J. J. POWER.

DUST COLLECTOR.

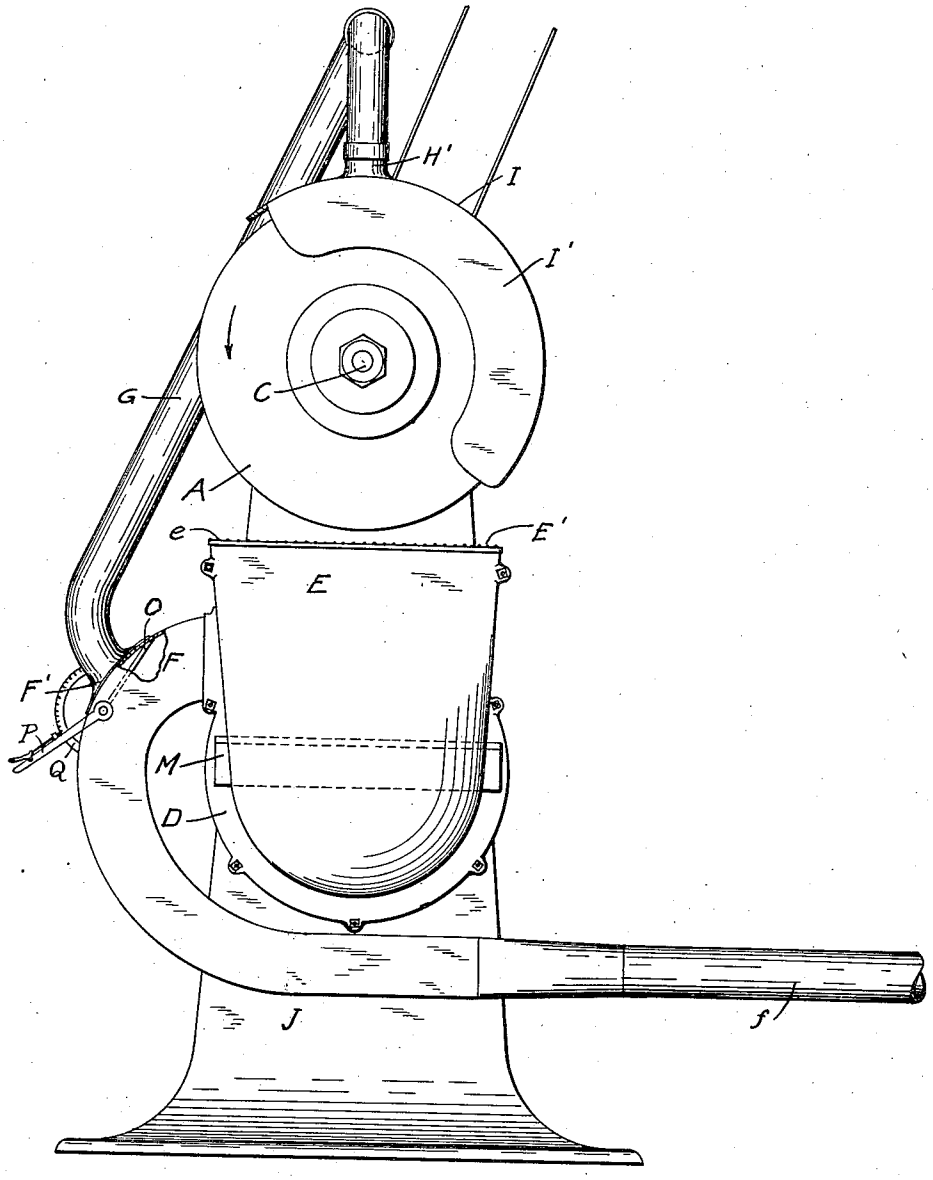
APPLICATION FILED DEC. 7, 1916.

1,308,961.

Patented July 8, 1919.

2 SHEETS—SHEET 1.

Fig. 1



INVENTOR

Witnesses

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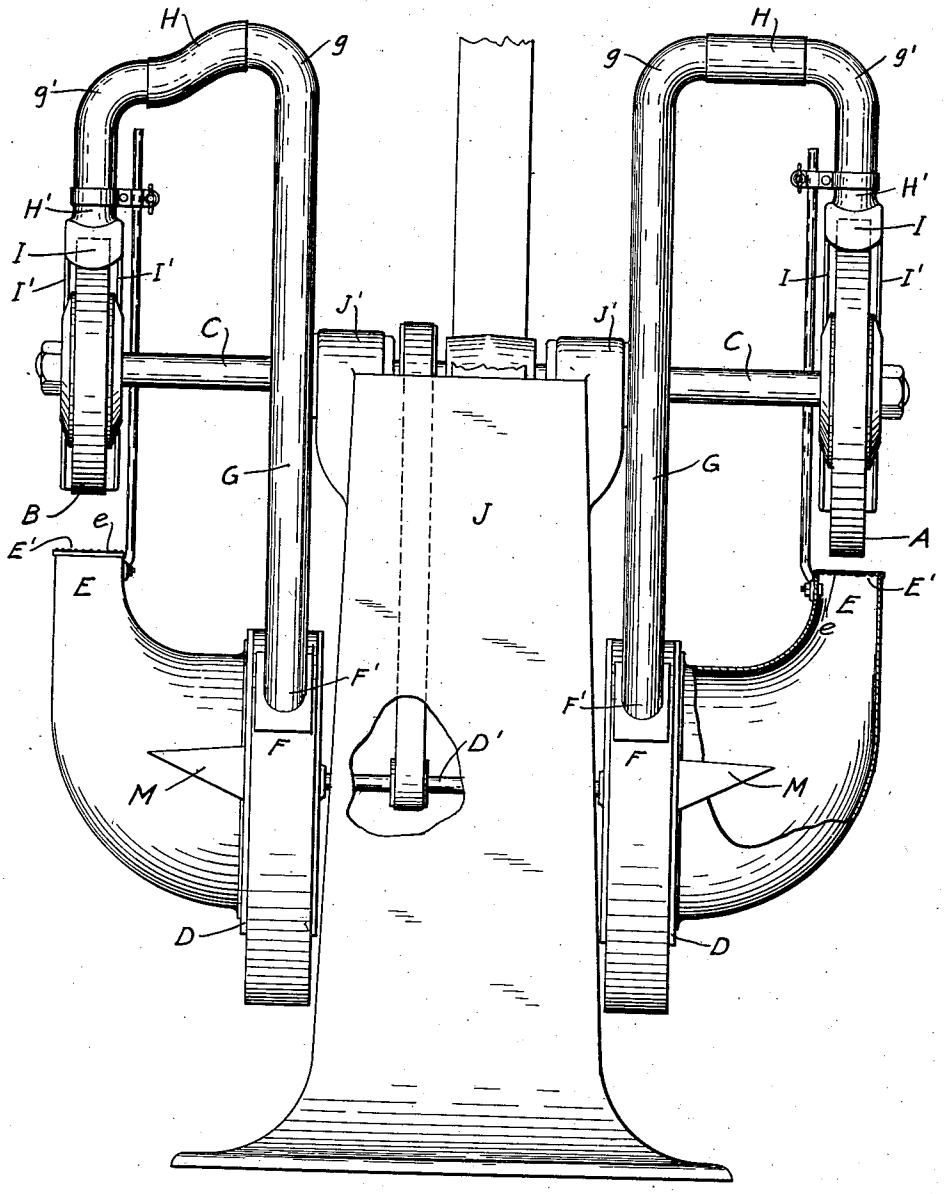
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2 SHEETS—SHEET 2.

Fig. 2.



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DUST-COLLECTOR.

1,308,961. Specification of Letters Patent. Patented July 8, 1919.

Application filed December 7, 1916. Serial No. 135,537.

To all whom it may concern:

Be it known that I, JEFFREY J. POWER, citizen of the United States, residing at Madison, county of Dane, and State of Wisconsin, have invented new and useful Improvements in Dust-Collectors, of which the following is a specification.

My invention relates to improvements in dust collectors for grinding wheels, buffing wheels, etc.

The object of my invention is to provide means whereby dust and grit from an abrading wheel may be effectually collected and withdrawn without obstructing the working faces of the wheel in a manner to interfere with grinding or buffing operations.

More particularly, the object of my invention is to provide means for overcoming the inertia of particles thrown off by centrifugal force from a grinding or buffing wheel in such a manner as to permit an effectual withdrawal of such particles from all sides of the wheel through a suction nozzle located at one side thereof.

In the drawings—

Figure 1 is a side elevation of an abrading apparatus embodying my invention.

Fig. 2 is a front elevation of the same partly in vertical section.

Like parts are identified by the same reference characters in both views.

In the drawings, A is a grinding wheel and B a buffing wheel mounted upon the respective ends of a shaft C. D, D are suction fans, the rotary members of which are mounted upon a shaft D′ preferably parallel with the shaft C and driven therefrom. The fan is similar to that disclosed in my former patents, Reissue No. 12655, dated May 21, 1907 and No. 1033929, dated July 30, 1912, and therefore need not be specifically described herein. Each fan is provided with a feed-way or suction nozzle E, the mouth E′ of which is located directly underneath the abrading wheel. In the construction illustrated, the right hand suction nozzle E, in Fig. 2, is located with its mouth directly below the grinding wheel A. The left hand suction nozzle has its mouth located directly below the buffing wheel B. The mouths of the suction nozzles are preferably covered by a screen *e*.

The outlet duct F of each fan is tangential as shown and described in my former patents, but in the construction shown, this duct is curved downwardly to pass underneath the fan to a suitable point of discharge and a smaller auxiliary duct G is connected with the main discharge duct F and extends upwardly to a point above the shaft C where it is elbowed at *g* and provided with an extension H substantially parallel with the shaft C and leading to a point above the abrading wheel, where it is again elbowed at *g′* and extended downwardly to form a blast nozzle H′ adapted to deliver air against the periphery of the grinding wheel at the upper side of the latter. A segmental shield I covers the rear portion of the abrading wheel and the blast nozzle H′ extends through this shield. The shield has side flanges I′, whereby the periphery of the grinding wheel is partially inclosed by the shield on the rear side. The blast nozzle H′ delivers air against the grinding wheel within its shield and the shield directs this air downwardly along the periphery of the grinding wheel and also along the sides thereof in the direction of the suction nozzle E.

It will be observed that the auxiliary pipe or duct G is connected with the main discharge duct F substantially at the elbow F′. It will also be observed that the horizontal portion *f* of the outlet duct is somewhat smaller than the downwardly turned portion F. Therefore a considerable portion of the air delivered by the fan will be diverted through the pipe G to the blast nozzle H′ and discharged against the grinding wheel underneath the shield I.

It will also be observed that the auxiliary pipe or duct G and also the fan itself are located in close proximity to the standard J which carries the bars J′ for the shaft C, said auxiliary pipe extending upwardly to a point above shaft C, along a line which is distant from the projecting wheel so that this pipe will not interfere with the work. The elbows allow the pipe sections to be rotated to some extent upon each other and, if desired, one or more of the pipe sections may be made somewhat flexible, whereby the shield I may be adjusted in case the requirements of the work demand the exposure of a greater surface of the grinding wheel or a shifting of the shield either toward or away from the wheel. Ordinarily, however, little, if any, adjustment will be required, for the reason that the entire front portion and

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nearly all of the side portions of the wheel are exposed.

In use, the abrading wheel will ordinarily revolve in the direction indicated by the arrow in Fig. 1. The work will be applied to the front or exposed face of the periphery and the abraded particles will therefore be thrown directly downward into the mouth E′ of the suction nozzle, if immediately discharged from the wheel. But, owing to the rapid movement of the wheel, a considerable number of particles will be carried around to points distant from the points of contact with the work, before leaving the periphery of the abrading wheel. Also the movement of the wheel tends to set the air in motion adjacent thereto and under ordinary conditions a revolving current or film of air is carried around with the wheel and thrown off in all directions by centrifugal force carrying with it particles of dust and grit. I overcome this tendency by means of the blast nozzle H′ which breaks up and neutralizes the force of the air current and also destroys the momentum of the moving particles carried around with the wheel, which would otherwise be thrown off in an upward direction. These particles therefore drop or are carried with the downwardly moving air blast from the nozzle H′ either into the suction nozzle E or to a point where they are brought within the influence of the air currents moving into said nozzle. The momentum imparted to these particles by the abrading wheel having been checked, they are easily carried into the suction nozzle as soon as they are caught by the suction currents.

I do not regard the shield I′ as essential to my invention but it is important for the reason that it distributes the air blast in a film over the entire rear portion of the periphery of the wheel and downwardly along the sides thereof. I therefore prefer to use the shield wherever the nature of the work will permit.

The specific location of the blast nozzle H′ and of the suction nozzle E is also not essential but the suction nozzle E is preferably located below the grinding wheel, for the reason that it is out of the way when in this position and it is also in the best position to directly receive the greater quantity of dust particles thrown off by the grinding wheel under ordinary conditions. The blast nozzle should be located on the opposite side of the abrading wheel from the suction nozzle and particularly, it should be so located as to direct the blast to the upwardly moving side of the wheel. It is not necessary that it should be located diametrically opposite the suction nozzle but it is preferably located a little to the rear of the vertical center line of the abrading wheel.

A valve O, preferably of a damper or butterfly type, is employed to control the delivery of air to the auxiliary duct G, whereby the strength of the blast delivery through the nozzle H′ may be regulated in accordance with the requirements of the work. The valve O is so located that, when open, it swings downwardly into the main outlet duct F and thereby occupies a position where it will deflect the air delivered from the fan into the auxiliary duct. The handle is preferably provided with a latch P adapted to engage the teeth of a segment Q, whereby the damper may be securely held in any desired position of adjustment.

I claim—

1. The combination with an abrading wheel, of a suction nozzle adjacent to the periphery of the wheel on one side thereof, a blast nozzle adjacent to the wheel periphery on the opposite side, means for withdrawing air through the suction nozzle, and means for delivering air through the blast nozzle in the direction of the suction nozzle, whereby the whirling currents of air may be broken up and the particles of dust allowed to drop into the zone of air suction.

2. The combination with an abrading wheel, of a suction nozzle adjacent to the periphery of the wheel on the lower side thereof, and means for delivering a downwardly moving blast of air along the upwardly moving sides and rim portions of the wheel.

3. The combination with an abrading wheel, of a suction nozzle adjacent to the periphery of the wheel on the lower side thereof, and means for destroying the momentum of disengaged particles of matter along the upwardly moving sides and rim portions of the wheel, whereby such particles may be made subject to the influence of gravity and the downwardly moving air currents passing to said suction nozzle.

4. The combination with an abrading wheel, of a suction nozzle having an elongated inlet in proximity to the wheel periphery on one side, means for establishing effective suction through the end portions of said nozzle, means for delivering a blast of air against the abrading wheel at the side thereof which recedes from the nozzle as the wheel is rotated, and an adjustable shield extending around a minor portion of the wheel on the side thereof which receives the blast.

5. The combination with an abrading wheel of a suction nozzle adjacent to the periphery of the wheel on one side thereof, a blast nozzle adjacent to the wheel periphery on the opposite side, a rotary fan having a suction inlet connected with said suction nozzle and provided with a main discharge duct and an auxiliary discharge duct leading from the main discharge duct to the blast nozzle.

6. The combination with an abrading wheel of a suction nozzle adjacent to the

periphery of the wheel on one side thereof, a blast nozzle adjacent to the wheel periphery on the opposite side, a rotary fan having a suction inlet connected with said suction nozzle and provided with a main discharge duct and an auxiliary discharge duct leading from the main discharge duct to the blast nozzle, and a valve adapted to control the delivery of air through the auxiliary duct to the blast nozzle.

In testimony whereof I affix my signature in the presence of two witnesses.

JEFFREY J. POWER.

Witnesses:
LEDROY W. STEVENS,
LEVERETT C. WHEELER.