms through pipe *x*, which connects with shaft *u* by the usual stuffing-box; and when steam is introduced and issues from arms *t* the reacting force exerted against the atmosphere rotates the wheel. Instead of the short shaft *u*, this wheel may be mounted directly upon shaft *d;* but if the short shaft is employed its rotary motion may be imparted to shaft *d* either by the gears *v v* or by the friction-pulleys *w w*, respectively secured upon these shafts.

By my method of driving the fan-blowers I dispense with belts and the liability of their slipping or giving way during the progress of a blast; besides, my blower may be used in connection with a steam-boiler, whether there is an engine or not.

I make no claim to the fan-blower, nor do I claim, broadly, a steam-wheel or driving a rotary wheel by the force of steam applied to buckets at the periphery thereof; for I am aware that rotary steam-engines have been so constructed, but with this difference between them and mine: they were driven by the expansive force of confined steam, while mine is driven by the force of the free flow of a jet of steam, which would flow all the same whether the wheel revolved or not, while in those the steam only escapes as the moving of the parts periodically opens the escape-ports.

I claim as my invention—

1. The combination of the steam-blower, steam-wheel, the exhaust-pipe *o*, and the steam-jacket *p*, combined and arranged so that the air-blast, in its passage through the pipe *b*, shall be heated by the exhaust-steam, substantially as and for the purpose described and shown.

2. The steam-wheel herein described, provided with a plurality of pipes, *i j k*, each having an independent stop-cock, in combination with the blower, the exhaust-pipe *o*, and the steam-jacket *p*, all constructed, arranged, and operating as shown and described.

3. In combination with the steam-wheel and steam-jet pipes, the adjustable dash-plates *y*, substantially as and for the purpose herein shown and described.

THOMAS WISE.

Witnesses:
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