(No Model.)

C. HOWARD.

EXCAVATOR.

No. 333,949. Patented Jan. 5, 1886.

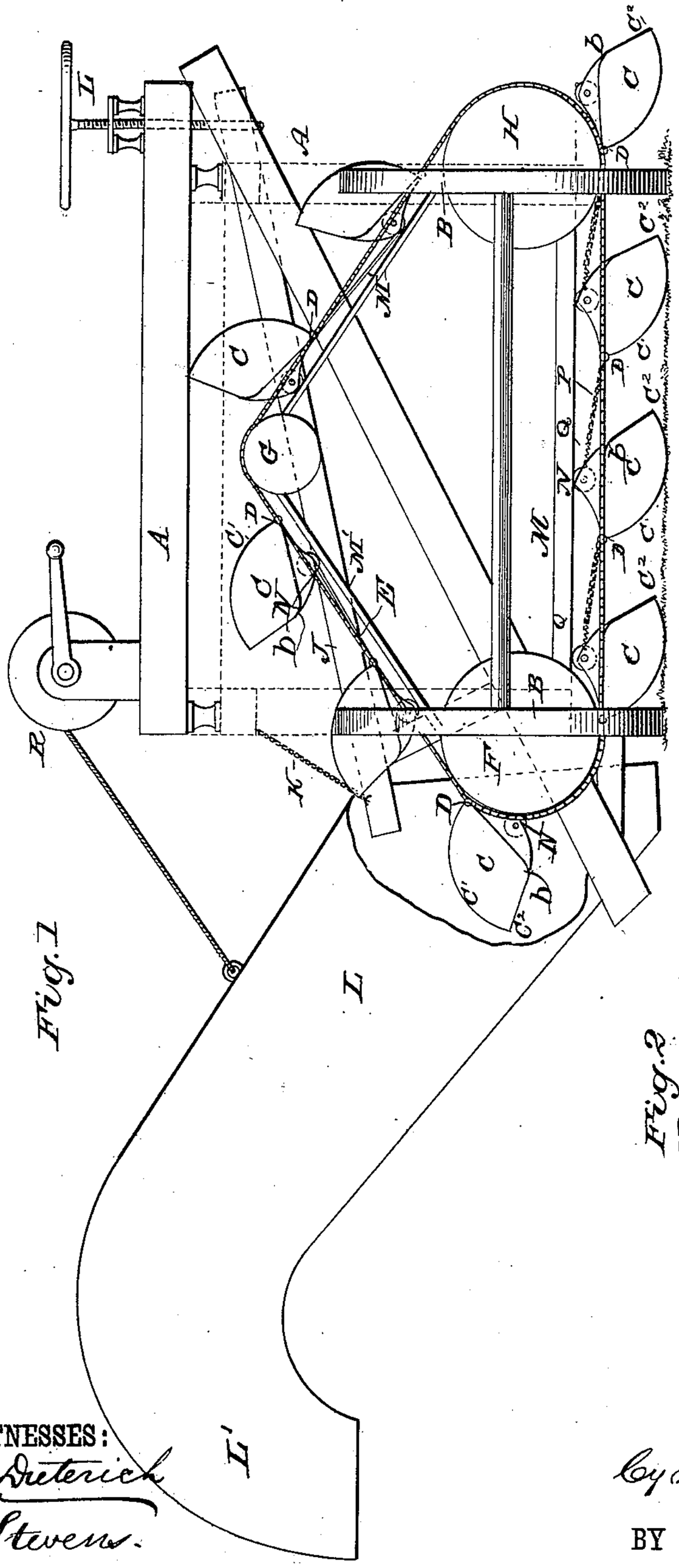

Fig. 1.

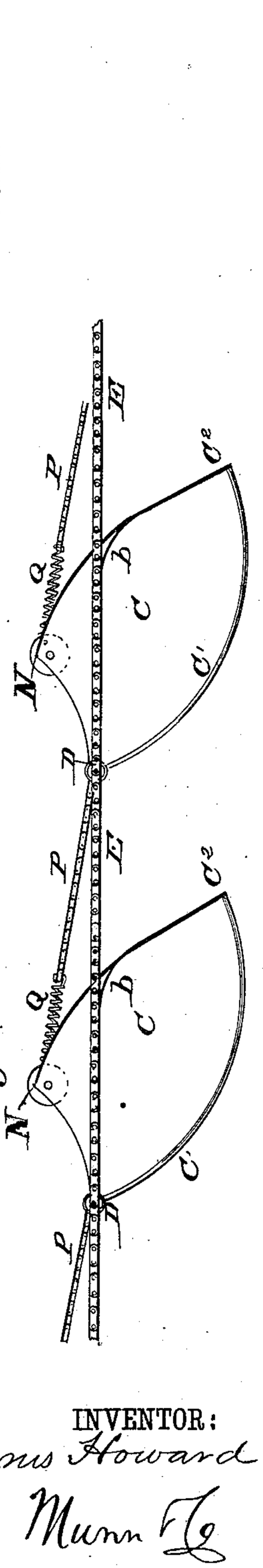

Fig. 2.

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UNITED STATES PATENT OFFICE.

CYRUS HOWARD, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO WILLIAM WALLACE PATRICK, OF SAME PLACE.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 333,949, dated January 5, 1886.

Application filed May 12, 1885. Serial No. 165,280. (No model.)

To all whom it may concern:

Be it known that I, CYRUS HOWARD, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Excavators, of which the following is a description.

This invention relates to that class of excavators which are principally used for leveling earth, for digging trenches, and such like work where the machine takes up the earth and moves it to one side, dumping it onto the ground there or delivering it into an attendant wagon, the same being an improvement on my Patent No. 306,755; and the object of the invention is to shear off slices of earth as a plowshare does, to move the earth from the path of the machine to one side thereof, and to throw it to a distance therefrom.

To this end my invention consists in the construction and combination of parts forming portions of an excavator hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional front elevation of my excavator, and Fig. 2 is an enlarged side elevation of two scoops and adjacent parts.

A represents the frame of the machine mounted on wheels B.

C represents a series of scoops attached at their upper back edges, D, to two side chains, E, which are mounted to revolve on three or more wheels, F G H, across the ditch or path of the machine. In this specification the scoops are described relatively to their own characteristics conforming to the characteristics of the common grocer's scoop, and not relatively to their direction of travel. The back of the scoop extends from the top corner, D, to the lower corner, *b*. The bottom extends from C^2 to *b*. The side edges, C′, extend from D to C^2, the latter being the front edge of the scoop, which is dragged back foremost in service. The wheels F G H may be revolved by any usual means, a steam-engine mounted on the excavator being preferred. The wheels F G H are journaled in a frame, J, which is hung to the main frame by means of bails or chains K, and elevating-screws L, by which the frame may be canted to either side.

M represents a rail, against which the rear sides of the scoops drag when their front edges, C^2, meet resistance. M′ represents two similar rails, on which the scoops drag when empty. Rollers or shoes may be interposed at N, if necessary, to avoid friction. A characteristic of this scoop, as here used is that while gathering its load its bottom slants rearward, so as to drag its edge and the loose dirt before it along on the ground rather than to push its edge forward under the dirt and carry the dirt within it on its bottom, as scrapers usually do To loosen the earth ahead of the dragging bottom, I shape the sides C′ with sharp curved edges to act like plowshares. The curved portion of these edges runs as low or lower than the scraping edge C^2, and the whole length of the edge C′ inclines to the rear of the scoop-pivots D. By this means I avoid hooking the scoops under roots, large stones, &c., which are likely to break the machine; and I carry the scoop-bottom in a suitable position from which to start in throwing the earth from the scoop to discharge it. This throwing of the earth is a principal object of my invention, and is accomplished as follows: The wheel F is located at the delivery-point in the path of the chain of scoops. The wheels H and F give direction to the path of the scoops on the ground while gathering earth, and the scoops travel about fifteen feet a second. On reaching the wheel F the direction of the scoops is suddenly changed so that the edges C^2 thereof travel while passing around the wheel F more than twice as fast as the rear ends, D N, do. By this means a sudden throw is given to the scoop, whereby the earth carried therein is tossed away by centrifugal force. This is a reason for carrying my scoops slanting rearward, for if they slanted forward they would not spill their contents by this means.

L represents a spout located in the path of the delivery of the wheel F to direct the earth through its mouth L′ into an attendant wagon or upon the bank along the side of the excavation.

To sustain the scoops in position when they are moving, but not at work, I provide a series of short chains, P, each of which is connected with a low point on the back of one scoop, and with a higher point on the back of the following scoop, as in my Patent No. 306,755. In the present case I find that the scoops require at certain times more freedom than this chain will allow when drawn tight enough to be of service. On this account I interpose a spiral spring, Q, between each pair of scoops as a part of the connection acting in conjunction with the chains P, to which they are attached. By this means a yielding support is obtained which properly restrains the scoops to follow the chains and guide-rails, and yet permits them to pass freely around the wheels. The spout L is raised or lowered by suitable means—such as the rope and winch R. While passing over the delivery-wheel F the bottom of the scoop is nearly radial therefrom, so that the earth may slide out of the scoop by centrifugal force, as described.

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

1. The combination of two or more wheels journaled in an excavator-frame, chains mounted on the said wheels, a guide-rail located nearly parallel with the chains, and a series of scoops pivoted at their upper edges to the chain, and provided each with a shoe or roller to engage the said rail, the relative position of the rail, the chains, the pivotal attachments of the scoops, and the shoe or roller being such as described, whereby the scoops are carried with their bottoms slanting rearward, with the edge of the bottom dragging on the ground while gathering earth, for the purpose specified.

2. An excavator-scoop hung by the upper edge of its back with its bottom slanting rearward to its edge, and provided with sides having curved edges extending from the said upper edge to the said rear edge and curved as low as the latter, substantially as shown and described.

3. The combination of two or more wheels journaled in an excavator-frame, chains passing around the wheels, scoops attached to the chains in position to carry their bottoms nearly radially around the wheels, and a spout slanting upward and away from the machine nearly tangent to one of said wheels in the path of the delivery of the said scoops, substantially as shown and described, whereby earth thrown loose in the air by the scoops will be guided, as described.

4. The combination of two or more wheels journaled on an excavator-frame, chains passing around the wheels, scoops pivoted at their upper edges to the said chains, and elastic connections between adjacent scoops, substantially as shown and described.

The above specification of my invention signed by me in the presence of two subscribing witnesses.

C. HOWARD.

Witnesses:
W. X. STEVENS,
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