

(No Model.)

E. P. CALDWELL.
ROTARY SNOW PLOW.

No. 405,300.

Patented June 18, 1889.

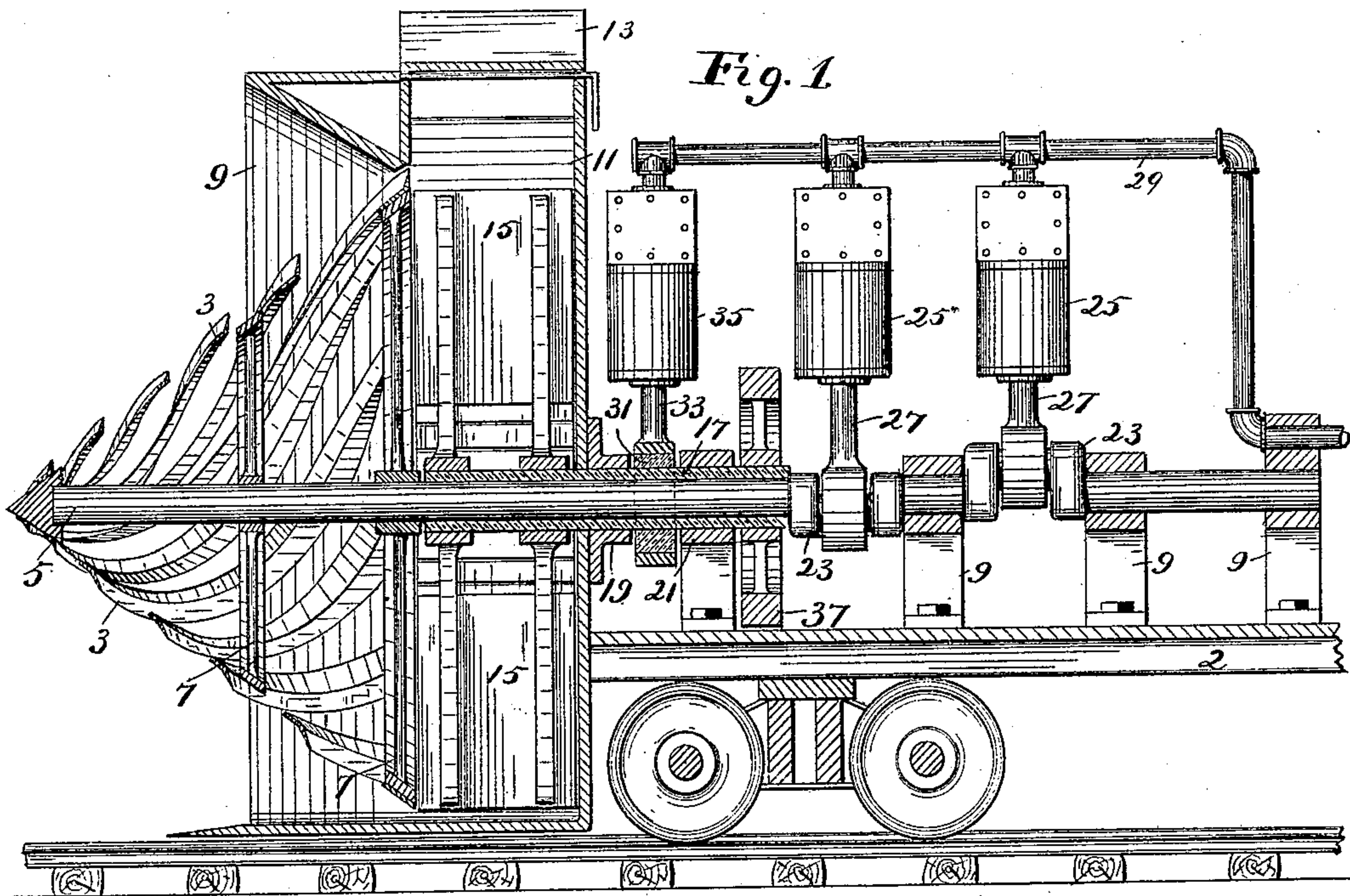


Fig. 1

Fig. 2

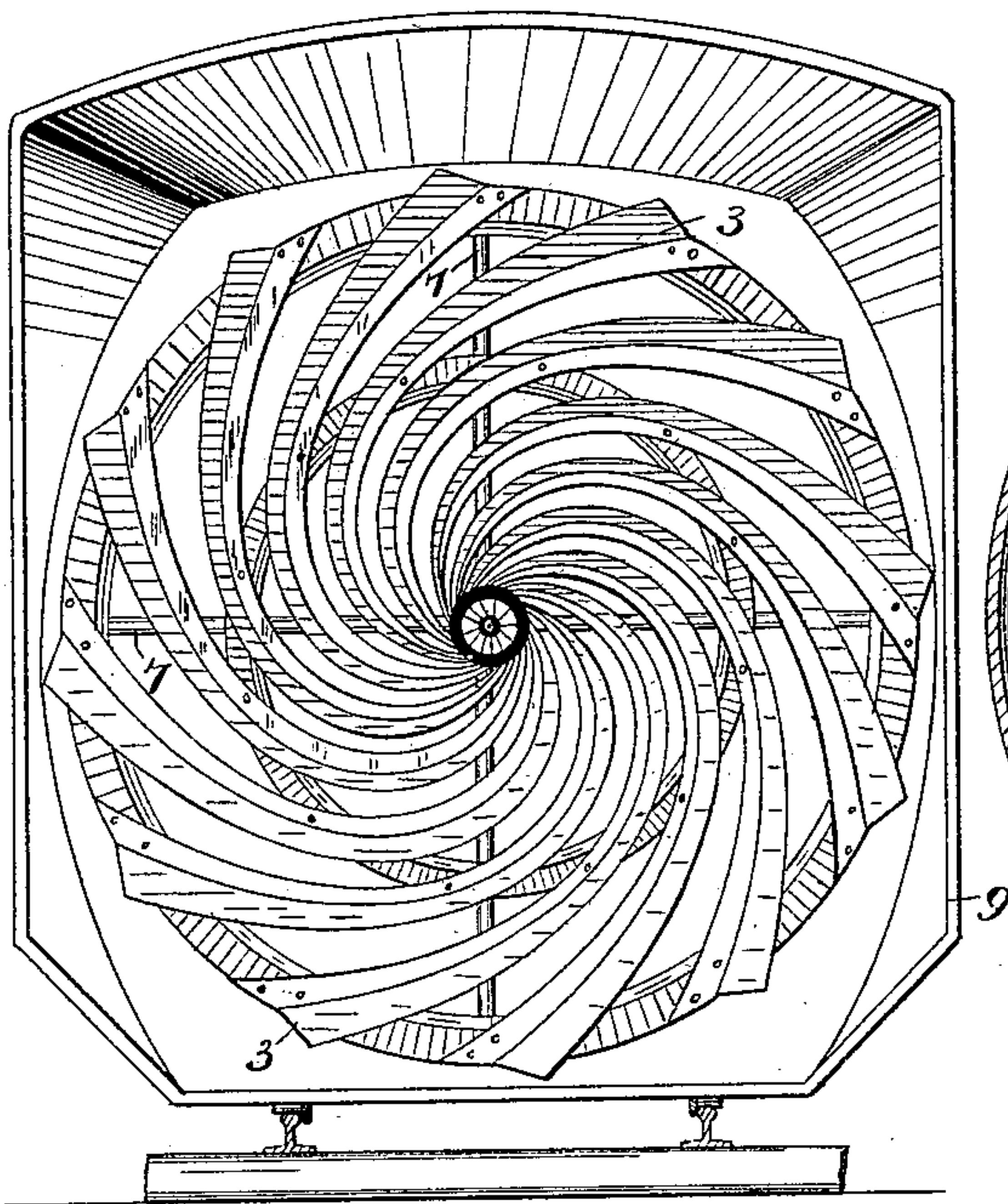
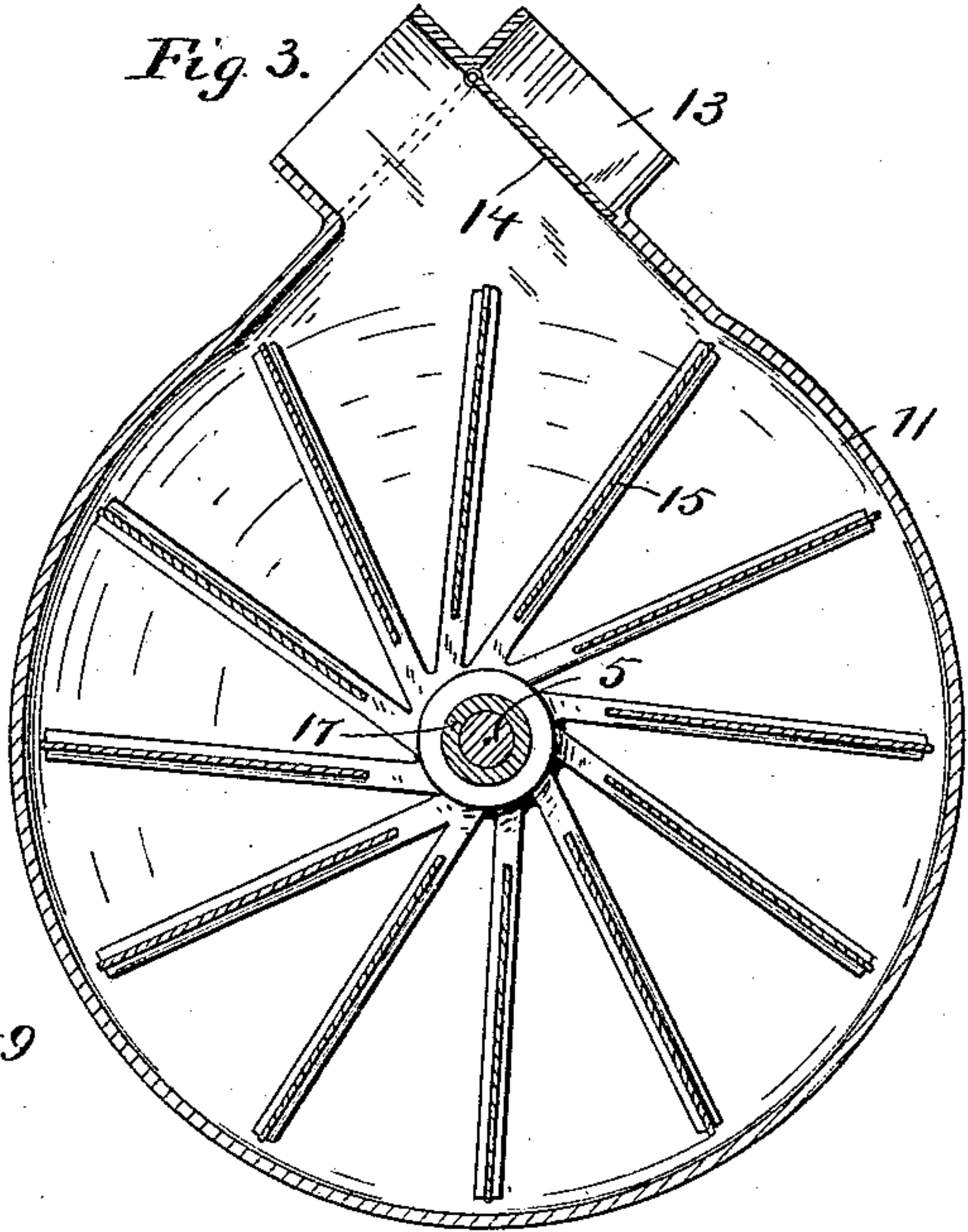


Fig. 3



Witnesses.

J. Jensen.
A. M. Gashill

Inventor.

Edward P. Caldwell

By Paul & Merwin attys

UNITED STATES PATENT OFFICE.

EDWARD P. CALDWELL, OF MINNEAPOLIS, MINNESOTA.

ROTARY SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 405,300, dated June 18, 1889.

Application filed November 19, 1888. Serial No. 291,235. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. CALDWELL, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Rotary Snow-Plows, of which the following is a specification.

The object of my invention is to provide a rotary snow-plow with means for discharging the snow, which will be operated independently of the rotating plow, and will therefore not become clogged, even though the plow itself should be slowed up or stopped entirely by the snow in which it is working.

The invention further consists in certain features in the construction and combination, hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a longitudinal vertical section of a snow-plow constructed in accordance with my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a transverse section through the fan and its casing.

In the drawings, 2 represents a portion of a car upon which the devices constituting the snow-plow are supported.

The plow itself, as here shown, consists of a series of spiral knives 3, arranged in the form of a hollow cone, and secured to suitable shafts 5, by suitable spiders 7. A suitable hood 9 preferably surrounds the cone-shaped plow and aids in directing the snow through the spaces between the knives. The plow itself forms no part of my present invention, having been described and claimed in a prior application for Letters Patent, Serial No. 267,684, filed March 19, 1888. The shaft 5 of the plow is supported in suitable bearings 9, upon the car 2. Arranged in the rear of the conical plow is a fan-casing 11, of suitable construction, and having arranged, preferably at its top, the discharge-spout 13. The front of this casing is open, so that the snow which passes to the interior of the conical plow passes directly into the casing 11. In this casing is arranged a suitable fan 15, which is preferably secured to a hollow shaft 17, surrounding the shaft 5, and being mounted in suitable boxes 19 and 21. The fan 15 and the rotating plow are in-

dependently driven, and any suitable means may be used for this purpose. I have shown what I consider preferable means for this purpose. The shaft 5, as here shown, is provided with cranks 23, arranged at an angle to each other. Steam-cylinders 25 have their piston-rods 27 connected with these cranks.

A pipe 29 may be arranged to provide the cylinders with steam, which may be taken either directly from the boiler of the locomotive or from an independent boiler. The fan-shaft 17 is provided with an eccentric 31, operated by the piston-rod 33 of a steam cylinder 35. The pipe 29 may also be arranged to supply steam to the steam-cylinder 35, as well as to the others. The fan-shaft 17 may be provided with the fly-wheel 37.

It will be seen that with this mechanism the fan may be driven at any desired speed, and that this speed may be maintained independently of the speed of the rotary plow. This is of great importance, as it often occurs in operating rotary snow-plows that the plow will become slowed up in going through heavy drifts, and sometimes will be entirely stopped, in which case the fan, if mounted upon the main shaft of the plow, becomes clogged up, and it is necessary to clear it out before the plow can be operated.

With my device the fan can always be kept at a uniform rate of speed, no matter at what speed the plow may be running, or whether it is running at all. Any snow that reaches the fan will be thrown out of the casing, and the fan may be run at sufficient speed to throw the snow entirely clear of the track. The rapidly-rotating fan will also tend to draw the snow into the fan-casing, and thus aid in keeping the plow clear.

It sometimes occurs that the snow cannot always be discharged at the same side of the track. I prefer, therefore, to construct my machine so that the snow can be discharged at will at either side of the track. For this purpose I prefer to provide a double discharge-spout 13, as shown in Fig. 3, one part extending toward the right and the other toward the left of the machine. A pivoted valve or cut-off 14 is arranged in the spout 13, and is adapted to close either part of the spout. With this arrangement the fan may be rotated

in either direction and the snow discharged from either side of the machine. This is of especial advantage in the use of a rotary snow-plow, and one which could not be secured
 5 except by the use of an independent fan, while the plow itself is preferably always rotated in either direction.

I do not confine myself to the form of rotary snow-plow herein shown, as my improvement
 10 may be applied to other forms of rotary snow-plows.

I claim as my invention—

1. The combination, with a casing having an open front, of a shaft extending through
 15 said casing, a conical cutter secured upon said shaft and having an open rear end in front of said casing, and a rotating fan located in said casing in the rear of said cutter, substantially as described.

20 2. The combination, in a rotary snow-plow, with a casing having an open front, of a conical cutter formed of a series of spirally-arranged knives located in front of said casing, and a revolving fan located in said casing in
 25 the rear of said cutter, substantially as described.

3. The combination, in a rotary snow-plow, with a casing having an open front, of a revolving conical cutter formed of a series of
 30 spirally-arranged knives located in front of said casing, and an independently-revolving fan located in said casing in the rear of said cutter, substantially as described.

4. The combination of the rotating plow, the
 35 shaft 5, upon which said plow is secured, pro-

vided with the cranks 23, the steam-cylinders 25, having the piston-rods 27, connected with said cranks, the hollow shaft 17, surrounding said shaft 5, the fan 15, secured upon said shaft 17 and arranged in the rear of said plow, the
 40 eccentric 31 upon said shaft 17, and the steam-cylinder 35, having the piston-rod 23, engaging said eccentric 31, all substantially as described.

5. The combination, with the independently-rotating plow, of the rotating fan adapted to be driven in either direction, the double
 discharge-spout extending in opposite directions, and the pivoted cut-off arranged in said
 50 spout, substantially as described.

6. The combination, with the rotating plow, of the independently-rotating fan adapted to be driven in either direction, a fan-casing enclosing said fan, discharge-spouts extending
 in opposite directions from said casing, and a
 55 cut-off whereby either of said spouts may be closed, substantially as described.

7. The combination, with the rotating plow provided with the spiral knives, of the independently-rotating fan adapted to be driven
 60 in either direction, the fan-casing provided with the oppositely-extending discharge-spouts, and the cut-off adapted to close either of said spouts, all substantially as described.

In testimony whereof I have hereunto set
 my hand this 12th day of November, 1888.

EDWARD P. CALDWELL.

In presence of—

A. M. GASKILL,

T. D. MERWIN.