

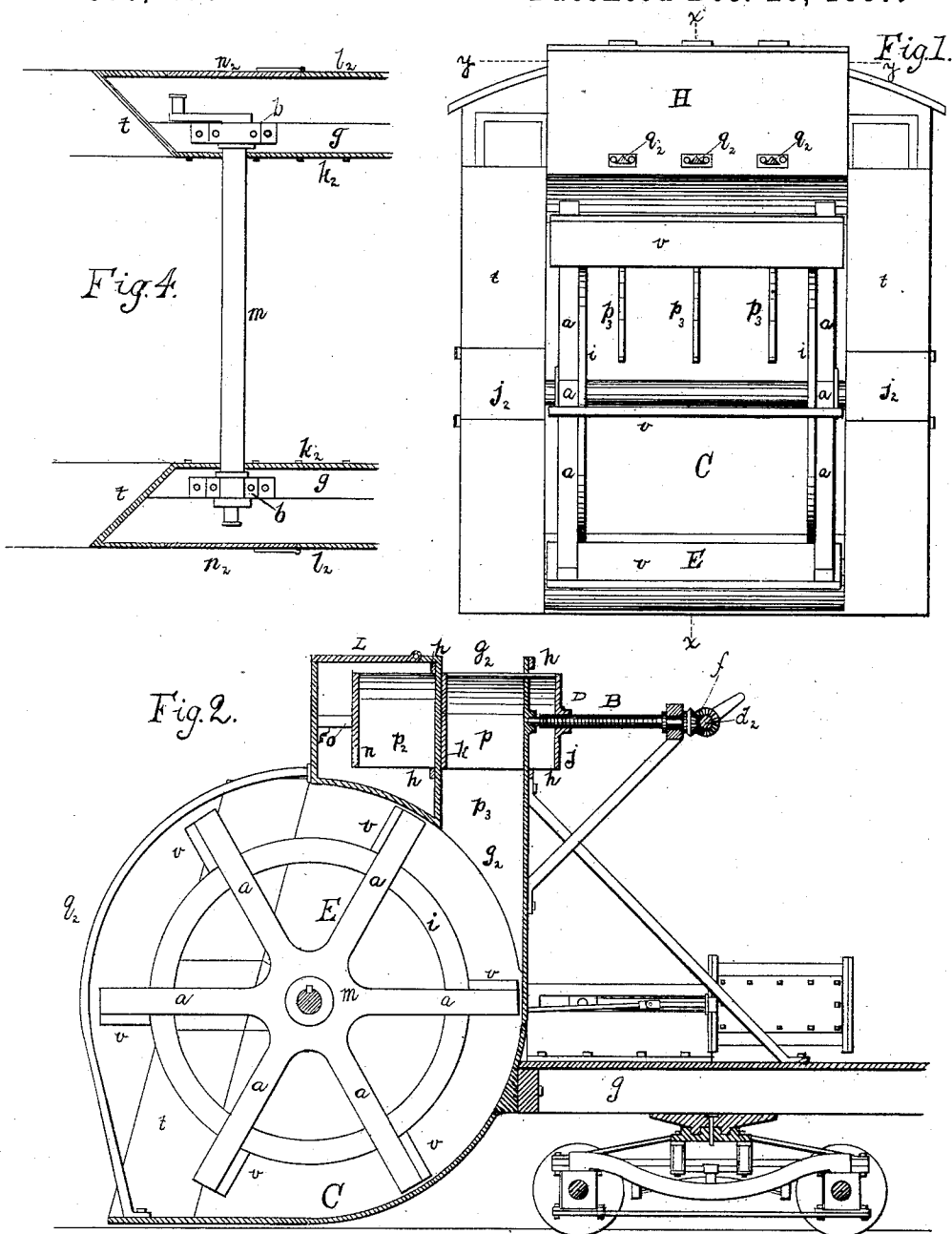
(No Model.)

2 Sheets—Sheet 1.

G. COX.
EXCAVATOR.

No. 375,132.

Patented Dec. 20, 1887.



WITNESSES:

Alexander Landordale Shaw
William Augustus Chapman Matthews

INVENTOR

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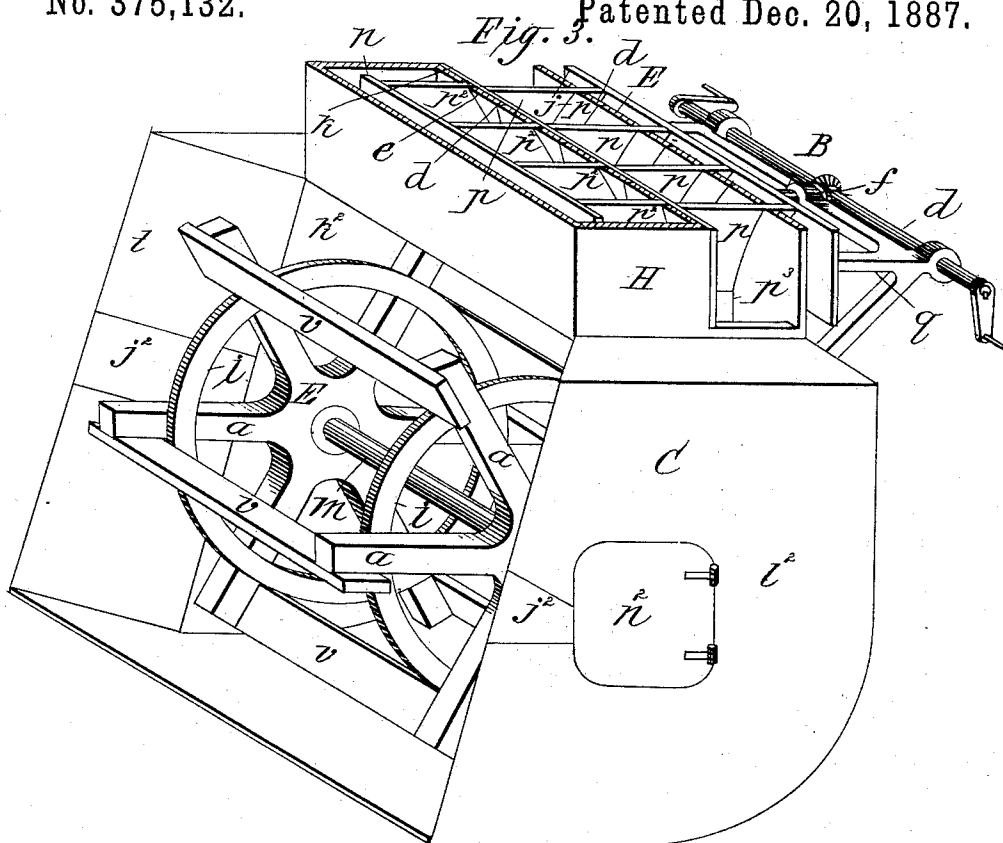
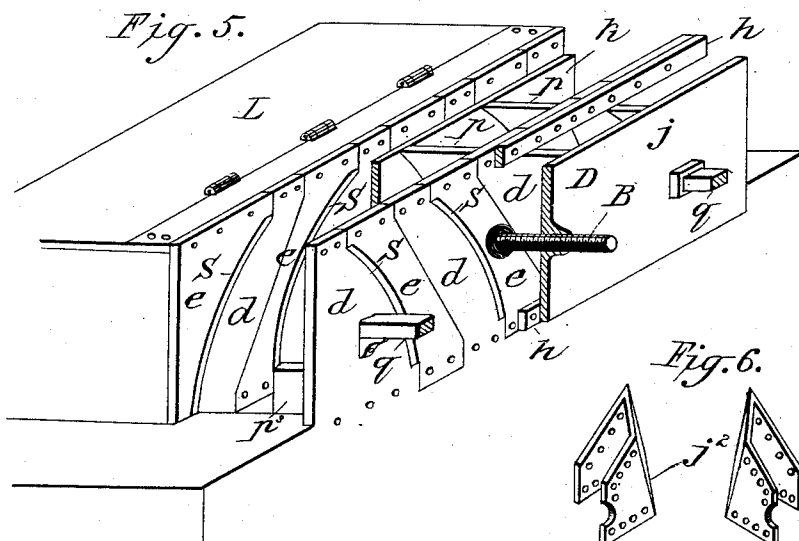
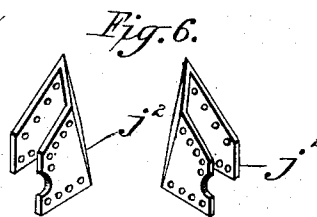
(No Model.)

2 Sheets—Sheet 2.

G. COX.
EXCAVATOR.

No. 375,132.

Patented Dec. 20, 1887.



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE COX, OF PATERSON, NEW JERSEY.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 375,132, dated December 20, 1887.

Application filed February 16, 1886. Serial No. 192,130. (No model.)

To all whom it may concern:

Be it known that I, GEORGE COX, a subject of the Queen of Great Britain, and residing at the city of Paterson, in the county of Passaic and State of New Jersey, have invented a certain new and useful excavator or machine for excavating and removing snow from railway-tracks, street-railways, streets, sidewalks, and other surfaces, and for the excavation and removal of sand, loose earth, and other materials, and for other similar purposes, of which the following is a full, clear, and exact description.

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

Figure 1 is a front elevation of a car provided with my excavator. Fig. 2 is a vertical section on the line X X, Fig. 1. Fig. 3 is a perspective view of the apparatus sectioned on the line Y Y, Fig. 1. Fig. 4 is a horizontal section in the plane of the shaft of part of the casing. Fig. 5 is a perspective view, partly in section, of the discharge-spout of the apparatus and of the means of regulating the delivery of the snow. Fig. 6 represents parts of the casing in perspective.

My invention relates to an excavator or machine for the purpose above mentioned, consisting of a revolving fan wheel or beater mounted upon a horizontal shaft and provided with a suitable casing, so that when the fan is revolved and the apparatus as a whole is moved forward in a horizontal direction perpendicular to the line of the shaft the snow or other material will be engaged by the vanes of the fan-wheel and retained by the casing in contact with the vanes of the fan-wheel until it is discharged in a vertical direction through one or more suitable openings in the casing.

My invention further relates to a set of inclined or curved plates placed in or over said opening or openings in the casing, and so arranged that when the snow or other material strikes against said inclined plates it will be deflected and take a component of motion parallel to the shaft and be delivered to one side of the machine.

My invention still further relates to providing two sets of plates inclining or curving in opposite directions, instead of one set of in-

clined plates, as before stated, and so arranged that either set of inclined plates may be brought over or in the discharge opening or spout of the casing, so that the snow or other material may be delivered to either side of the apparatus.

To enable others skilled in the art to which it pertains to make and use my invention, I will proceed to describe its construction and operation.

The apparatus is mounted on a car, as shown in Figs. 1 and 2. Upon the forward end of a car, as represented in Figs. 1 and 2, is secured a casing, C, approximately a segment of a hollow cylinder and provided with double ends $k^2 k^2$ and $l^2 l^2$. The flaring parts $t t$ unite the double ends k^2 and l^2 , and are adapted to make an opening through the snow or other material wide enough for the car to pass.

Upon suitable girders, $g g$, extending from the front of the car, or upon other means of support and in suitable bearings, $b b$, is a horizontal shaft, m , which passes through the center of the hypothetical cylinder, of which casing C is a segment, and to which is keyed or otherwise secured fan-wheel E. This wheel consists of a set of fans or vanes, $v v$, &c., attached to radial arms $a a$. The arms $a a$ are connected by bands or rings $i i$, which thus serve to connect and strengthen these parts and brace the wheel.

In order to admit of the insertion of shaft m in bearings $b b$, I provide the parts $j^2 j^2$ of casing C, made separable from the rest of the casing. I also provide doors $n^2 n^2$ in the outer ends of casing C, to admit of access to bearings $b b$ and to the mechanism conveying motion to shaft m . I also employ guard-bars $q^2 q^2$, suitably spaced so as to prevent solid obstructions on the track or other surface from entering the machine.

Casing C is provided with a vertical opening or spout, g^2 , the length of the wheel and of a suitable width, into which the snow or other material is delivered from the wheel E. I prefer to divide this spout by a number of vertical partitions, $p^3 p^3$, &c. I also extend the front and rear walls of this vertical spout above the level of the rest of the casing by sections or serrations $d d$, to which are secured plates $e e$ by means of strips $h h$, so as to form slots $s s$. Above $p^3 p^3$ are a series of inclined

or curved plates, p , passing through slots s in the rear wall of spout g , and another series of plates, p^2 , which incline or curve in an opposite direction, and which pass through slots s in the front wall of spout g .

The plates p and p^2 are connected together by plates j , k , and n , which thus serve to carry and brace these parts. The plates j and n are provided with suitable bearings, so that the entire system of plates j , k , n , p , and p^2 can be moved backward and forward on slides o and q , so as to bring either set of deflecting-plates p or p^2 in spout g^2 . In order to move the deflecting-plates either backward or forward, I employ a screw, B , mounted in suitable bearings and so arranged as to mesh into the threads of female screw D in plate j , and connected by intermeshing bevel gear-wheels f to crank-shaft a^2 .

All that part of the casing C in front of spout g^2 and the front wall of spout g^2 may be removed without seriously impairing the action of the machine; but I prefer to retain them and construct on said part of casing C the box H to receive plates p^2 when not in use, and to furnish protection from the snow or other material to slide-bars o . In order to admit of access to slide-bars o , I provide box H with a hinged cover or lid, L .

I propose to carry on the car a steam boiler and two steam-engines coupled to cranks keyed or otherwise secured to the ends of shaft m ; but I do not confine myself to the above or to any other particular motor, nor is there anything special in the arrangement of mechanism by which I propose that motion shall be communicated to the parts described as embodying my invention.

The machine operates as follows: When the fan-wheel is put in rapid rotation and the machine, as a whole, is moved forward by means of a locomotive coupled to the rear of the car, or by other means of propulsion, the snow or other material is engaged by vanes v , and is carried around inside the casing until it is delivered by centrifugal force into spout g^2 . The snow or other material passing through

spout g^2 comes in contact with deflecting-plates p and takes a component of motion parallel to shaft m , so that it will be delivered to one side of the machine. When it is desired to deliver the snow or other material to the other side of the machine, the screw B is put in rotation, which causes plates p to take a position back of spout g and the plates p^2 to enter spout g , so that the snow or other material may be deflected to the other side of the machine.

In place of using a screw, bevel-wheels, and crank-shaft for transmitting motion to the plates p and p^2 , any suitable form of gearing may be employed.

When it is not necessary to change the delivery of the snow or other material from one side of the machine to the other, only one set of deflecting-plates will be used and they will be permanently secured in spout g .

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an excavator, a revolving fan-wheel partially inclosed by a casing, in combination with a vertical spout provided with and containing a set of inclined or curved plates, substantially as described.

2. In an excavator, a revolving fan-wheel partially inclosed by a casing provided with an opening or spout, in combination with two sets of plates inclining or curving in opposite directions and so adapted that either set of inclined plates may be brought in or over said spout or opening, substantially as shown and described.

3. In an excavator, a casing, C , provided with double ends connected by flaring parts t , substantially as shown and described.

4. The combination of sections d , plates e , and strips h , substantially as and for the purpose specified.

5. The combination of plates p , p^2 , j , k , and n , and guides o and q , substantially as described, and for the purpose specified.

GEORGE COX.

Witnesses:

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WILLIAM AGUSTUS CHAPMAN MATTHIE.