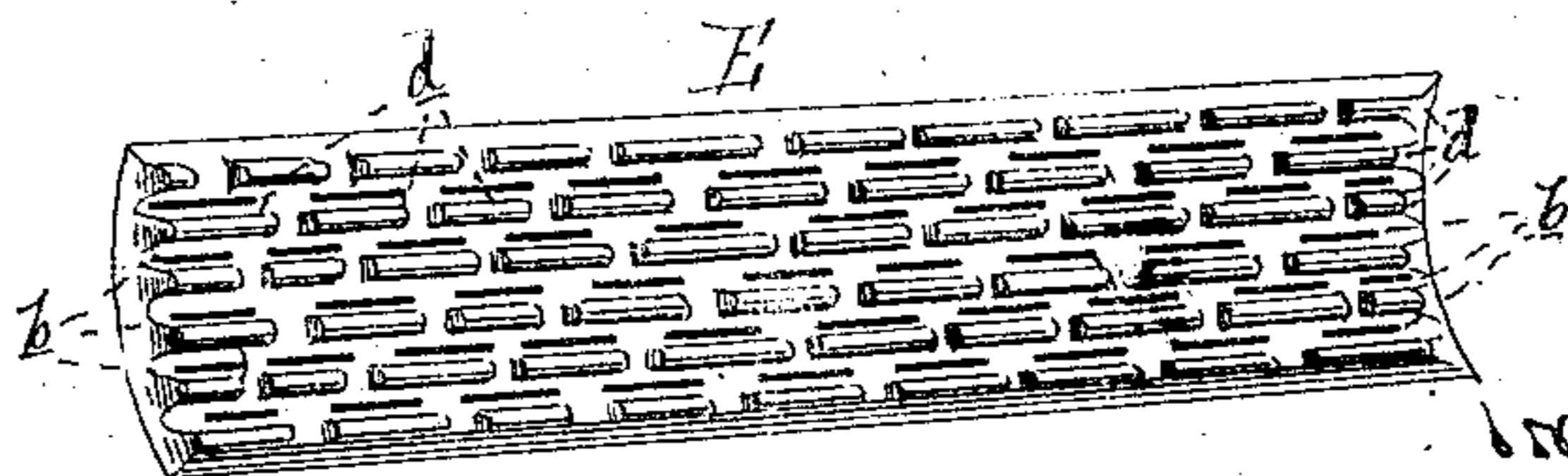
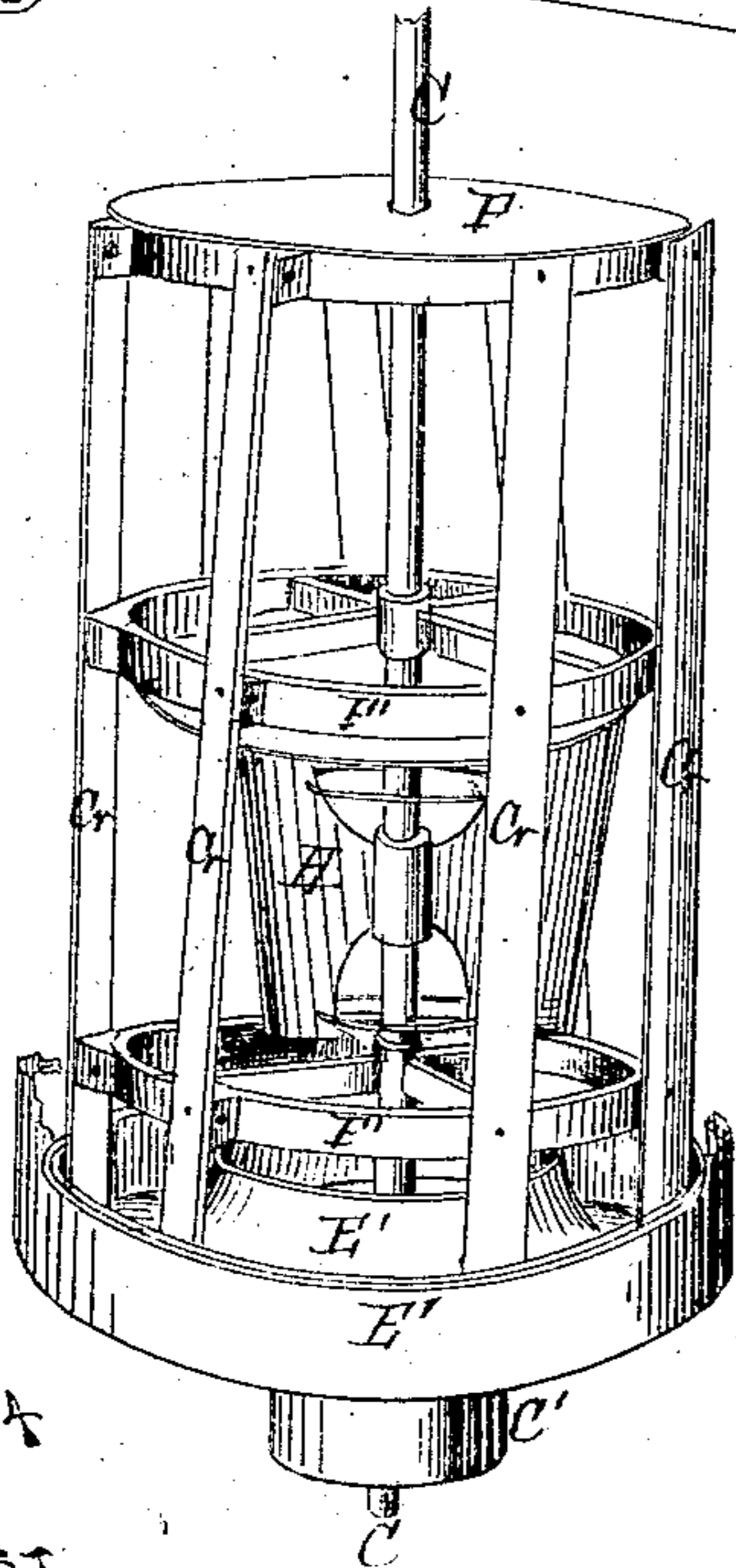
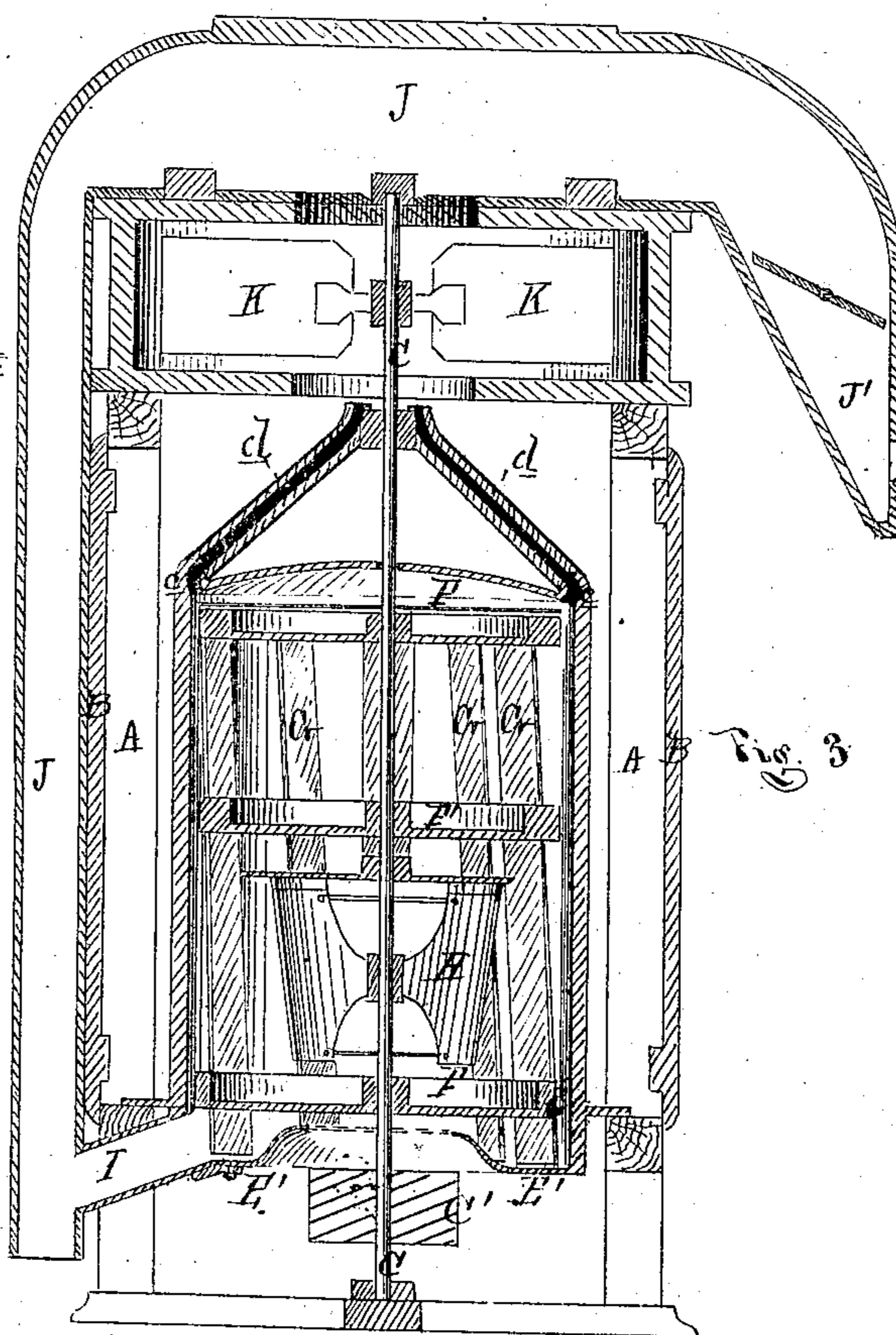
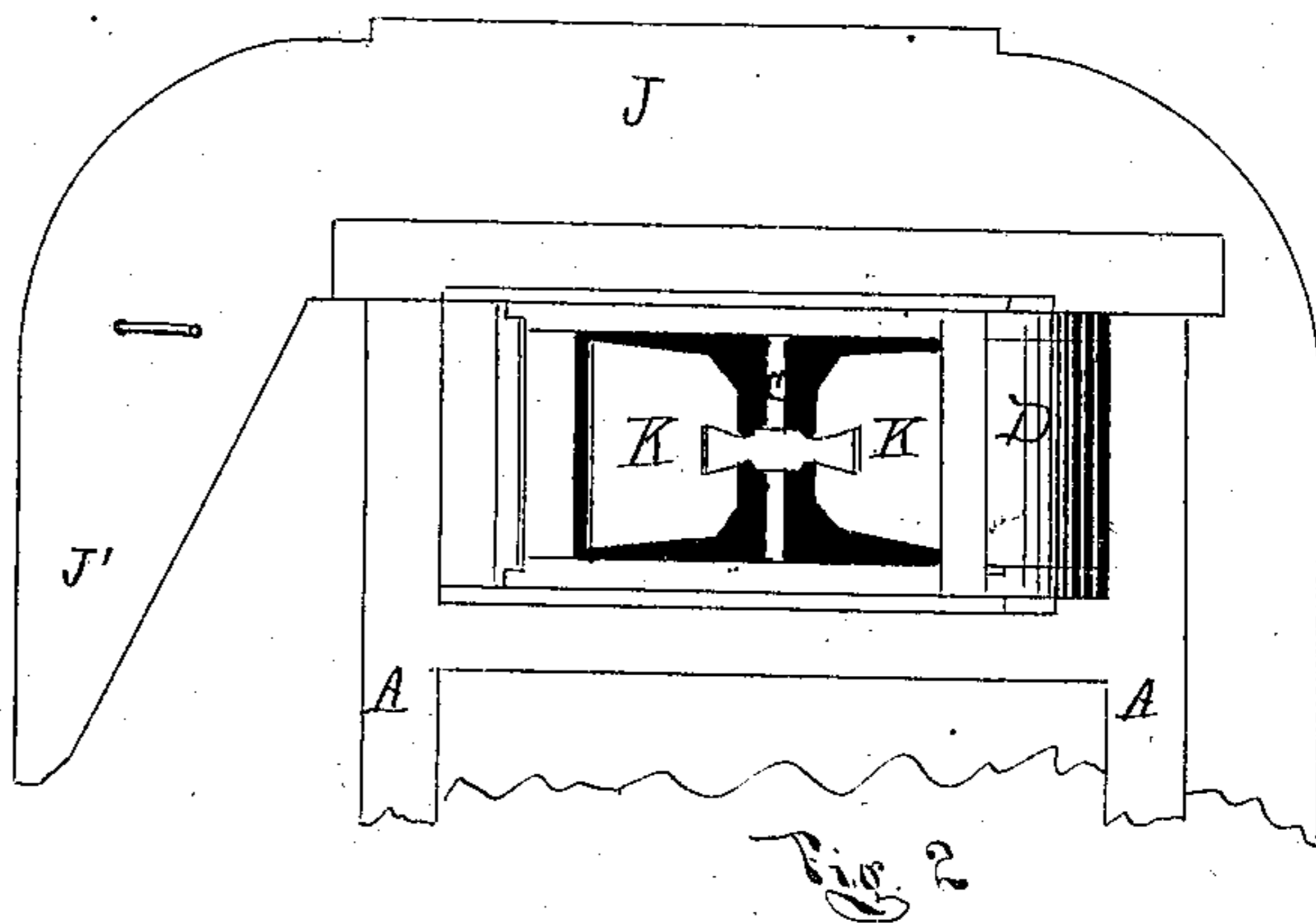
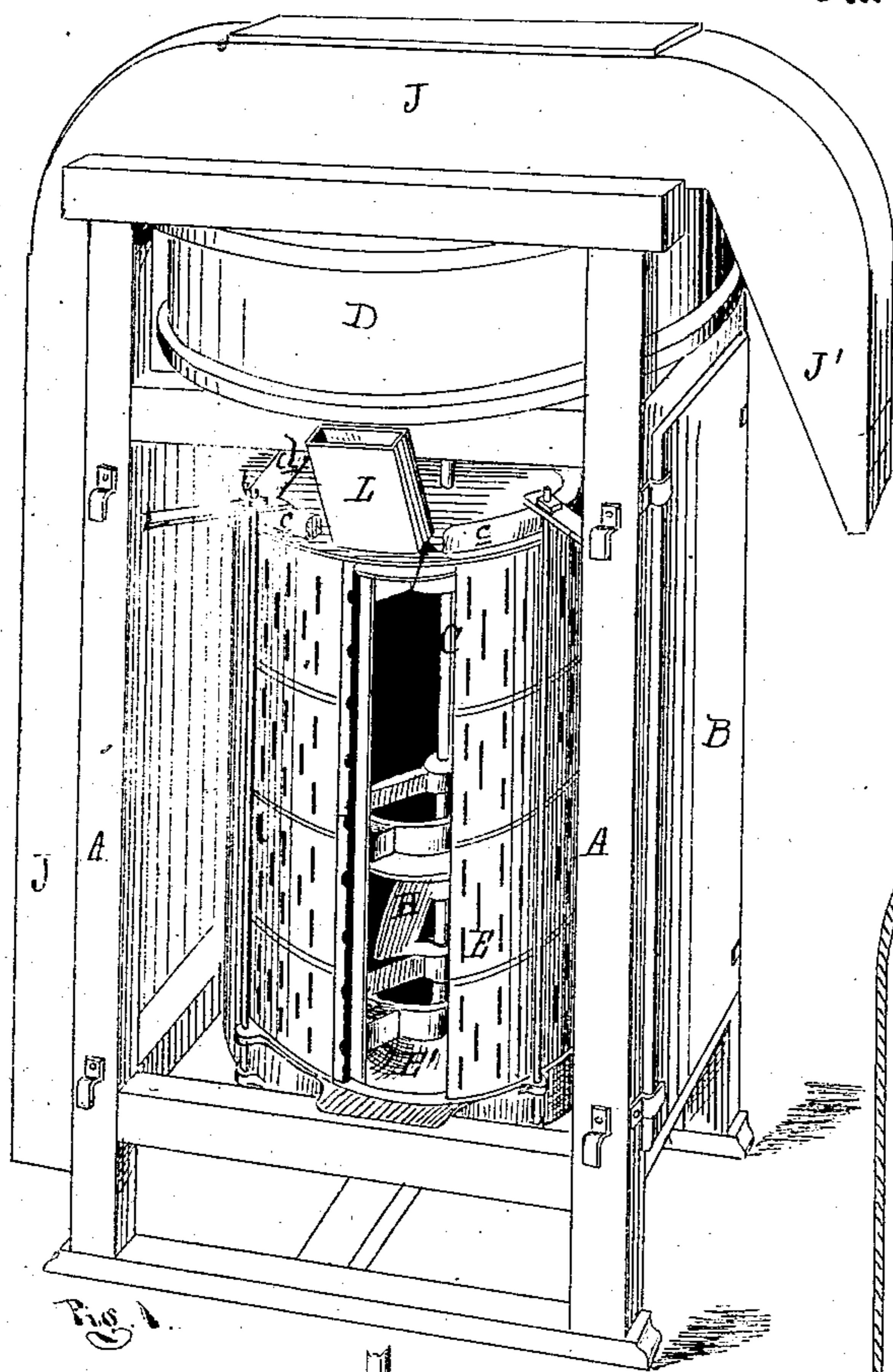


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J. A. BENZING JR.  
SMUT MILL

SMUT MALL

PATENTED DEC 20 1870



ATTEST

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Letters Patent No. 110,191, dated December 20, 1870.

## IMPROVEMENT IN SMUT-MILLS.

The Schedule referred to in these Letters Patent and making part of the same.

### To whom it may concern:

Be it known that I, J. ADAM BENZING, JR., of Oswego, in the county of Oswego and State of New York, have invented a new and useful Improvement in Smut-Mill; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is a perspective view of my device, with one of the staves of the case removed to show the interior arrangement thereof.

Figure 2 is an elevation of the upper fan-case from the discharge side.

Figure 3 is a vertical section of my machine.

Figure 4 is a perspective of the cylinder, beaters, and supplementary fan.

Figure 5 is a perspective of the inner side of one of the casing-staves, showing the peculiar arrangement of the scouring service.

The nature of this invention relates to an improvement in the construction of machines for removing smut from wheat; and

It consists in the peculiar arrangement or conformation of the corrugations on the inner walls of the case, known as the scouring service; in the employment of a supplementary fan in the lower part of the cylinder, so arranged as to throw stray kernels outward to the beaters; in the peculiar arrangement of the beaters with relation to the cylinder and scouring service; and in the arrangement of certain conductors conveying from a channel in the upper periphery of the case into the fan-chamber, whereby the large percentage of smut eliminated from the grain as it strikes the top plate of the cylinder is at once carried away, as more fully hereinafter set forth.

In the drawing—

A represents the rectangular frame of the machine, which is properly inclosed by tightly fitting panels B.

C is a vertical shaft, stepped and journaled in the center of the frame-work, extending up through the fan-case D at the top, and provided with a pulley, C', near its lower end, by means of which it is rotated at a high speed from any convenient source of power.

E is the cylindrical scouring-case, constructed as usual in sections or staves of hard metal, but differing in the internal dress or scouring service, shown in fig. 5 of the accompanying drawing, in which it will be seen that the corrugations *a* do not extend continuously from end to end of the stave, but are broken or interrupted at short intervals. The parallel rows of corrugations are not vertically disposed in the staves, but are slightly inclined or traverse the face diagonally.

*b* are the smut-openings, which, for the reasons

hereinafter given, I am enabled to make much larger on the outside than usual, thereby facilitating the passage of the smut.

F is a disk, and

F' are a pair of spiders secured to the shaft C, forming the cylinder, to which the beaters G are diagonally secured in a contrary direction to the disposition of the corrugations in the scouring service. These six beaters, half the usual number, are tangent to the periphery of the cylinder so as to throw the grain to the case.

H is a small fan secured to the shaft within the lower half of the cylinder, and its blades are so arranged as to draw in a supply of air through the openings in the bottom E' of the case, and direct a blast outwardly against the scouring service, so that any stray grains falling within the beaters may be thrown out to be caught by the beaters, and by them dashed against the corrugations.

The bottom of the case flares from the apex of the opening to the path of the lower ends of the beaters, so that the scoured grain may be carried by them to the spout I leading therefrom to the blast-separator J, open at its lower end, extending up over the top of the machine and terminating in a drop, J', as is usual in all such machines.

Within the fan-case D a fan, K, is mounted on the shaft C, its principal supply of air coming through the perforations of the scouring-case from the inside, thence through the opening in the bottom of the fan-case, as shown in fig. 3. It also receives a limited supply from that part of the blast-separator which lies just above it, as shown in the same figure.

The suction thus created in the separator is sufficient to carry up the light grains which enter it with the sound berries at I, while the heavy ones fall of their own gravity. The impurities are blown out at the side of the fan-case in the usual manner, while the light grains are discharged at the drop J'.

Around the upper periphery of the scouring-case extends a channel, *c*, from which several tubes, *d*, converge and terminate in the lower opening in the fan-case.

L is the spout through which the grain is fed to the machine, impinging, as it enters, on the disk F' of the cylinder, which, in its rapid rotation, breaks up and sets free a large percentage of the smut, which is carried around in the channel *c* to the tubes *d*, whence it is at once sucked up by the fan and discharged without going down with the wheat through the mill, which it relieves to that extent, lessening the number of beaters, and consequently the amount of power required to operate the machine.

The grain now falls over the edge of the disk, when it is caught by the beaters and dashed against the

corrugations, breaking up at the remaining smut-balls, and, from the peculiar arrangement of the corrugations, the wheat cannot fall directly down, but must be turned over many times, thoroughly scouring it before reaching the bottom, whence it is discharged as usual.

The dust of the smut is during this time sucked out through the perforations *b* by the action of the fan, carried up, and blown away.

As before mentioned, the openings *b* flare widely on the outside of the staves, facilitating the passage of the smut-dust through them, preventing its accumulation in the case or obstructing the openings.

I am enabled to make these opening more flaring than usual, from the fact that the grain in passing through the case does not slide in continuous contact with the groove-faces, but is kept constantly turning over by the scouring service; consequently the metal about the openings is not worn away to enlarge them, as is the case with other machines. A scruffy outside portion of the bran, particularly at the blow end of the grain, has always hitherto been very difficult to eliminate. If sufficient velocity were given the cylin-

der to free the grain from it by dashing against the scouring service many of the kernels were liable to be broken and wasted, passing away with the smut.

In this machine the thorough scouring of the grain and elimination of these impurities are effected by the constant overturning of the kernels in contact with the peculiar scouring service, while the impact is not sufficient to do any damage.

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

1. The combination of the case *E* provided with the openings *b*, and corrugations *d* with the fan *H*, shaft *C*, all constructed and arranged substantially as described and shown for the purposes set forth.

2. The combination of the disk *F*, the spiders *F'*, the bottom *E*, the beaters *G*, and the shaft *C*, all constructed and arranged substantially as described and shown, for the purposes set forth.

J. ADAM BENZING, JR.

Witnesses:

PETER SCHILLING,  
ADAM STRICKLING.