(No Model.)

P. B. BRADLEY.

APPARATUS FOR HANDLING FERTILIZERS AND OTHER GRANULAR SUBSTANCES.

No. 345,479. Patented July 13, 1886.

Fig. 2.

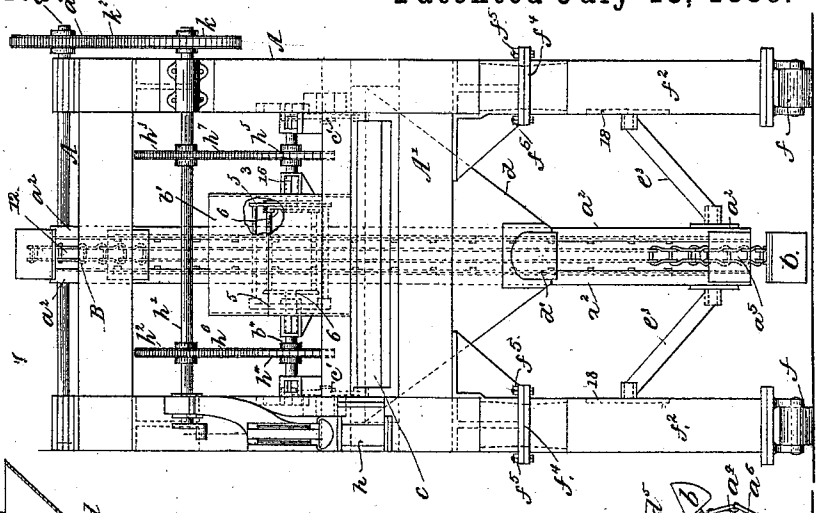


Fig. 3.

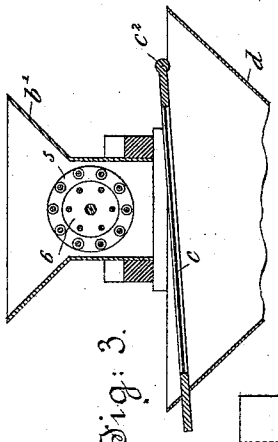
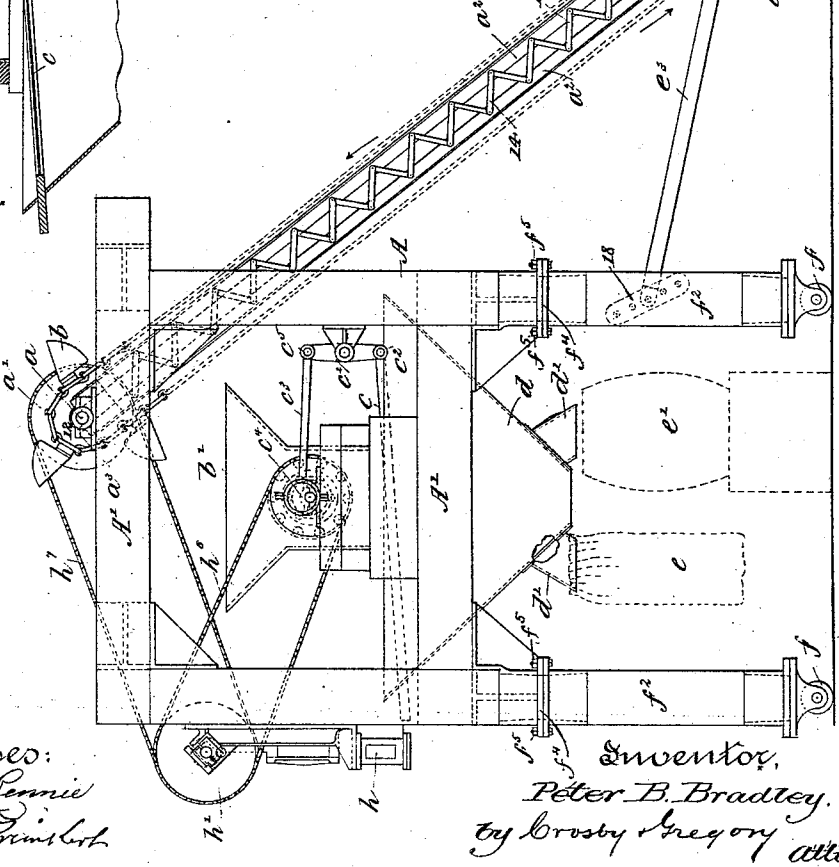


Fig. 1.



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UNITED STATES PATENT OFFICE.

PETER B. BRADLEY, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR HANDLING FERTILIZERS AND OTHER GRANULAR SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 345,479, dated July 13, 1886.

Application filed December 14, 1885. Serial No. 185,678. (No model.)

To all whom it may concern:

Be it known that I, PETER B. BRADLEY, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Apparatus for Handling Fertilizers and other Granular Material, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a portable apparatus by which guano or other fertilizer or granular substance may be automatically deposited in bags or usual receptacles for transportation.

My improved apparatus consists, essentially, of a frame-work preferably made movable, a ladder-frame, an endless chain of buckets carried by said ladder, devices for actuating said chain of buckets, and a chute to direct into bags or equivalent receptacles the material elevated by the buckets. I have shown the frame-work as made in two parts, so that it may be divided vertically when it is desired to move the frame-work from one into another room, and I have also shown the frame-work as provided with an agitator located in a hopper, the agitator being adapted to break up any lumps in the material lifted by the buckets of the chain, and I have also provided a screen to screen or sieve the material on its way to the chute. I have also provided the frame-work with a small portable engine, which furnishes motive power for the entire apparatus.

The particular features in which my invention consists will be specifically pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of an apparatus embodying my invention; Fig. 2, an end view of Fig. 1, looking from the left; and Fig. 3, a sectional detail to be referred to.

The uprights A and cross-beams A′ form a frame-work to support the operative parts to be described. The shaft *a*, mounted in suitable bearings on the beam A′ at the top of the frame-work, has secured to it a sprocket-wheel, *a′*, and also the chain-wheel 12. The shaft *a* also serves as the fulcrum for the boxes to which are attached the upper ends of the beams or timbers constituting the ladder or chain carrier. The ladder is composed of side pieces, a^2 a^2, attached at their ends to like boxes, a^3, the box at the lower end of the ladder receiving the shaft a^4, carrying the chain-wheel a^5. The side pieces are further joined by braces 14. The side pieces, a^2 a^2, of the ladder-frame receive between them the endless chain B, provided at suitable intervals with buckets *b*, made to resemble scoops, only a few of said buckets being shown, they and part of the chain B being omitted to save space on the drawings. The endless chain is passed over the chain-wheels 12 and a^5. The lower end of the ladder, which serves as a bearing, a^3, for the shaft a^4, has attached to it the links e^3, the opposite ends of which are adjustably attached to the plates 18, adjustment of the links e^3 enabling the lower end of the ladder to be moved in the arc of a circle to place the shaft a^4 and buckets more or less close to the floor on which the fertilizer or other material lies. The material taken up by the buckets is discharged therefrom into the hopper *b′*, containing within it an agitator, herein shown as composed of oppositely-rotating disks 5 and 6, connected together by rods and shaped as drums, one of said drums being inclosed within the other, as shown in dotted lines, Fig. 2, and in section, Fig. 3, the smaller drum being rotated by the shaft b^3, and the larger drum by the shaft b^4. The rods of the agitators serve to break up any large lumps or cakes. The material, after being acted upon by the agitator, falls upon a sieve, *c*, of ordinary construction, it being herein shown as jointed at c^2 to levers *c′*, actuated through rods c^3 by eccentrics c^4 on the shafts b^3 b^4, said levers being pivoted to the said rods, as at c^5, the throw of the eccentric producing a vibratory movement of the sieve *c*. The material passed through sieve *c*, if used, as I prefer, enters the chute *d*, from whence it passes through suitable mouths, *d′*, into bags *e*, or it may be into barrels *e′*, where it is ready for transportation.

As herein shown, the standards A are mounted upon extensions f^2, provided with casters or rollers *f*, by which the apparatus may be easily moved from one position to another. As herein shown, the said extensions and standards are joined together by flanged plates f^4, secured by bolts f^5, thus enabling the extensions f^2 to be removed, so that the appa-

ratus may be shortened in length, to enable it to be passed through a door or from one part of a building to another.

A small steam-engine, *h*, secured to the apparatus in any suitable manner, has its connecting-rod secured to a crank on the shaft *h'*, said shaft having mounted upon it sprocket-wheels h^2 h^3, the reciprocation of the connecting-rod of the engine *h* rotating the shaft *h'* and sprocket-wheels mounted thereon. The sprocket-wheel h^2 is connected to and rotates a sprocket-wheel, h^4, on the shaft b^4 by means of a chain, h^6, passed over said wheels; and the wheel h^3 is connected to and rotates the sprocket-wheel h^5 on the shaft b^3 by means of a chain-wheel, h^7, passed over said wheels. The shaft *h'* has also mounted upon it a chain-wheel, *k*, herein shown as located at the side of the frame-work, (see Fig. 2,) said wheel being connected to the sprocket-wheel *a'* by a chain, k^2, the rotation of the shaft *h'* also rotating the wheel *a'*, the shaft *a*, and the chain-wheel 12, fast on said shaft, the rotation of the chain-wheel 12 causing the endless chain of buckets to travel over the ladder.

I claim—

1. In a machine for handling fertilizers and other granular material, a frame-work, a ladder, an endless chain having buckets, and means to move said chain, combined with a hopper into which the said material is discharged, and an agitator to break up and agitate the said material, and a chute, to operate substantially as described.

2. In a machine for handling fertilizers and other granular material, a frame-work, a ladder, means to adjust the said ladder at its lower end, an endless chain having buckets carried by the said ladder, and means to move the said chain, combined with a sieve, and means, substantially as described, to operate the said sieve, as and for the purpose set forth.

3. In a machine for handling fertilizers and other granular material, a frame-work, a ladder, means to adjust the said ladder at its lower end, an endless chain having buckets carried by the said ladder, and means to move the said chain, combined with a hopper to receive the material from the said buckets, an agitator in said hopper, a sieve located below said hopper, and a chute, to operate substantially as described.

4. In a machine for handling fertilizers and other granular material, a frame-work, a ladder, an endless chain having buckets, and means to move said chain, combined with a chute to receive the material carried by said buckets, substantially as described.

5. In a machine for handling fertilizers and other granular material, a frame-work provided with detachable extensions, a ladder, and an endless chain having buckets, and means to move said chain, combined with a hopper, an agitator, and a chute, to operate substantially as described.

6. The frame-work having detachable extensions, a ladder, an endless chain having buckets, and means to move said chain, combined with a hopper, an agitator to break up said material, and a sieve located below said agitator, to operate substantially as described.

7. The frame-work having detachable extensions, a ladder, means to adjust said ladder at its lower end, an endless chain having buckets, and means to move said chain, combined with a hopper, an agitator, and a chute, substantially as described.

8. The frame-work having detachable extensions, a ladder, means to adjust said ladder at its lower end, an endless chain having buckets, and means to move said chain, combined with a hopper, an agitator, and a sieve located below said hopper, and a chute, substantially as described.

9. The frame-work having detachable extensions, a ladder, an endless chain having buckets, and means to move said chain, combined with a chute to receive the material carried by said buckets, substantially as described.

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

PETER B. BRADLEY.

Witnesses:
G. W. GREGORY,
I. H. CHURCHILL.