

(No Model.)

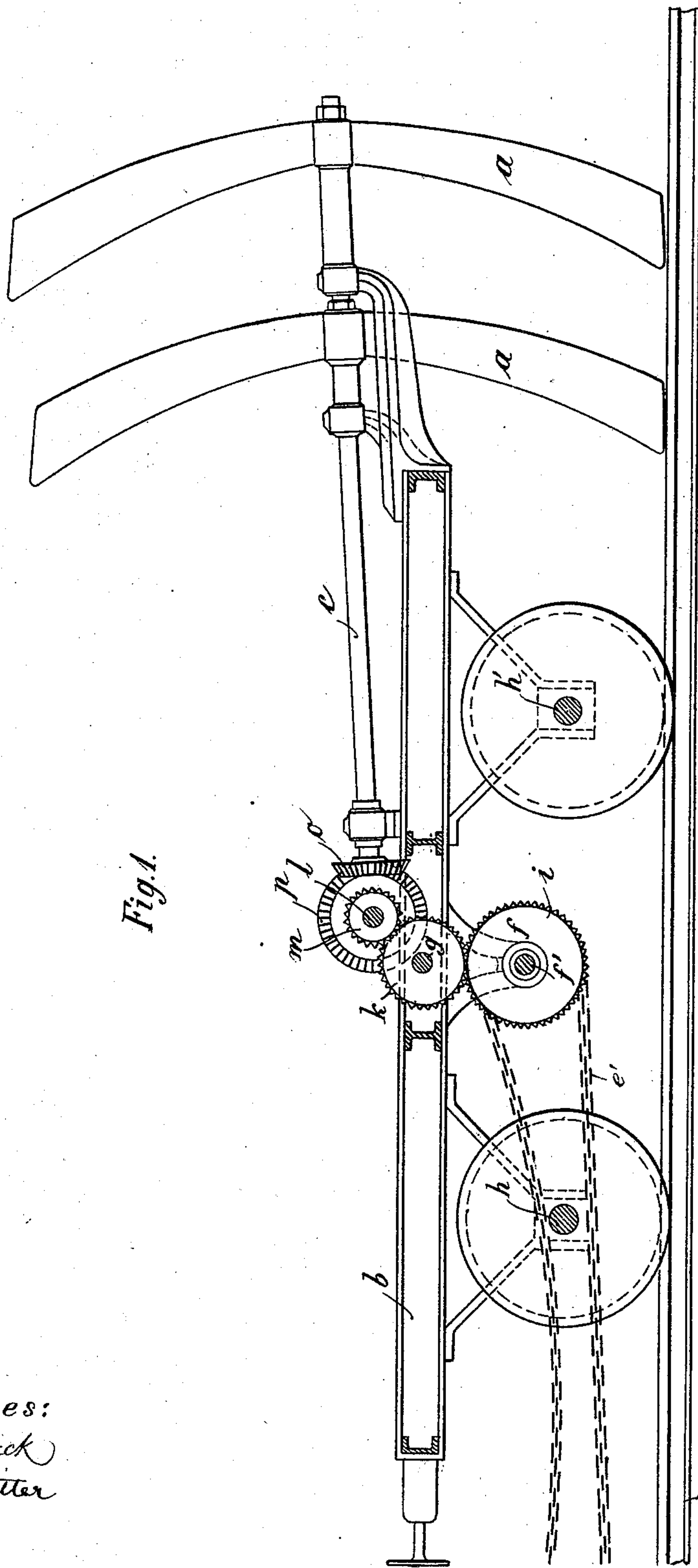
4 Sheets—Sheet 1.

P. GRAEB.

APPARATUS FOR CLEANING SNOW FROM RAILROAD TRACKS.

No. 412,496.

Patented Oct. 8, 1889.



Witnesses:
C. Bedgwick
J. M. Ritter

Inventor:
P. Graeb
By Munn & Co.
Attorneys.

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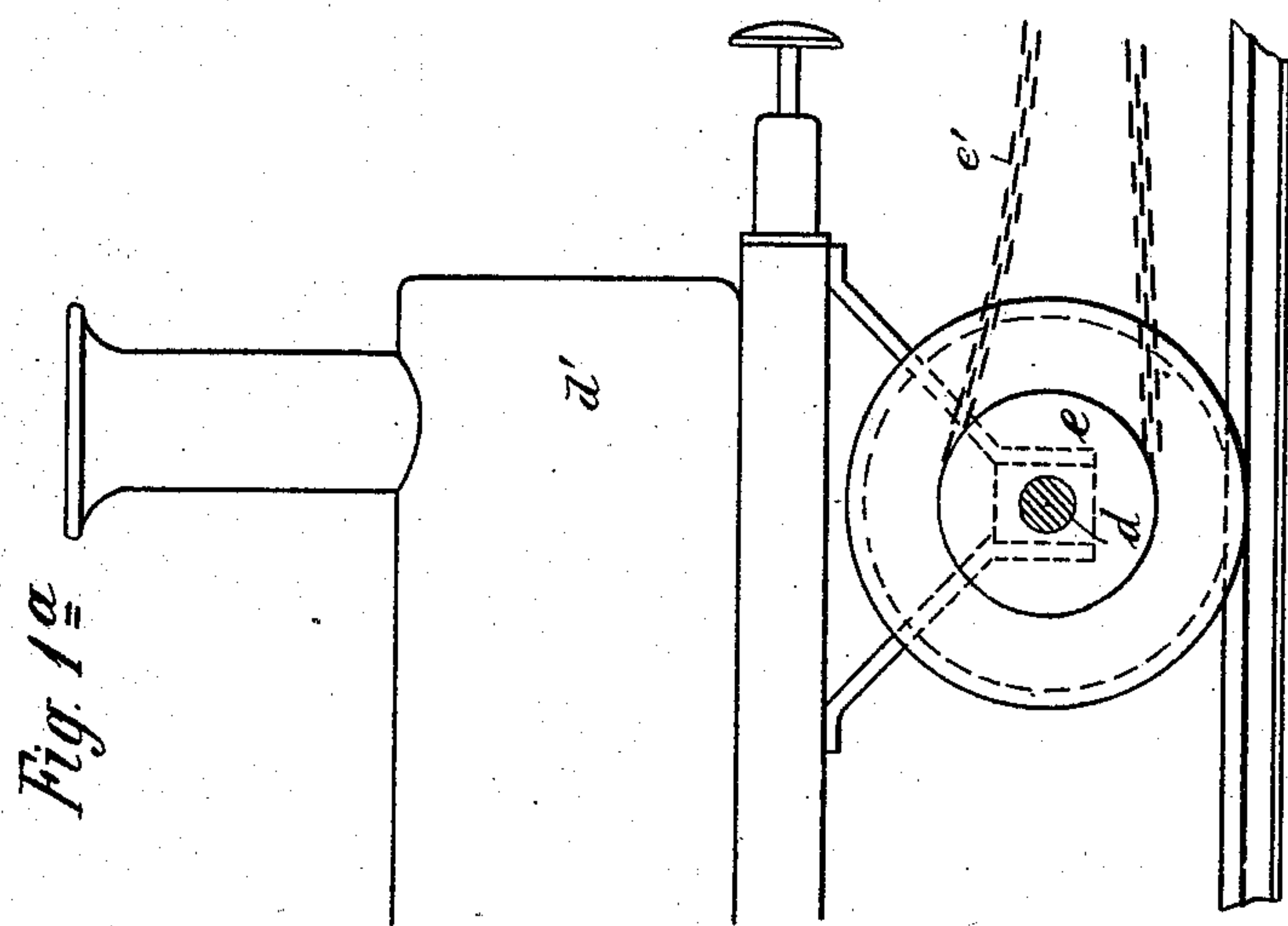
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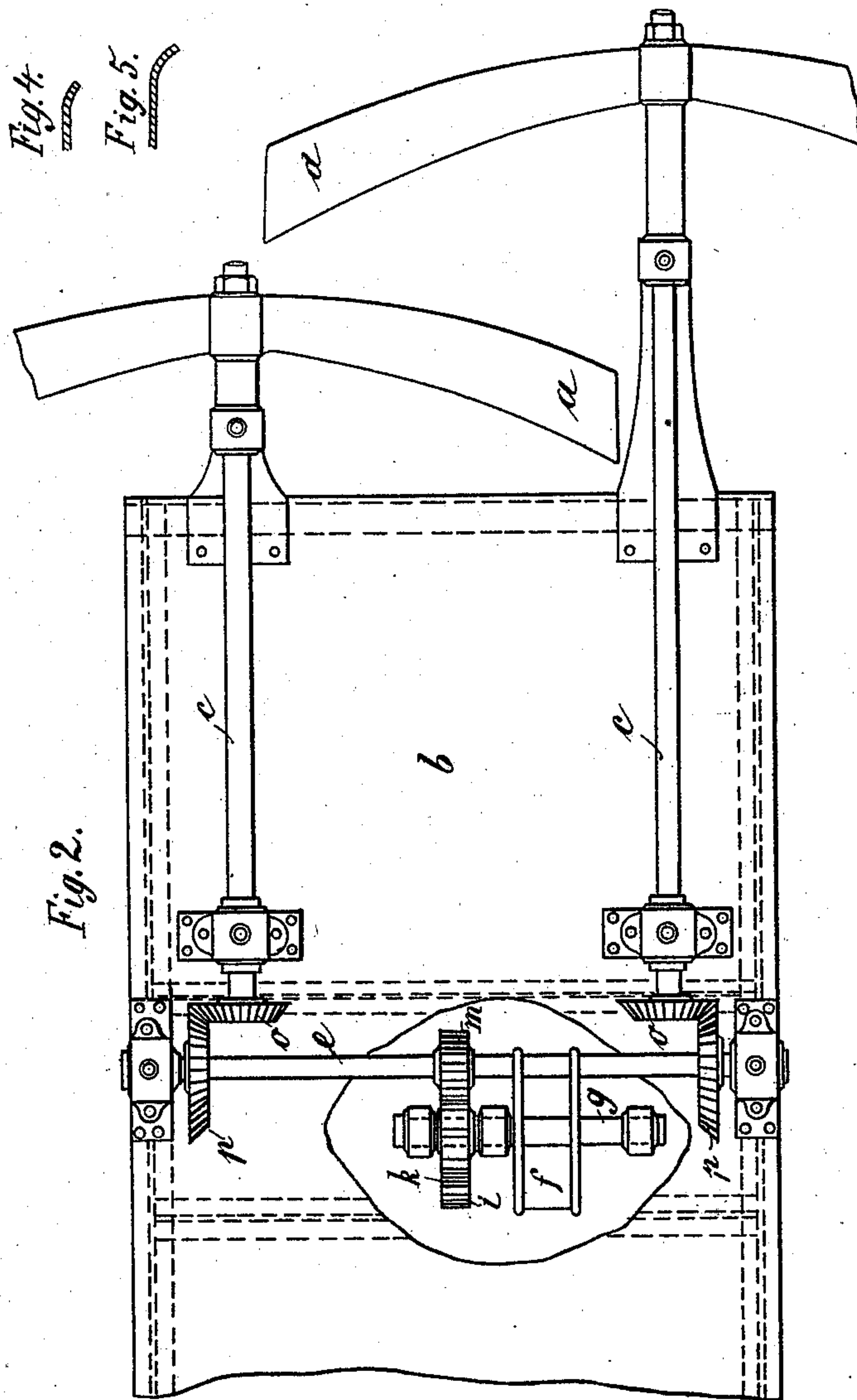
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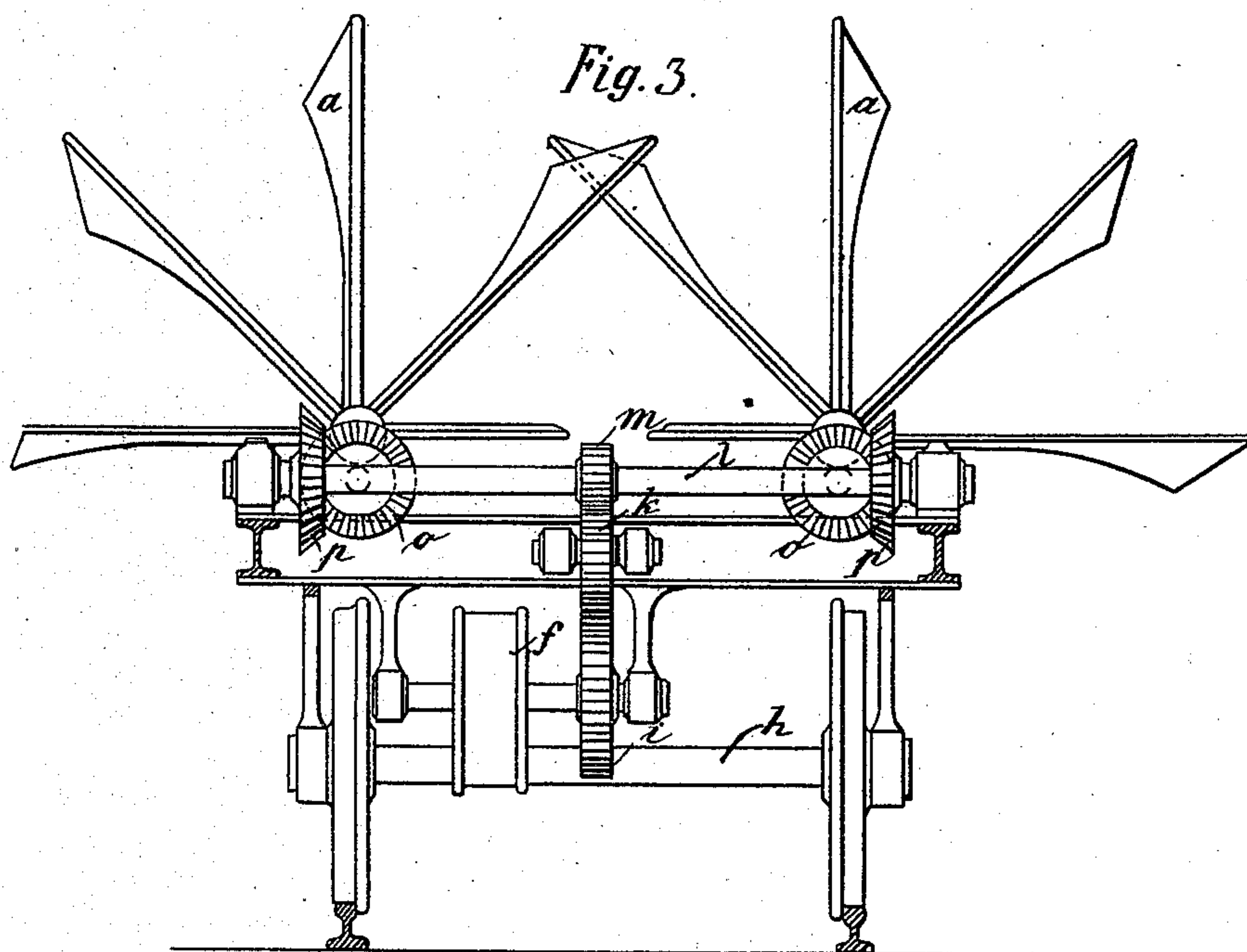
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UNITED STATES PATENT OFFICE.

PAUL GRAEB, OF BERLIN, GERMANY.

APPARATUS FOR CLEANING SNOW FROM RAILROAD-TRACKS.

SPECIFICATION forming part of Letters Patent No. 412,496, dated October 8, 1889.

Application filed April 20, 1889. Serial No. 307,943. (No model.)

To all whom it may concern:

Be it known that I, PAUL GRAEB, professor on the Royal Polytechnicum, of Berlin, in the Kingdom of Prussia and German Empire, have
5 invented a new and useful Railroad Snow-Plow, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to railroad snow-
10 plows, and has for its object to provide an effective snow-plow by means of which the snow will be removed from the center of the track and flung on each side thereof.

The invention consists in a railroad snow-
15 plow constructed and arranged as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate
20 corresponding parts in all the figures.

Figure 1 is a side view in longitudinal section of a pilot-car with a snow-plow constructed in accordance with this invention. Fig. 1^a is a view of the forward part of a locomotive
25 with pulley and chain broken away which connect with the plow. Fig. 2 is a plan view, with parts broken away, of the pilot-car and snow-plow. Fig. 3 is a rear view, partly in transverse section, of the pilot-car and snow-
30 plow. Figs. 4 and 5 represent transverse sections of the blades of the plow, taken through points near the hub and outer extremity, respectively.

Two pairs of helical blades *a* are placed in
35 front of a carriage *b* in such a manner that one pair of helical blades works at the side of and in advance of the other, as indicated in the plan, Fig. 2. The diameters of these pairs of helical blades are from about one to
40 three meters, according to the gage or width of the road or path to be cleared. The pairs of helical blades are also so arranged that the outer ends of the blades sweep over an area corresponding to the profile or configuration
45 of the surface of the road.

The pairs of helical blades *a* are fixed upon shafts *c*, which receive rotary motion from the axle of the front wheels of the locomotive or from one of the axles *h h'* of the carriage *b*. In
50 the former case—that is to say, when the snow-plow is worked by the axle *d* of the front wheels of the locomotive—the following arrangement

is adopted: A chain-wheel *e* is fixed on the axle *d* of the front wheels of the locomotive *d'*, and by means of an endless chain *e'* drives a wheel
55 *f*, keyed on a shaft *f'* on the snow-plow carriage *b*. The endless chain is so arranged as to admit of being readily removed from and replaced on the chain-wheels, and is of a suitable weight to enable it to drive the wheels
60 without slipping, even when the buffers between the plow and the locomotive are pushed as far as they can go. The shaft *f'* is also so arranged that the rear axle *h* of the wheels of the plow-carriage does not come in the way
65 of the chain. A toothed wheel *i* is keyed on the shaft *f'* and drives an intermediate wheel *k*, which transmits motion through a wheel *m* and shaft *l* to bevel-gear *p o* and to the shafts
70 *c*, carrying the pairs of helical blades *a*. This driving-gear is so arranged as to obtain an accelerated motion, so that the pairs of helical blades revolve rapidly and cast the snow onto the banks on either side of the road.

There may be any suitable number of heli-
75 cal blades which are so arranged that the part near the center of rotation projects forward into the face of the drift or mass of snow, so that the central part of the blades engages with the snow before the other part and gradu-
80 ally works the snow away to the outer ends. The front edges of the blades are also curved, so that they cut into the snow like shovels and pare it off. The lower or outer ends of the blades are likewise curved like shovels to
85 enable them to carry up and fling away the snow on the side banks, Figs. 4 and 5. By these means the helical blades are enabled to act in a similar manner to shovels in their rotary movement. The rapid rotation of the
90 blades, which is regulated by the rate at which the plow advances, causes the snow to be quickly caught up and thrown off at the sides.

When the pairs of helical blades are driven by the axle of the plow-carriage, one of the
95 axles of the carriage *b* is provided with a chain-wheel of the same or similar form to the wheel *e* on the axle of the front wheels of the locomotive, and which, by means of an
100 endless chain, drives the chain-wheel *f*, or, according to another arrangement, the chain and chain-wheels *e f* are dispensed with and the movement is transmitted direct from the axle *h* or *h'* to the gearing *i k m*.

By suitably modifying the details of construction the plow may be employed for clearing away snow from streets, roads, or other places.

5 What I claim, and desire to secure by Letters Patent of the United States, is—

1. A snow-plow consisting of a carriage having mounted thereon rotary shafts of different lengths and projecting forward from
10 the carriage, helical blades mounted on the projecting ends of the rotary shaft, the blades on one shaft being in advance of and at one side of the blades on the other shaft, and a driving mechanism connected with the rotary
15 shafts, substantially as shown and described.

2. A snow-plow consisting of the carriage *b*, the rotary shafts *c*, of different lengths, projecting forward from the carriage and mounted thereon, the pairs of helical blades *a* on the outer ends of shafts *c*, one pair of blades being in advance and at one side of the other, a gearing on the carriage *b*, connected with shafts *c*, and a pulley *f*, substantially as shown and described. 20

In witness whereof I have hereunto set my hand in presence of two witnesses. 25

PAUL GRAEB.

Witnesses:

GEORGE H. MURPHY,
PAUL FISCHER.