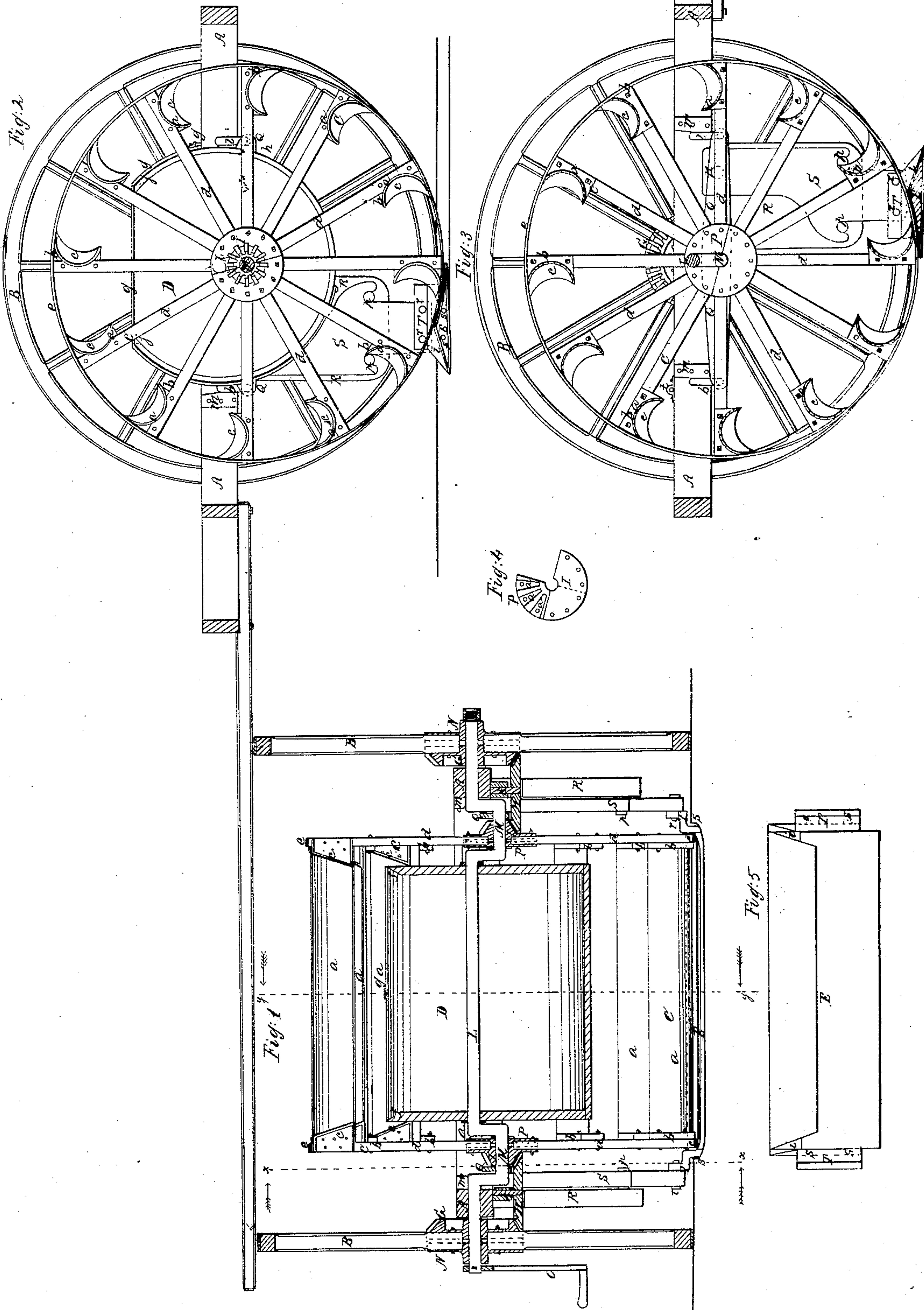


J. S. Brown.

Excavator.

N^o 17,486.

Patented Jun. 9, 1867.



UNITED STATES PATENT OFFICE.

J. S. BROWN, OF WASHINGTON, DISTRICT OF COLUMBIA.

SELF-LOADING CART.

Specification of Letters Patent No. 17,486, dated June 9, 1857.

To all whom it may concern:

Be it known that I, J. S. BROWN, of Washington, in the District of Columbia, have invented a new and Improved Self-Loading Cart; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, Figure 1, being a vertical section of the machine, in the plane passing through the center line of the axle; Fig. 2, a vertical section thereof, in the plane indicated by the line *x, x*, Fig. 1; Fig. 3, a vertical section, in the plane indicated by the line *y, y*, Fig. 1, the cart-box being removed; Figs. 4 and 5, views of parts detached.

Like letters designate corresponding parts in all the figures.

An ordinary frame A, is employed; across which an axle L extends, and receives the supporting and driving wheels B, B, outside thereof, in any usual manner. Just inside of each side piece of the frame, the axle L is bent into the form of a crank M. Both cranks extend in the same plane, and at the same angle, from the axle; and their wrists are one half as far from the central line of the axle as it is desired to raise the scraper and elevator (as hereinafter described), previous to transporting the loads. Ordinarily, it will not be necessary to raise them more than one foot from the ground; in which case, the eccentricity of the cranks would be six inches. Upon these cranks the lifting bars Q, Q, (from which the scraper E, is suspended,) together with the elevator wheels C, C, are mounted. The cranks pass through said bars Q, Q, near the centers thereof; and two balance, or guide, cranks *l, l*, turning in bearings in the side pieces of the frame, and having the same extent of eccentricity as, and being situated in parallel planes with, the cranks M, M, respectively receive the ends of the bars, substantially as shown in Figs. 2 and 3. These auxiliary guide cranks necessarily keep the bars continually in horizontal positions, whereby the central cranks M, M, are enabled to lift and lower the bars easily and without strain. When the elevator and scraper are in the position for working, the cranks M, M, are in their lowest position, as shown in the drawings; and when raised away from the ground, for the purpose of allowing the cart to be drawn along, the cranks are in their highest position.

Hence, it is necessary to turn the axle only one half a revolution, in changing from one position to the other. This movement is made toward the rear of the cart. Blocks, or stops, *m, m*, are, therefore, secured to the sides of the frame, as shown; against which the cranks *l, l*, bear, both when in their upper and lower positions. The pressure of the earth against the scraper E, will keep the cranks *l, l*, continually bearing against the stops, when loading the cart; and when the cranks are elevated, the stops may be so shaped as to allow the cranks to pass a little beyond their poising position, so that the weight of the parts will keep them in place. But to insure their being kept in their raised position, a spring catch *t*, (Fig. 3,) may be placed on the frame A, so as to spring behind one of the cranks *l*, when raised, and thus prevent its returning till the catch is withdrawn by the driver. The axle is turned, for raising and lowering the scraper and elevator, by means of a winch O, (Fig. 1,) attached to one end of the axle, which projects through the nigh wheel B. If desired, this winch may be arranged so as to be readily removed, when not to be used, and attached only when required for immediate use.

The scraper E, may be made of wood covered with sheet-metal, or entirely of metal. It is provided, at the ends, with ears, or flanges, T, T, projecting outward and upward, which are respectively secured by pins, or bolts, *r, r*, to the lower ends of hangers S, S, whereby the scraper is suspended from the bars Q, Q. These hangers are respectively connected with the said bars by strong pivots *n*, as shown in Fig. 3; so that the hangers may turn a little thereon, this being rendered necessary by the curved paths in which the upper ends of the hangers are caused to move. The hangers are kept firmly in their positions, by being situated, near their lower ends, between strong pins, or studs, *p, p*, projecting from strong and firm brace-bars R, R, which extend downward from the sides of the frame, substantially as represented in the drawings.

The scraper, instead of having a straight edge for cleaving the earth, may be provided with pointed teeth; and in most soils, this construction is probably preferable to the simple edge. If it is desired to vary the depth to which the scraper will enter the earth, the rear edge may be elevated

higher than represented, and the front portion be hinged thereto, so as to adjust its edge to any depth required. The front portion of the upper surface of the scraper is inclined, for the purpose of lifting the earth to a sufficient height to be received by the scoops of the elevator. The hind portion of the upper scoop-surface, is concave, and concentric with the center of the elevator's motion, and so arranged, in connection therewith, that the scoops *a, a, a*, of said elevator will pass nearly in contact therewith, as shown in the drawings. The width of the concavity should be nearly, or quite, as great as the distance between adjacent scrapers, so that all the earth, as fast as raised to the summit of the scraper, will be caught by the successive scoops, and carried up thereby.

The elevator is constructed with two wheels *C, C*, each composed of as many spokes *d, d, d*, as there are required to be of scoops *a, a, a*. The spokes are secured together, at the center of each wheel, by flanges *I, P*, each being divided into halves, which are joined at right-angles to those on the opposite side of the wheel, as shown most clearly in Fig. 4, so that by inserting the spokes in grooves *a, a, a*, in their inner surfaces, and passing a bolt through each spoke and the adjacent halves of the flanges, the whole will be securely united. This construction is employed to enable the wheels to be readily put together around the cranks of the axle. Bands *e, e*, may, if desired, be passed and secured around the outer ends of the spokes. The scoops *a, a, a*, are made of sheet or cast-iron, hollowed into such a form as to enable them to receive the earth from the scraper, and convey it up over the receptacle, or cart-box, *D*, with little or no waste thereof by spilling, and, at the same time, empty the earth into the receptacle, as they pass over it. They may be secured to the spokes *d, d, d*, in any convenient manner; such as, for instance, by nailing them to blocks *b, b, b*, which are bolted to the sides of the spokes, as represented in the drawings.

The motion is imparted to the elevator in the following manner: A bevel-wheel *G*, is secured to the inside of each driving wheel *B*. This may form, or be cast with, the flange, which, together with a simple flange *N*, on the outside of the wheel, serves to unite the spokes thereof, instead of a hub. A similar bevel-wheel *I* is cast on, or composes, the outer flange of each wheel *C*, of the elevator, as represented. The respective sizes of each pair of bevel-wheels *G, I*, should be such as to produce the requisite relative velocities of the driving wheels and elevator, and, at the same time, bring their lower edges opposite to each other, when the elevator is down, so that a horizontal

bevel-wheel *H*, turning on a pivot *k*, which extends downward from the frame *A*, may connect said wheels. The motion of the driving wheels, therefore, as the cart advances, communicates the desired motion to the elevator. When the elevator is raised, as above described, to enable the load to be transported, the bevel-wheels *I, I*, become ungeared from the connecting wheels *H, H*, so that the elevator does not revolve, when the cart is merely passing along from place to place. Only a set of bevel-gear on one side of the cart may be necessary; since, although a set on each side would drive both ends of the elevator more equally, two sets can not both be so readily brought into gear, nor would they allow the cart to turn much while loading.

The cart-box, or receptacle, *D*, is cylindrical, or nearly so, and is suspended, at its center, upon the axle *L*, within the elevator, substantially as shown. Its length is sufficient to extend the whole distance between the cranks *M, M*, and its diameter, as great as may be without touching the scoops of the elevator, in any position thereof. A segment of the upper side of the cylinder is wanting, thus making an opening, through which it is filled and discharged; and this form renders the lower side the heavier, so that it will remain balanced right-side up, whether empty or full. The difference between the weight of the lower side and upper side, when loaded, should not be so great, but that the attendant may easily turn it upside down, by drawing upon a cord, or chain, *g*, which passes from near the bottom, up around its periphery, and over the top, so as to be reached from behind the cart, in the manner indicated in the drawing. In order to avoid the pressure of the contents against the axle *L*, inside of the receptacle, which would thus render it difficult to turn, the receptacle may have a tube surrounding said portion of the axle, the bore thereof being a little larger than the axle, so as not to touch it.

Since the length of the elevator must be somewhat greater than that of the receptacle, and the scraper should remove a space of earth at least as wide as the elevator extends, a greater width of earth will be raised than will naturally fall into the receptacle. To collect all the earth thus raised by the scraper, first, the ends of the scraper may have wings, or mold-boards *i, i*, to turn the outermost earth inward near the middle of the scraper; then, the ends *c, c, c*, of the scoops, may be arranged obliquely therein, as represented, so as to throw the earth still farther toward the middle, as it is turned from the outer to the inner edges of said scoops; and, finally, the ends of the receptacle may be beveled from the inside outward, at their upper edges, as at *f, f*, Fig. 1,

so as to catch the earth falling from the scoops even to the extreme edges of said beveled ends. Instead of thus collecting and raising the outer edges of the earth
5 slice, there may be simple wings on the ends of the scraper, to turn the earth outward, so as to leave an unencumbered path for the elevator. Or the elevator and scraper may be so arranged that the former will not
10 reach the general surface of the ground, and thereby render either device above described unnecessary.

I do not claim a revolving elevator, nor a scraper, alone; but

15 What I claim as my invention, is—

1. The combination of a revolving elevator and a scraper, substantially in the manner specified.

20 2. I also claim the employment of the cranks M, M, on the axle, for the purpose of

raising and lowering the elevator and scraper, by simply turning the axle half a revolution.

3. I also claim the use of the winch O, attached to the projecting end of the axle, 25 for the purpose of giving the proper movement to said axle, in the manner herein described.

4. I also claim the arrangement of the lifting bars Q, Q, cranks M, M, l, l, hangers 30 S, S, and brace-bars R, R, substantially in the manner and for the purpose set forth.

5. I also claim the stops m, m, on the frame A, arranged in combination with the cranks l, l, substantially in the manner and 35 for the purpose specified.

J. S. BROWN.

Witnesses:

JOHN S. HOLLINGSHEAD,
SAML. GRUBB.