(No Model.)

C. A. & F. D. SMITH.

EARTH EXCAVATOR AND CONVEYER.

No. 253,896. Patented Feb. 21, 1882.

Fig. 3.

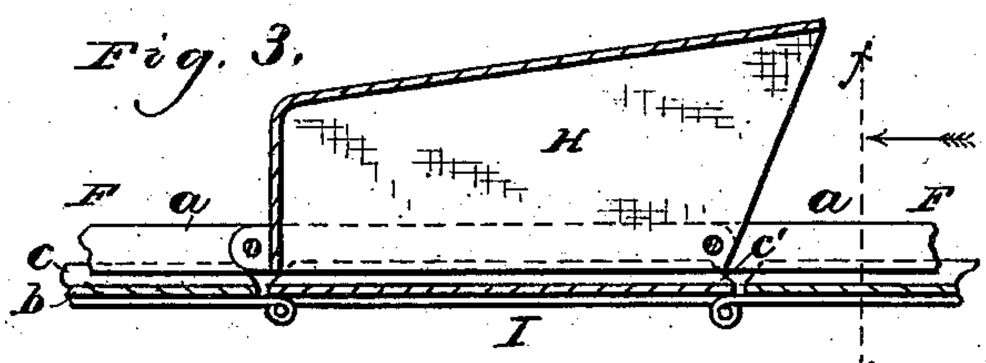


Fig. 4.

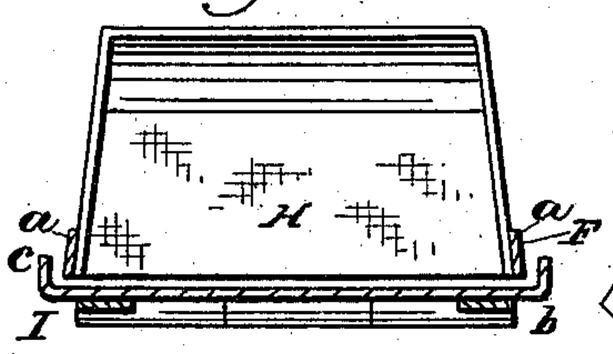
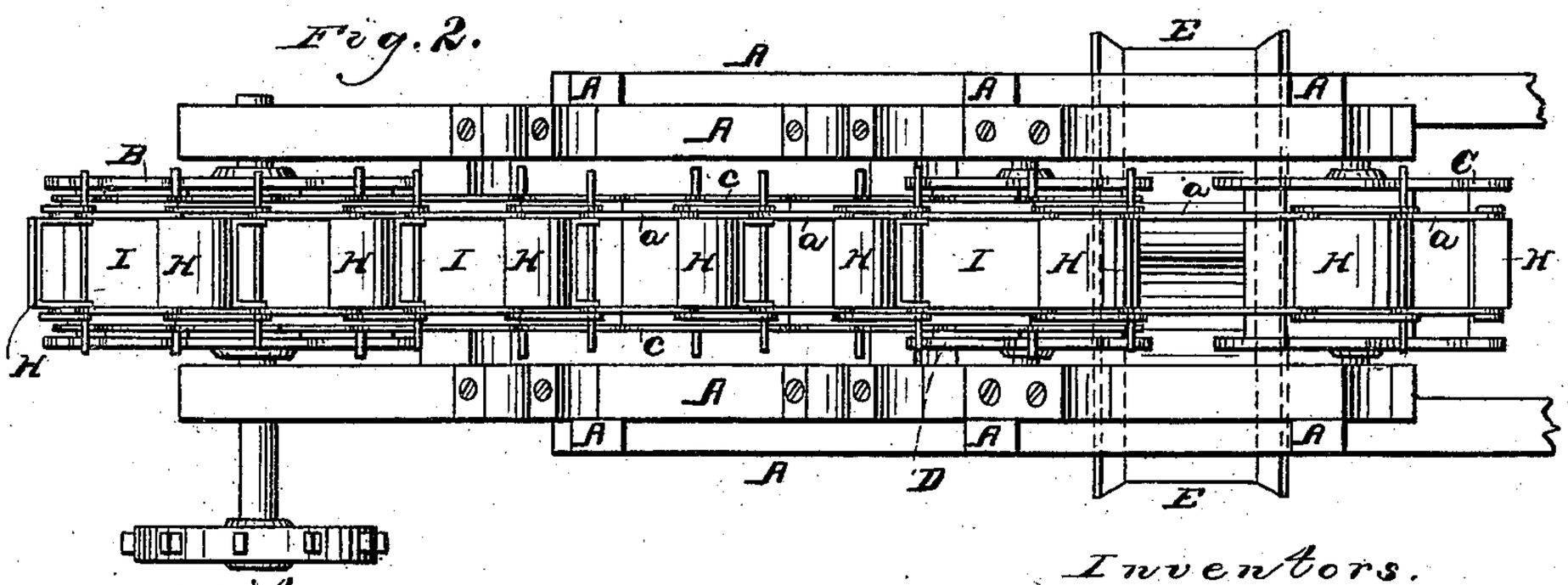


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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EARTH EXCAVATOR AND CONVEYER.

SPECIFICATION forming part of Letters Patent No. 253,896, dated February 21, 1882.

Application filed January 3, 1882. (No model.)

To all whom it may concern:

Be it known that we, CHARLES A. SMITH and FRED. D. SMITH, of New Carlisle, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Earth Excavators and Conveyers, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1 is a side elevation of an earth excavator and conveyer embodying our invention. Fig. 2 is a top or plan view thereof. Fig. 3 is a vertical central section taken longitudinally through one of the excavator-buckets and that part of the independent endless apron or belt serving as a temporary bottom for the buckets; and Fig. 4 is a vertical cross-section in the plane of the line *x x* of Fig. 3, viewed in the direction indicated by the arrow there shown.

Like letters of reference indicate like parts.

Some soils—such as wet earth and clay—are liable to stick in or adhere to the scoops or shovels of excavators, and so impede the work intended to be performed. Our object is to obviate this objection; and our invention consists in the means, substantially as hereinafter set forth, which we employ for that purpose.

A represents the frame, which consists of a suitable base, of uprights each successively longer than the other, and of an inclined top portion, as shown.

B is a sprocket-wheel journaled in the lower or forward end or part of the frame, and C is a spocket-wheel journaled in the upper or rear part or end of the frame.

D is also a sprocket-wheel, turning in bearings located a little way below or forward of the wheel C.

E is a chute located partly underneath the sprocket D.

F is an endless sprocket-chain, consisting of centrally-open links *a a*. This chain passes over the wheels B, C, and D, and over supporting rollers or wheels G G. It will be perceived that only one of the sprocket-wheels—B, for example—need be driven in order to drive the chain F, in which case the others may serve as mere rests or supports, which will be driven by the chain. The direction of movement is indicated by the arrows shown in Fig. 1.

H H are the scoops, shovels, or buckets. These shovels or buckets have open fronts and bottoms. In other respects they are closed—that is to say, the ends which enter the earth in excavating are open, and the parts which are then uppermost, but are lowest while the earth is being conveyed away, are also open. We deem it best, in order to prevent the earth from sticking to the sides of the buckets, to make the sides flaring, as shown in Fig. 4. A bucket or scoop H is attached to each alternate link *a*, or, in other words, the buckets are arranged at suitable distances from each other, and perform the work of excavating, as will be understood, while they are moving underneath the wheel B, and the function of buckets while moving therefrom toward the wheel D.

I is an endless apron or belt arranged underneath the chain F, or between it and the sprocket-wheels, as shown. This apron or belt passes over the sprocket-wheels B and D, but not over the sprocket-wheel C. It therefore passes over a shorter circuit than that of the chain F. The apron or belt I we make of metallic links *b b*, hinged together at their meeting edges, and corresponding in length and width to the shovels or buckets H H. These plates serve as automatically-detachable bottoms for the shovels or buckets H H respectively while the latter are performing the function of conveyers, and are adapted to move along with the buckets as the drive-wheel is rotated. They also meet the buckets at the proper time, but in other respects the chain F and its scoops or buckets are entirely independent of the apron or belt I. We also turn up the edges of the plates or bottoms *b b*, as is clearly shown at *c* in Figs. 3 and 4, so that they will overlap or receive the lower edge of the buckets, thus preventing the latter from slipping laterally, and more securely closing the bottoms thereof while the earth is being carried toward the sprocket-wheel D. We deem it best to round off or bevel the adjacent ends of the flanges *c c*, as shown at *c'*, so that these ends will not interfere with each other in case of the sagging of the parts carrying the load.

It will now be perceived that the scoops, shovels, or buckets H H will perform the function of scoops or shovels and scoop or shovel

up the earth while they pass underneath the wheel B; that the apron or belt I will automatically meet the buckets in time to close the bottoms thereof and support the earth therein while they move from the sprocket-wheel B to the wheel D; that as the belt or apron I moves around the wheel D it automatically leaves the buckets H H, thus rendering them bottomless, and that the earth will then fall by its own gravity into the chute E, which in turn will deliver it at any desired point or place. The movement of the belt or apron I around the wheel D also tends to throw the earth into the chute E.

To accomplish these results by means substantially such as shown and now described is the object of our invention, and we do not here intend to restrict ourselves to mere details of construction; but,

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in an earth excavator and conveyer, of an endless chain, F, carrying bottomless scoops, shovels, or buckets H H, and an independent apron or belt, I, supported against or directly underneath and traveling with the said buckets during only a part of their upward travel, substantially as and for the purposes specified.

2. The combination, in an earth excavator and conveyer, of an endless chain consisting of centrally-open links carrying bottomless buckets H H, the independent endless apron or belt I, made shorter than the chain F, the chute E, and the wheels B, C, and D, the wheels B and C carrying the chain F, and the wheels B and D carrying the belt I, all arranged substantially as shown and described with relation to each other, for the purposes set forth.

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