

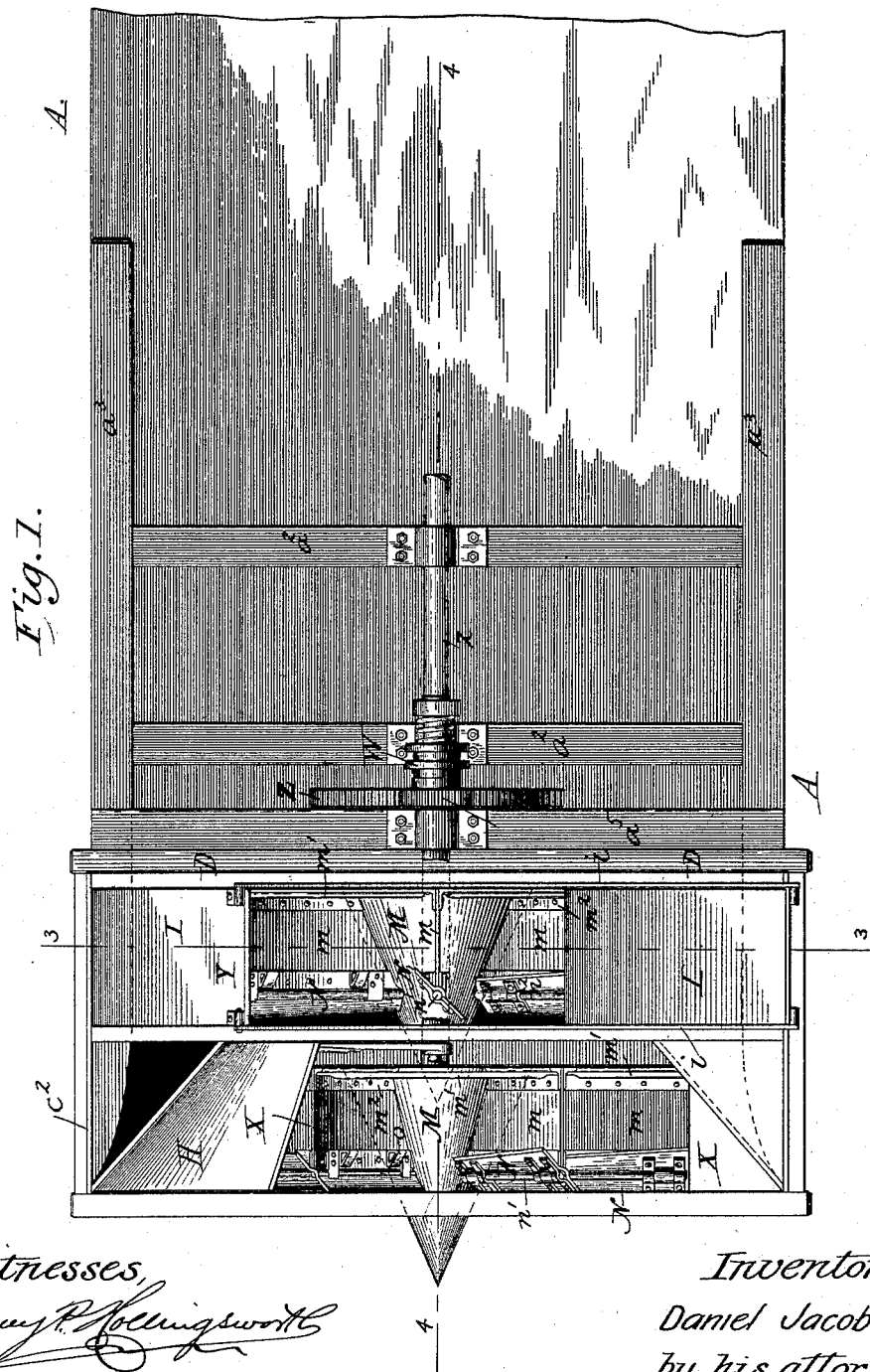
(No Model.)

3 Sheets—Sheet 1.

D. JACOBS.
SNOW PLOW.

No. 489,008.

Patented Jan. 3, 1893.



Witnesses,
Sidney P. Hollingsworth
Joseph C. Stack.

Inventor,
Daniel Jacobs
by his attorneys
Baldwin, Davidson & Light.

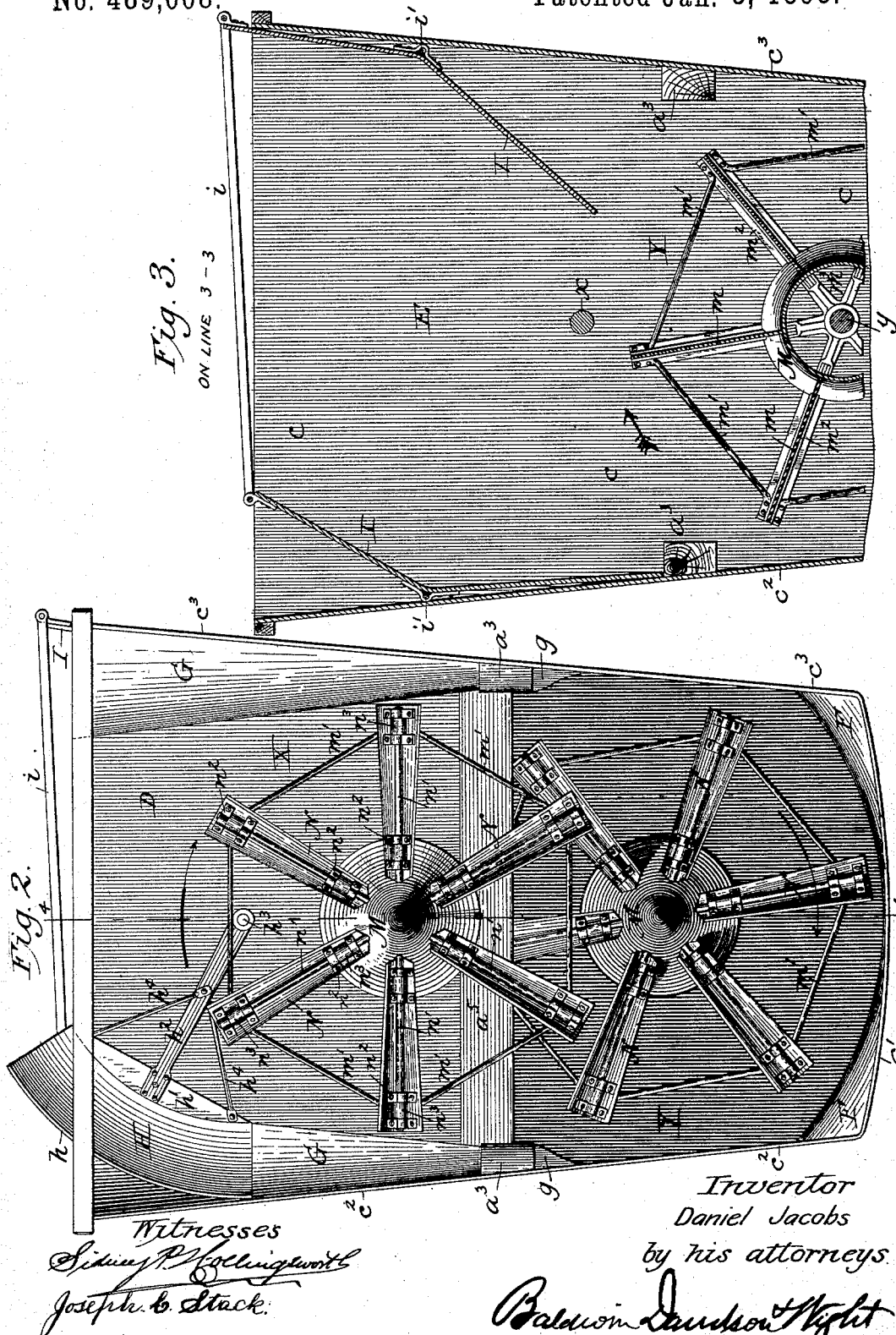
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3 Sheets—Sheet 2.

D. JACOBS.
SNOW PLOW.

No. 489,008.

Patented Jan. 3, 1893.



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Inventor
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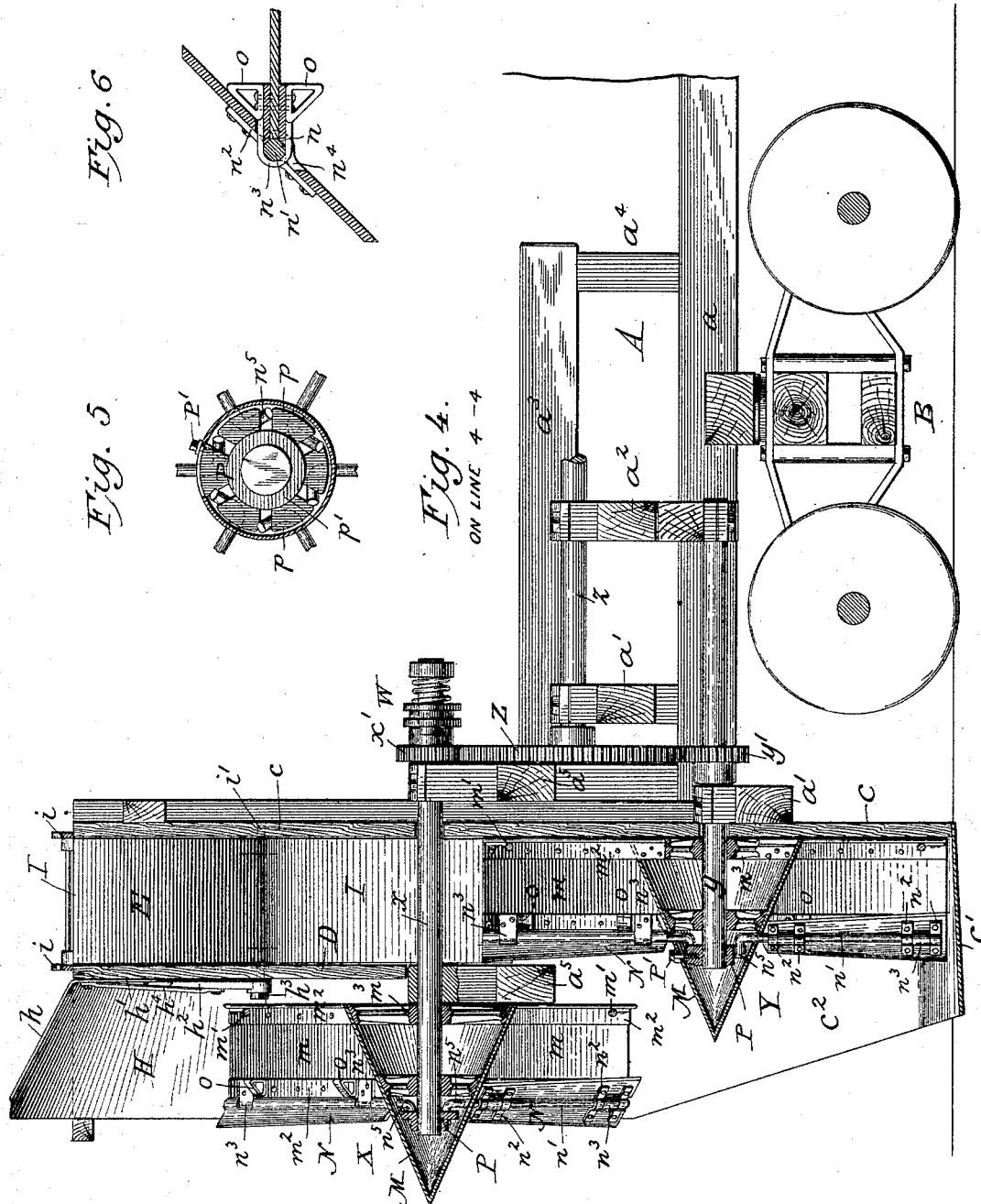
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

DANIEL JACOBS, OF GRIGSBY, KANSAS.

SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 489,008, dated January 3, 1893.

Application filed February 25, 1892. Serial No. 422,753. (No model.)

To all whom it may concern:

Be it known that I, DANIEL JACOBS, a citizen of the United States, residing at Grigsby, in the county of Scott and State of Kansas, have invented certain new and useful Improvements in Snow-Plows, of which the following is a specification.

My invention relates to that class of snow plows or excavators which are especially designed for removing large masses of snow from railway tracks.

The object of my invention is to increase the strength, durability and efficiency of excavators of this kind.

In carrying out my invention I employ two fan wheels, each carrying a series of knives or cutters adapted to rotate with the wheels and to cut from a snow bank masses of snow which are caught by the fan wheels and hurled from the track with a strong current of air through chutes beneath which the fan wheels are arranged.

My invention involves certain improvements in the general organization of the plow or excavator and in its details of construction which will be hereinafter fully described.

In the accompanying drawings Figure 1 is a plan view of my improved excavator. Fig. 2—is a front elevation. Fig. 3—is a vertical transverse section on the line 3, 3, of Fig. 1. Fig. 4—is a vertical longitudinal section on the line 4, 4, of Figs. 1, and 2. Fig. 5—is a detail view on an enlarged scale of the devices for holding the knives in their adjusted positions and Fig. 6—is a detail view on an enlarged scale of one of the knives showing particularly how it is secured to the fan blade.

The main frame or body A is supported on a truck B of any suitable construction adapted to travel on the track in front of a locomotive in the usual way. As shown the body is constructed as follows: The sill beams a are connected by cross beams a' a^2 and side beams a^3 are supported by standards a^4 a short distance above the sills a . Cross beams a^5 connect the side beams near their front ends.

I employ two fan wheels X and Y mounted on shafts x and y respectively and said shafts by means of pinions x' and y' are connected to a large gear wheel Z carried by a shaft z , which may be rotated by an engine mounted on the truck body, or in other suitable way.

The shaft y is mounted in bearings on the beam a' , and the shaft x is mounted in bearings carried by the cross beams a^5 . As it is sometimes desirable to drive the lower wheel Y without driving the upper front wheel X. I provide means for making and breaking the connection between the shafts x and z , this may be done as shown by means of a clutch W of well known construction for connecting and disconnecting the pinion x' with the shaft x . The fan wheels are mounted in an upright casing at the front end of the truck. The rear end of the casing is closed by a solid back wall c and the bottom c' and sides c^2 , c^3 , are preferably formed of sheet metal the front and the top remaining open. The bottom c' is curved and is arranged close to the track; the sides c^2 , c^3 , are inclined from their lower ends upwardly and outwardly sidewise and their edges are inclined, as shown in Fig. 4, from their lower ends upwardly and forwardly. A partition D is arranged over the shaft x . It extends from one side piece to the other being connected therewith about midway between their front and rear ends. A chute E is thus formed over the fan wheel Y through which snow is carried by the blast generated by said wheel.

The snow "handled" by the fan X is delivered upwardly through the open top of the casing between the sides c^2 , c^3 , and in front of the partition D. Inclined guides F are formed in each corner of the bottom of the casing to prevent the snow from being packed there, and similar guides G for a similar purpose are arranged in the corners of the casing above the beams a^3 . Small inclined guides g , are arranged immediately below the beams. In order to direct the course of the snow after it leaves the fan wheels and to prevent down drafts,—I employ deflectors in front and rear of the partition D.

The deflector H in front of the partition is shown as consisting of a curved inclined plate h , having a straight back piece h' to which is secured an arm h^2 , pivoted at h^3 , to the partition midway between the sides c^2 , c^3 . Braces h^4 secured to the back piece h' , near its ends and to the arm h^2 , intermediate its ends serve to make the connection between the deflector-plate and the arm firm, strong and rigid. The deflector is free to be moved on the pivot h^3 ,

as a center and may be shifted from one side of the casing to the other to be in proper working position corresponding to the direction of rotation of the wheel X. The deflector I in rear of the partition in the chute E, is somewhat differently constructed. It is made in two parts connected by rods i . Both parts are of the same shape, size and construction. Each is preferably formed of a sheet metal plate the width of which is nearly equal to the distance between the partition D and the back wall c. The plates extend from the top of the chute downwardly to near the top of the wheel Y and they are pivoted at i' at the opposite sides of the chute. The plates are bent at their pivots, those portions below the pivots being shown as slightly longer than those above though this is not important. As shown in Fig. 3—the plate at the left side has its lower portion about parallel with the side wall of the chute, the upper portion being inclined upwardly and inwardly while the plate on the opposite side has the upper portion parallel with the side of the chute and the lower portion is inclined downwardly and inwardly. When the deflectors are arranged as shown in Fig. 3—and the fan wheel rotating as indicated by the arrow the snow is carried by the current of air upwardly, outwardly and to the right as shown in the drawings, the deflectors guiding the current and preventing down drafts. When the wheel is rotated in the opposite direction the deflectors are reversed and operate in a similar way.

The fan wheels X and Y are similar in construction, but the lower one Y is preferably of a slightly greater diameter. I will describe the wheel X, it being understood that as far as the construction is concerned, the description applies equally to the wheel Y. A series of fan blades m (six being shown) radiate from the shaft and are tied together and strengthened at their outer ends by rods m' . Angle irons m^2 , are secured to the front and rear edges of the blades to give them strength and rigidity. The blades at their inner ends are secured to a spider or hub m^3 to which is also fitted a conical shield M which extends in between the blades and also projects outwardly in front of the shaft. By this means I prevent the snow from packing in the angles between the blades, cover the joints at the front of the shaft and shield the knife adjusting mechanism as will be hereinafter explained. To the front edge of each fan blade is attached a knife N. The length of the knife is about equal to the length of the blade and it is centrally pivoted thereto. As shown in Fig. 6—the knife has a vertical central recess n to receive the pivot rod which is held in the recess by straps n^2 . Straps n^3 , secured to the edges of the blades extend through slots n^4 in the knives and attach their pivot rods to the fan wheel. The arrangement is such that the knives may be adjusted on their pivots to cut in either of two directions

according to the direction of rotation of the wheel. Each blade is provided on opposite sides with inclined brackets o against which the knives rest when at work and by which they are held at the proper inclination for cutting effectively. In order that the knives may all be adjusted simultaneously and held in place when adjusted I prolong the pivot rods n' , toward the shaft and give them right angle bends n^5 which extend between the arms p of a shifter P. The hub p' of which is mounted on the shaft and is free to turn thereon. The hub may be turned in either direction and clamped to the shaft by a set screw P', and thus the knives may be simultaneously set and locked in proper position. The screw P' extends through a slot, as shown in Fig. 5, and by moving the screw back and forth in the slot and clamping it to the shaft, the knives may be set at the desired inclination. As before stated the wheel Y, is the same in construction as the wheel X. It is a little larger than X, and is arranged below and in rear thereof.

In operation the plow, as it is moved forward, cuts its way through the snow bank, masses of snow are severed by the revolving knives and these masses are caught by the fans and hurled up and out, away from the track.

I claim as my invention,—

1. The combination, substantially as hereinbefore set forth, of the front casing having a partition between its sides, a lower rear fan wheel carrying knives and arranged below a chute in rear of the partition, an upper front fan wheel carrying knives and arranged in advance of the partition and between the sides of the casing, and means for revolving both knife-carrying fan wheels.

2. The combination, substantially as hereinbefore set forth, of a casing closed at rear and at both sides and bottom and open at front and top, inclined guides F and G, for the corners of the casing, a partition extending from one side piece to the other, a knife-carrying fan wheel arranged in front of the partition, and a knife-carrying fan wheel arranged in rear of and below the partition.

3. The combination, substantially as hereinbefore set forth, with the lower rear knife-carrying fan wheel, of the deflectors in a chute above the fan wheel, each consisting of a blade pivoted at the sides of the chute bent at its pivot, extending in opposite directions therefrom and having a rod connecting their upper ends, whereby they may be simultaneously operated.

4. The combination, substantially as hereinbefore set forth, with a fan wheel, having radial blades of the pivoted knives, the brackets on opposite sides of each blade against which the knives rest, and means for adjusting the knives.

5. A fan wheel having its blades strengthened with angle iron and tied together by rods as described, in combination with knives

pivoted to the front edges of the blades, brackets against which the blades rest, and the shifter mounted on the shaft of the fan wheel.

5 6. The combination, substantially as here-
inbefore set forth, of the fan wheel, the knives,
the pivot rods for the knives, means for at-
taching the knives to the blades, a hub car-
rying arms between which the lower bent

ends of the pivot rods are arranged, and 10
means for adjusting the hub on the shaft.

In testimony whereof I have hereunto sub-
scribed my name.

DANIEL JACOBS.

Witnesses:

LLOYD B. WIGHT,

SIDNEY P. HOLLINGSWORTH.