(No Model.)

2 Sheets—Sheet 1.

C. H. SMITH, dec'd.

A. J. MENNELL, Administrator.

Elevator.

No. 236,607. Patented Jan. 11, 1881.

FIG. 1.

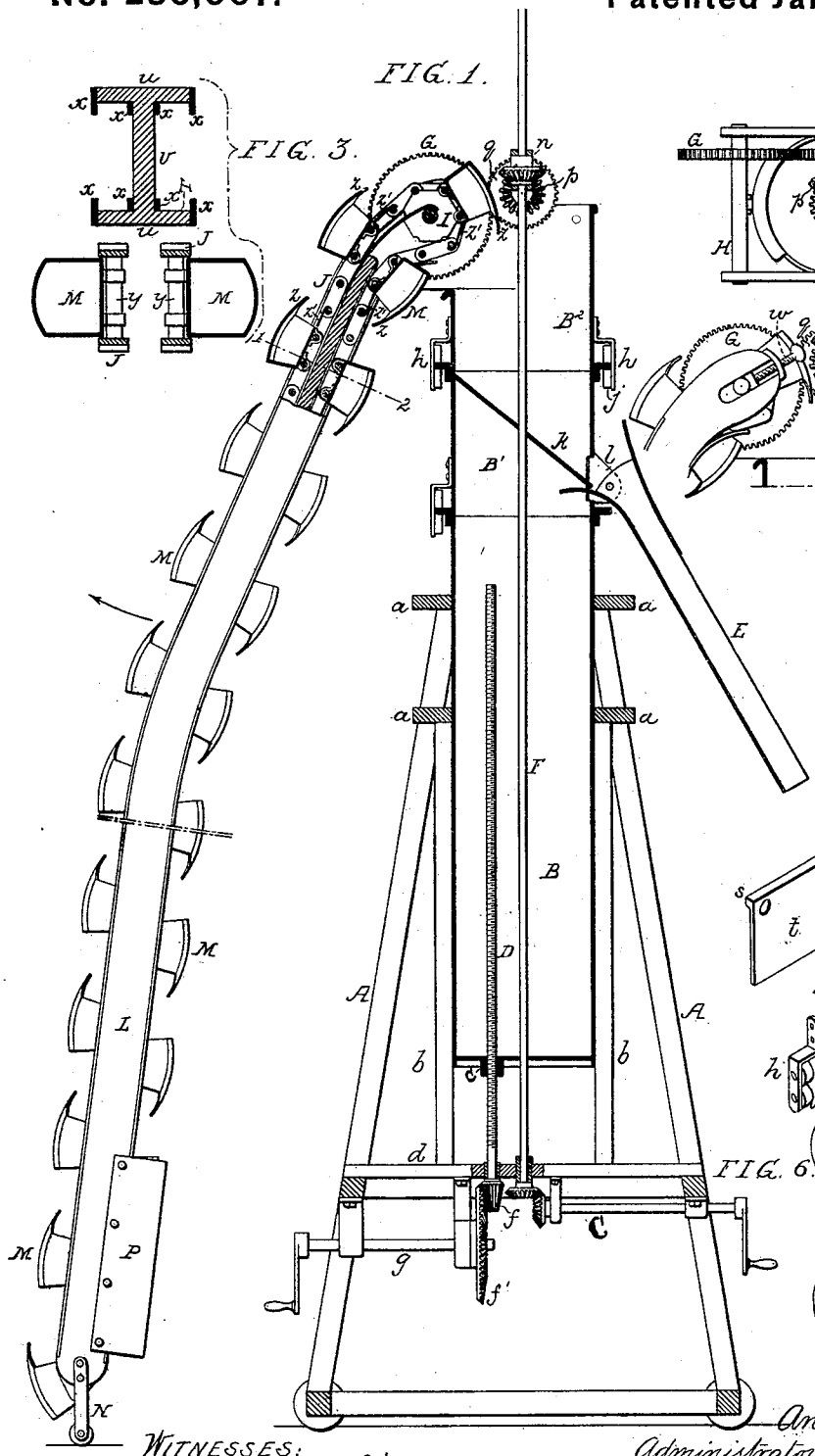


FIG. 3.

FIG. 2.

FIG. 4

FIG. 5.

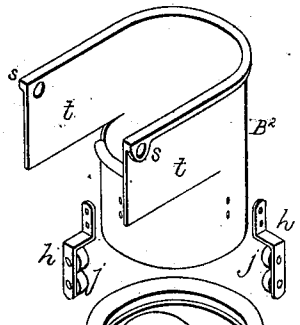
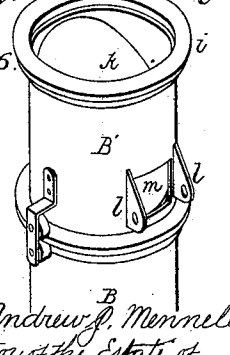


FIG. 6.



WITNESSES:
James F. Tobin
Henry Howson Jr.

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Administrator of the Estate of
Charles H. Smith, deceased
by his Attorneys.
Howson and Son

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

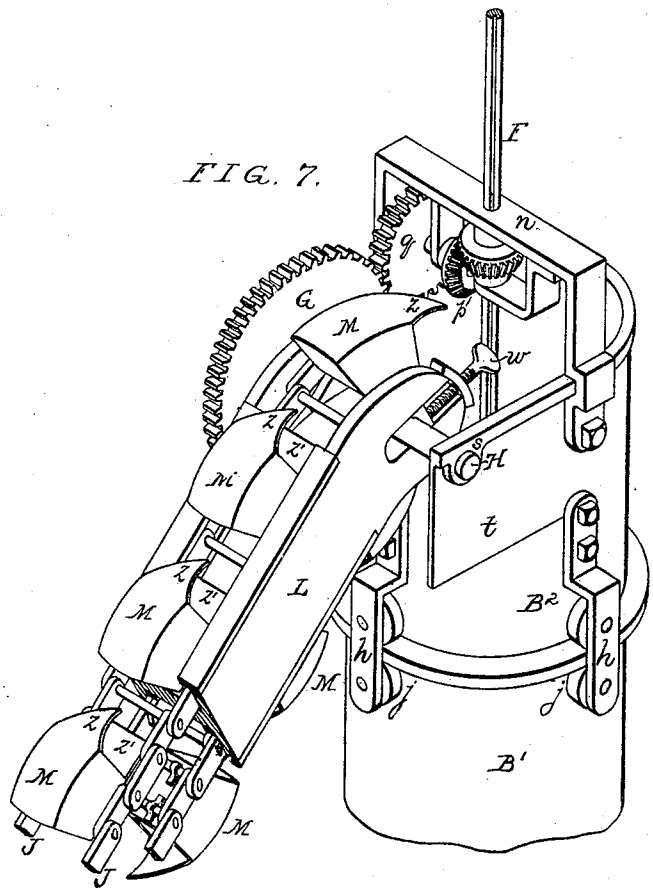
C. H. SMITH, dec'd.

A. J. MENNELL, Administrator.

Elevator.

No. 236,607. Patented Jan. 11, 1881.

FIG. 7.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW J. MENNELL, OF FARIBAULT, MINNESOTA, (ADMINISTRATOR OF CHARLES H. SMITH, DECEASED,) ASSIGNOR TO GEORGE W. WOOD, OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 236,607, dated January 11, 1881.

Application filed October 4, 1880. (No model.)

To all whom it may concern:

Be it known that CHARLES HORACE SMITH, formerly of Faribault, Rice county, Minnesota, and a citizen of the United States, but now deceased, did, during his life-time, invent certain Improvements in Elevators, of which the following is a specification.

This invention consists of certain mechanism and appliances, fully described hereinafter, for elevating coal and other material from the holds of vessels and discharging the same into cars, barges, or other receptacles; and the main object of the invention is to so construct the apparatus that it can be readily adjusted in respect to the mass of material to be elevated and in respect to the cars or other receptacles which have to receive the said material.

In the accompanying drawings, Figure 1, Sheet 1, is a vertical section of the improved elevating apparatus; Fig. 2, a top view of the same; Fig. 3, a transverse section on the line 1 2; Figs. 4, 5, and 6, detached views of parts of the apparatus; Fig. 7, Sheet 2, a perspective view of the upper portion of the elevator.

A substantial frame, A, is furnished at the base with wheels which may be adapted to a track on a wharf or in any other locality where the use of the machine about to be described will be available; or the frame may in some cases be fixed or permanent.

To guides *a a* and *b b*, attached to or forming part of the main frame, is adapted the sliding frame B, which is preferably made in the form of a hollow cylinder, of either wood or metal, and which admits of being raised and lowered, but cannot be turned in its guides in the main frame. The sliding frame B is operated by a vertical screw-shaft, D, Fig. 1, adapted to a nut, *c*, secured to the bottom of the said frame, the shaft having its bearing in the cross-bar *d* of the main frame, and being furnished with a bevel-pinion, *f*, gearing into the wheel *f'* on a shaft, *g*, which may be driven by hand or power.

On the top of the sliding frame B, and admitting of being turned thereon, is a cylinder, B', and on the top of the latter is another cylinder, B^2, capable of being turned independently of that below. The manner adopted in the present instance of connecting the cylinders together and the lower cylinder to the frame B will be best understood by reference to Figs. 5 and 6.

To the side of the cylinder B^2 are secured, at equal distances apart, the three plates *h*, and each of the latter carries two anti-friction rollers, *j j*, in the space between which the flange *i* of the lower cylinder, B', fits freely, the two cylinders being retained in coincidence with each other by the free fitting of a small portion of the upper cylinder into the lower cylinder, and the same plan is adopted in connecting the lower cylinder, B', to the sliding frame B.

An inclined plate or diaphragm, *k*, extends across the interior of the lower cylinder, B', and near the lower edge of this plate a spout, E, is hinged to projections *l l* on the side of the cylinder, which has between the said projections an opening, *m*, communicating with the spout, the upper end of the latter being funnel-shaped, so that whatever is admitted to the uppermost cylinder, B^2, must pass through the spout, whether the latter be adjusted to the inclination shown or to any other inclination within reasonable limits.

Through the sliding frame B and the two cylinders B' B^2 passes a vertical shaft, F, which has its lower bearing in the cross-bar *d* of the frame and its upper bearing in a cross-piece, *n*, secured to the top of the upper cylinder, B^2. The shaft F is driven, as occasion may require, by hand or power, from a horizontal shaft, C, through the medium of bevel-wheels.

In suitable bearings on the top of the cylinder B^2 is a horizontal shaft carrying a bevel-wheel, *p*, which gears into a similar wheel on the vertical shaft F, the latter being arranged to slide through, but to turn with, the said wheel. On the same shaft which carries the wheel *p* is a cog-wheel, *q*, gearing into a larger wheel, G, on a shaft, H, which is arranged to turn in bearings *s s* on wings *t t*, projecting from the upper cylinder, B^2, there being an opening or recess in the side of the cylinder, between the wings, for admitting the gearing and for permitting the buckets, referred to

hereinafter, to discharge their contents into the cylinder. (See Fig. 5.)

L is the bucket-frame, consisting of two side pieces, *u u*, and the cross-piece *v*, as shown in the enlarged sectional view, Fig. 3, the lower end of this frame being provided with bars N, carrying anti-friction rollers, and the shaft H, passing through slots in the frame, at the upper end of the latter. This bucket-frame may be continued downward below the base of the main frame A. It may, for instance, be long enough to extend into the hold of a vessel moored at the wharf on which the main frame is situated, the rollers of the bars N resting on the bottom of the hold. The bucket-frame may also be provided with one or more joints to facilitate the adjustment of the lower end of the same. Grooves are formed in the opposite sides of the bucket-frame, between plates *x x* secured to the said frame, and in these grooves traverse two endless chains, J J, the links of the two chains being connected together at intervals by rods *y*.

Buckets M are connected to the two endless chains at intervals by attaching each bucket to two of the rods *y*, as best observed in Fig. 3. The chains pass over a barrel, I, or over pulleys on the shaft H, the barrel or pulleys being preferably of hexagonal form, with sides of a length properly proportioned to the links of the chains, and there is at the lower end of the bucket-frame a pulley, round which the chains pass. The chains may be tightened or loosened as required by operating-screws *w*, which are adapted to threaded openings in the upper ends of the side bars, *u*, of the bucket-frame L, and act upon blocks which slide in the slots of the said bars and bear upon the shaft H, so that by operating the screws so as to elevate the frame L the chains J will be loosened, and vice versa.

Near the lower end of the bucket-frame there is a shield, P, which prevents the material to be elevated—coal or grain, for instance—from reaching the buckets until bucket after bucket turns at the bottom of the frame and receives its load. In the absence of this shield the bucket would be compelled to pass through a mass of the material to be elevated, thereby unnecessarily absorbing much of the power required to drive the endless chains. The shield P may be constructed so as to bear against the edge of the hatchway of a vessel, into the hold of which the bucket-frame L is introduced, thereby preventing any interference with the operation of the elevator due to the contact of the noses of the buckets M with the said edge of the hatchway. The nose *z* of each of the buckets M is preferably made of steel, and is curved and pointed, as shown in Fig. 7, so as to facilitate the entrance of the bucket into a mass of granular material and aid in filling the bucket, and in advance of each bucket M is an apron, *z'*, which extends transversely from one chain J to the other, and from the front edge of the bucket to the rod *y* in advance of the same, so that as the bucket is turning at the top of the frame L the premature discharge of its contents is prevented.

The important feature of the invention is the facility with which the apparatus can be adjusted, as the locality of the material to be raised and the point where it has to be discharged may suggest. If a coal-vessel, for instance, has been moored near the wharf on which the apparatus is placed, the whole of the latter can be, in the first instance, adjusted to a position where it will be most available, after which the bucket-frame can be moved outward in the direction of the arrow or inward in a contrary direction, or can be turned laterally with the upper cylinder, B^2, or can be raised or lowered by operating the screw-shaft D, as the position of the hatchway, into which the lower end of the bucket-frame has to be introduced, may suggest. The bucket-frame having been adjusted, the point where the elevated coal has to be discharged must be considered, and the spout E can be moved accordingly. It can, for instance, be turned on its pivot so as to assume the most convenient angle, or it can be turned laterally with the cylinder B' to any position which that of the car, barge, or other receptacle may suggest as the most convenient.

It will be seen that the coal, grain, or other material raised by the bucket will fall into the upper cylinder, B^2, and onto the inclined plate *k*, and thence pass through the spout E to its destination, bucket after bucket, as it turns at the top of the frame L, tilting its load into the upper cylinder, B^2.

I claim as the invention of said C. H. SMITH—

1. The combination, in apparatus for raising coal, of a bucket-frame with a cylinder which admits of being revolved on a supporting structure, and to which said bucket-frame is pivoted, substantially as described, so that the said cylinder may receive the contents of the buckets, as set forth.

2. The combination of the bucket-frame and its endless chain of buckets with the cylinder or receiver B^2 and the cylinder B', with its adjustable spout, the said cylinders admitting of being turned independently of each other and of the structure which supports them, substantially as specified.

3. The combination of the vertically-adjustable sliding frame B, the cylinder B', admitting of being turned on the said frame and provided with a spout, the cylinder or receiver B^2, admitting of being turned on the said cylinder B', and the bucket-frame with its endless chain of buckets, substantially as specified.

4. The combination of a main frame, A, a frame, B, arranged to slide vertically therein, the cylinders B' B^2, the shaft H, carried by the upper cylinder, the central vertical shaft, F, and gearing, whereby motion may be imparted from the said shaft F to the shaft H, all substantially as set forth.

5. The combination of the cylinder B^2, the

opening in the side of the same, and wings *t t*, projecting from the edges of the said opening, with the chain-barrel shaft having its bearings in the said wings, all substantially as described.

6. The combination of the cylinder B′, its outlet, and the inclined plate *k*, permanently fixed in the cylinder in respect to the outlet, with the spout E, having a funnel-shaped end pivoted to the cylinder at the outlet, all as set forth.

7. The combination of the cylinder B^2, the flanged cylinder B′, and the plates *h*, secured to the said cylinder B^2, and carrying rollers *j*, adapted to the flange of the lower cylinder, all substantially as specified.

8. The combination of the bucket-frame L, the endless chain J, the buckets M, and the aprons *z*′, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW J. MENNELL,
Administrator of estate of Charles H. Smith, deceased.

Witnesses:
WALTER W. GREENE,
JOHN H. CASE.