

No. 731,539.

PATENTED JUNE 23, 1903.

T. BROWN.
MANURE SPREADER.

APPLICATION FILED MAR. 2, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

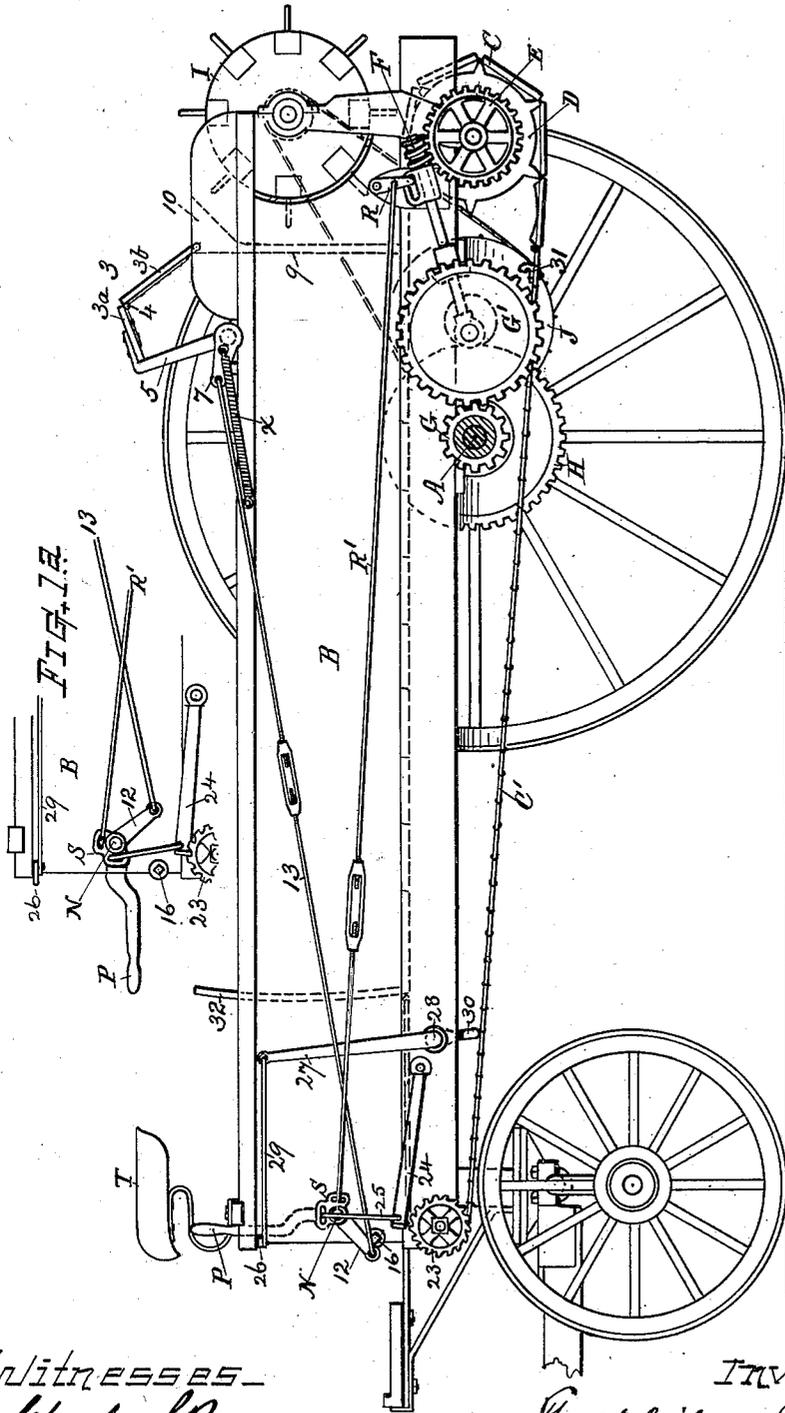


FIG. 1.

Witnesses—
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Simon & King

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Theophilus Brown
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Attorney

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3 SHEETS—SHEET 2.

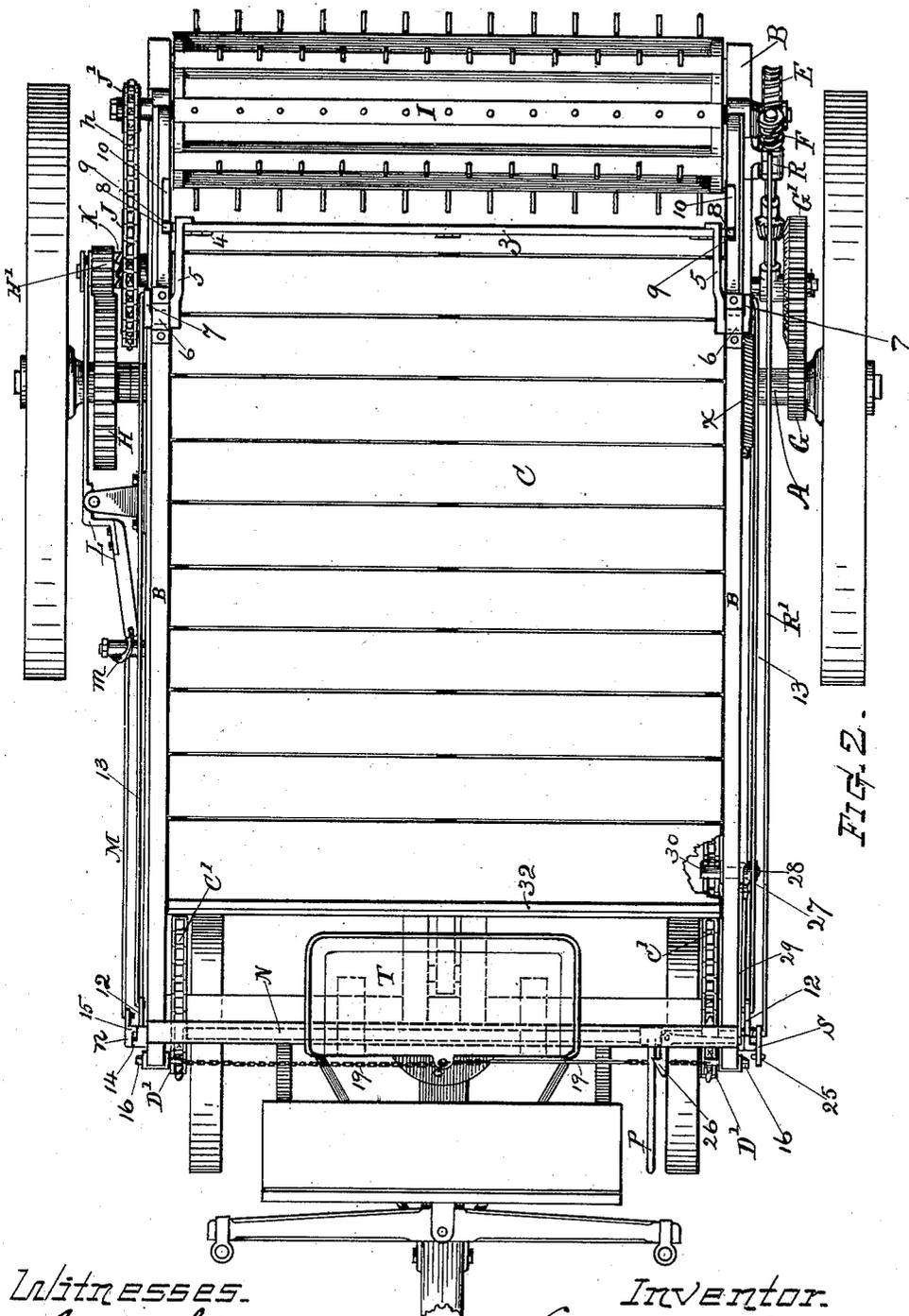


FIG. 2.

Witnesses.

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NO MODEL.

3 SHEETS—SHEET 3.

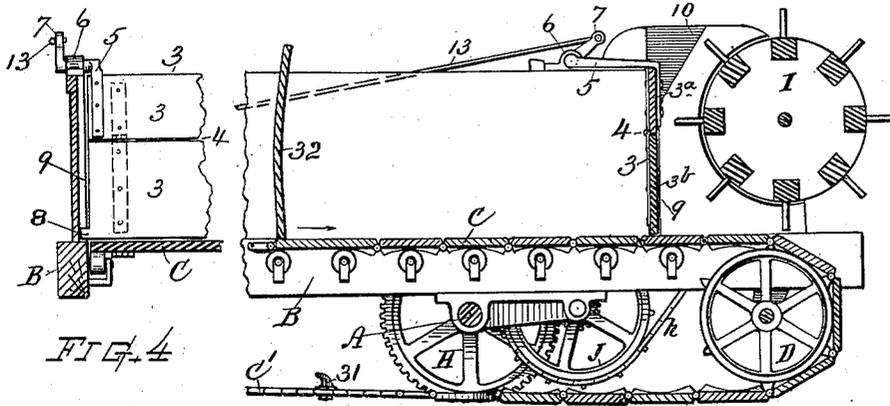


FIG. 4

FIG. 5

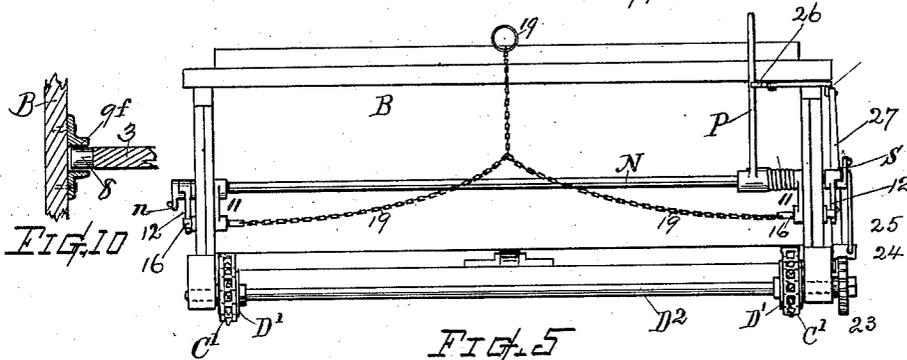


FIG. 6

FIG. 7

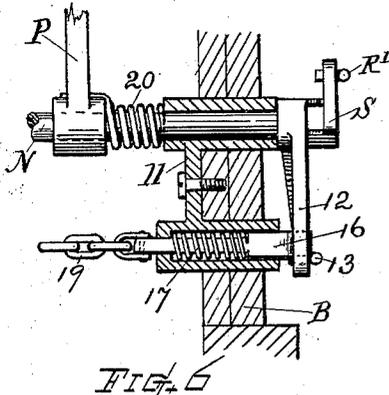


FIG. 8

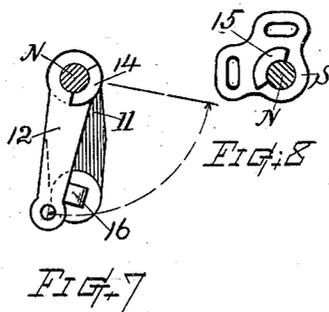


FIG. 9

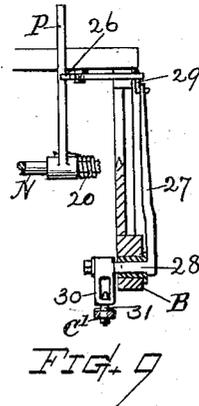


FIG. 10

Witnesses.
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UNITED STATES PATENT OFFICE.

THEOPHILUS BROWN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO RICHARDSON MANUFACTURING COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MANURE-SPREADER.

SPECIFICATION forming part of Letters Patent No. 731,539, dated June 23, 1903.

Application filed March 2, 1903. Serial No. 145,821. (No model.)

To all whom it may concern:

Be it known that I, THEOPHILUS BROWN, a citizen of the United States, residing Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Manure-Spreaders, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention primarily relates to a novel construction and arrangement for the end-gate or barrier-board which is employed at the front side of the rotary beater to keep the load from settling rearward while carting it to the field or place of spreading, and, secondly, relates to the structure and combinations of means for operating the gate or barrier-board, also to the combination of actuating mechanisms for simultaneously raising the barrier-board and for shipping the spreader-operating mechanism into active relation, as more fully hereinafter explained.

The objects of this invention are to provide a manure-spreader having a rotary beater with a barrier-board or end-gate adapted to relieve itself from the mass of the load at the initial upward movement when said board is lifted, also to provide a barrier-board adapted for foldable action, as hereinafter explained.

Another object is to provide a gate or barrier-board constructed and combined with the wagon-body, the beater, and the board-operating devices in such manner that said gate or barrier-board is adapted for performing the functions of a barrier, a comb-board, and a wind-break in relation to the beater.

Another object is to provide an elevatable foldable barrier-board with means for restraining the lower edge thereof to move in a determined line of elevation and descent, while the central portion of said board is permitted flexure from such determined line.

Another object is to provide, in a manure-spreader having a movable bottom, a rotary beater, and means for putting said bottom and beater into and out of operation, a barrier-board or gate and mechanism adapted for simultaneously by a single lever or ac-

tuating means lifting the barrier-board and throwing into action the mechanisms that operate the movable bottom and the rotary beater.

Another object is to provide a barrier-board-elevating mechanism operative in connection with the shipper mechanisms that control the beater and bed-driving gearing and means for effecting, when desired, the retention of the barrier-elevating mechanism with the board at elevated position while the said shipper mechanism is shifted for throwing out of action the bed and beater operating devices.

I attain these objects by the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 represents a side view of a manure-spreader cart or wagon and mechanism embodying my invention. Fig. 1^a illustrates the position of the hand-lever and connected parts when the bed and beater driving mechanism is out of action. Fig. 2 represents a plan view of the same. Fig. 3 is a vertical longitudinal section of the rear portion of the wagon and mechanism therein. Fig. 4 is a fragmentary vertical transverse section showing a manner of combining the end of the barrier-board with the side of the wagon-body. Fig. 5 represents a front view of the mechanism at the forward end of the body. Fig. 6 represents a sectional detail view, on larger scale, of the shaft-bearing and arm-retaining latch. Fig. 7 is an end view of the same with the outer crank member removed. Fig. 8 represents the inner side of said outer crank member. Fig. 9 is a fragmentary view showing in front elevation the detail of the automatic trip mechanism, and Fig. 10 is a fragmentary horizontal section illustrating a way of forming a groove or guide means for the restricted movement of the lower part of the barrier-board.

Referring to the drawings, the letter A indicates the rotatable main axle; B, the body or box for containing the load; C, the movable floor or bottom of the wagon, which, in connection with chains C', is mounted as a traveling bed on suitable sprocket-wheels D and D' for operation in well-known manner, movement being imparted thereto by the

worm-wheel E and disengageable worm-screw F, which latter receives motion from the axle A through suitably-arranged gearing—as, for example, the gears at G and G'.

5 I denotes the rotatable beater consisting of a cylinder or series of bars armed with projecting spikes or teeth. Rotary movement is imparted to the beater from the axle A by the gears H and H', sprocket-wheels J and J', and chain *h* or by any suitable means. A clutch K is provided for shipping the beater mechanism into and out of action. Said clutch is operated by a lever L, helical cam *m*, and connecting-rod M, that is joined to a crank member *n*, fixed upon the transverse rocker-shaft N, mounted in bearings on the forward part of the wagon-body and provided at a suitable position thereon with the hand-lever P, all of which parts have been heretofore employed.

The worm-screw F is moved from and into engagement with the worm-wheel E by a suitable lifter or shifting device R, controlled by a rod R', having its fore end connected with an arm or crank member S, fixed on the rock-shaft N. The connection devices are preferably arranged for shipping the beater-operating mechanism and the bed-operating mechanism into and out of action together with each other.

My improved barrier-board (indicated by the numeral 3) is arranged adjacent to and in front of the beater I and is adapted to be elevated to the position shown in Fig. 1 or dropped to the position shown in Figs. 2, 3, and 4. Said barrier is, in accordance with my invention, formed of upper and lower board-sections hinged together, as at 4, for flexing in the direction shown. The upper section 3^a is rigidly attached to angle-shaped arms 5, that are fulcrumed or journaled in bearings 6, respectively, supported on the sides of the wagon-body, and each journal is provided with an outside arm or crank 7 for the operating connection, the angle-arm, its journal and outside crank member together forming a rocking lever for raising and lowering the barrier-board as required. The barrier-board extends across the interior space of the wagon-body above the movable bed and is fitted to move free between the upright side walls thereof. The lower part of the lower section 3^b is restricted by suitable guides to move up and down in a determined line as the barrier is raised or depressed, while the hinge-line and upper section is unrestricted except by the movement by the swinging angle-shaped arms. The restriction of the line of movement of the lower barrier is best effected by means of guideways or grooves 9, formed in or upon the side walls of the wagon-body, and engaging lugs, pins, or rolls 8, arranged on the barrier-board at or near the lower corners thereof and which are loosely confined to run within said guideways. (See Figs. 2, 4, and 10.) The guideways or grooves 9 are disposed in vertical or approximately up-

right relation and are preferably widened or expanded rearward near their upper ends, as at 10, so that when elevated the lower edge of the barrier-board can swing rearward and perform the functions of a comb-board in combination with the beater I to facilitate the pulverizing of lumps of manure as they are thrown up by the beater or to serve as a wind-brake above the beater when spreading light fine fertilizers.

The barrier-board is shown as elevated in Fig. 1 and at its depressed or barrier position in Figs. 3 and 4. The raising and lowering of the barrier-board is effected by the swing of the arms 5, and as the upper section 3^a of the barrier is attached to said arms, the angles of which are rigid, the hinging 4 or joint-line moves on a circle the center of which is the center of the arm-journals. Hence when lifted the initial movement causes the center or folding-line of the barrier to recede somewhat rearward, thus easing the barrier away from the mass of the load and rendering the lifting of the barrier much easier than it otherwise would be. The restriction of the lower edge of the board to a determined line of movement prevents interference of the barrier with the beater and retains the load in proper position until the barrier is elevated. It also causes the foot of the barrier-board to assume proper position when lowered to the bed.

The guide-groove 9 may be formed as a recess within the side of the body, or in other instances may be formed by flange-bars 9', affixed to the upright side of the body, as indicated in section Fig. 10.

At each side of the body there is arranged upon the rocker-shaft N an arm 12, which is connected by a rod 13 to the arm 7 of the barrier-lifting rocker. A spring *x* may be connected to the arm 7 and strained from a suitable attaching device fixed on the body-frame for the purpose of counterbalancing some of the weight of the barrier-board and rendering the operation thereof somewhat easier than when such spring is omitted. If desired, the connection-rods may be provided with a turnbuckle for adjusting the length thereof.

The arm 12 is mounted loose upon the shaft, and its hub is provided with a detent or lug 14, (see Fig. 7,) adapted for engagement with an oppositely-disposed detent or lug 15, formed upon the hub of the crank member S, (or *n*,) which is fixed upon the shaft. The lugs 14 and 15 are proportioned to leave space or play-room of about one-third of the circle, more or less, between their positions of engagement.

Adjacent to the shaft-supporting bearing 11 and preferably within a casting connected therewith I arrange a latch-bolt 16, provided with a spring 17, for projecting it outward to engage the arm 12 for retaining it from swinging rearward. (See Figs. 6 and 7.) The two latch-bolts at the opposite sides of the body

are connected by a chain 19 or other means whereby they can be simultaneously retracted by the attendant from his position on the seat T when it is desired to release the arms 12.

5 The hand-lever P is fixed to the shaft N. A spring 20 is combined therewith for throwing down the lever and rocking the shaft N when released from the latch.

A ratchet-wheel 23 is mounted on the end
10 of the shaft D², that unites the chain-carrying sprockets D', and a drop-pawl or catch-bar 24, pivoted on the body-frame, is adapted to engage said ratchet-wheel for locking the shaft D² and sprockets D' from rotation, and
15 thereby holding the bed from movement when the driving-worm F is out of gear. The latch-bar 24 is connected with the crank member S by a link 25, whereby said latch-bar is lifted from the ratchet-wheel when the worm F is
20 thrown into gear and dropped into engagement when the worm is thrown out of gear.

The latch 26 for holding the hand-lever P in upright position has in connection therewith an automatic throw-off mechanism of
25 improved construction, as shown. A swinging lever 27 is fulcrumed in or upon the side beam of the body-frame, as at 28. The arm of said lever which is outside of the carrying-body has its upper end suitably joined
30 by a link 29 to an arm of the latch device, while the lower arm of said lever, which is disposed at the inner side of the body-frame, as at 30, is suitably formed and arranged to be engaged and actuated by a hook or detent
35 31, attached to one of the bed extension-chains C. The forward movement of the chain as the bed C travels rearward brings the detent 31 into contact with the lower end and moves the lever 27, and the upper arm of said lever with
40 its connection retracts the latch 26. The hand-lever is then thrown down by the force of the reacting spring 20, partially rotating the shaft N and crank members fixed thereon, thereby throwing out of gear the bed-operating and
45 beater-operating mechanisms. The hook or detent 31 is adjustably attached to the chain C' and can be shifted thereon, so as to work the trip at any desired position of the bed mechanism.

50 In the operation the manure is loaded into the carrying-body B, while the follower-board 32 and movable bottom or bed C are at forward position and the foldable gate or barrier-board is down in front of the beater I, the hand-lever P and arms 12 then being at
55 positions shown in Figs. 1^a and 2. For starting the spreading operation the attendant swings the hand-lever P to upright position, (see Figs. 1 and 5,) where it is caught and held
60 by the latch 26. The resultant movement of the shaft N, arms 12, and crank members S and *n* simultaneously actuates the several connections for raising the barrier-board 3 to its folded position, as shown in Fig. 1, disengaging the latch 24 from the ratchet-wheel
65 23, shipping into gear the bed-operating worm F, and also the clutch K of the beater-operat-

ing mechanism, thus putting the whole machinery into operation. This upward swing
of the hand-lever P and shaft N also causes
70 the lugs 15 on the crank members S and *n* to act against the lugs 14 on the arms 12 and to move said arms past the latch-bolts 16, which by their spring 17 are projected at the rear of
75 the arms for resisting backward swing of said arms. As the bottom C moves rearward the under run of the chain C' is drawn forward until the hook or detent 31 engages the end
80 30 of the trip-lever 27, causing said lever and its connections to draw back the latch 26, releasing the lever P, which latter is instantly thrown forward by the force of the spring 20, rocking the shaft N and by the several connecting means throwing out of gear the beater-
85 operating and bed-operating mechanisms. The arms 12 being retained by the latch-bolts 16 and there being sufficient space between the lugs 14 and 15, the barrier-operating connections are not at the same time released; but the barrier-board is held elevated until
90 the attendant, by a pull on the chain 19, retracts the latch-bolts 16 and releases the arms 12. Then the barrier descends to its standing position. If desired, the barrier-board can be let fall simultaneously with the trip-lever
95 action by previously withdrawing the latch-bolts 16 and keeping them retracted while the trip devices act.

The retaining of the barrier-board elevated after the trip action permits of the movable
100 bottom C being returned to its primal position before the dropping of the barrier-board. This return movement of the bottom is performed in usual manner by a crank or wrench applied to the end of the shaft which carries
105 the sprockets D'.

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

1. In a manure-spreader, in combination with the carrying-body, its movable bottom
110 and the rotatable beater; of a foldable barrier-board comprising a plurality of board-sections hinged together horizontally, and means for supporting and lifting said barrier-board, comprising swinging arms journaled
115 in bearings on the sides of the body and attached to the upper section of said foldable barrier-board, for the purpose set forth.

2. In a manure-spreader, the combination with the wagon-body, the movable bottom and
120 the rotatable beater; of a foldable barrier-board composed of horizontally-hinged sections, and a lifting and depressing means for supporting said barrier-board, substantially as described.

3. In a manure-spreader, the combination with the carrying-body and rotatable beater; of a movable folding end-board barrier, and means for adjusting or shifting said board into its several positions of use.
125

4. The combination with the carrying-body; of a folding barrier-board consisting of sections hinged together for horizontal flexure; means for restricting the lower edge of said
130

barrier to move in a determined approximately upright line, swinging arms fulcrumed upon the sides of said body and attached to the upper section of said barrier-board, and
 5 means for operating said swinging arms for raising and lowering the barrier.

5. The combination, with the carrying-body provided with approximately upright guideways on the sides thereof; of a folding barrier-board loosely fitting between said sides,
 10 said board provided at its lower part with projections that engage said guideways, rocking devices fulcrumed on the body-frame and having arms that are rigidly attached to the
 15 upper fold-section of said barrier-board, and means for controlling said rocking devices or arms to bring the barrier-board to its elevated or depressed position, for the purposes set forth.

20 6. In a manure-spreader, in combination with the movable bed, the rotatable beater, and the carrying-body having guideways on the sides thereof forward of said beater; of a
 25 folding barrier-board composed of horizontally-hinged sections loosely fitting between the sides of the body, the lower corners of said barrier-board provided with detents that engage said guideways, means for lifting said
 30 barrier attached to its upper section by rigid angular arms that are pivotally supported in a plane at or nearly in line with the top edge thereof.

7. In combination with the body, rotary beater mounted thereon, folding hinged barrier-board provided with projecting studs,
 35 and barrier-lifting mechanism therefor; the upright guideways having the upper portion thereof rearwardly enlarged to permit rearward swing of the lower barrier-board section
 40 when the barrier-board is at elevated position.

8. The combination, with the carrying-body having restricting guideways at the sides thereof, the foldable barrier-board, means whereby its lower corners are restricted to
 45 move in the line of said guideways, barrier-actuating rockers journaled in bearings on the respective sides of the body, each rocker having a rigid angle-arm secured to the top section of said barrier-board, and a rigid
 50 crank-arm at the opposite end of the journal, a hand-lever and shaft at the front of the body, arms mounted on said shaft, and rods connecting said arms with the crank-arms of said barrier-actuating rockers, for the purpose set
 55 forth.

9. In a manure-spreader, the combination with the movable bed, bed-operating mech-

anism, means for shipping said mechanism into and out of action, the rotatable beater, beater-operating mechanism, means for shipping
 60 said beater-operating mechanism into and out of action, a barrier-board, and means for raising and depressing said barrier-board; of a transversely-disposed rock-shaft supported in bearings at the front of the body
 65 and having crank members and arms mounted upon its respective ends, a hand-lever fixed on said rock-shaft, connection-rods joining said rock-shaft arms with the arms of the barrier-raising means, and connection-rods
 70 joining said rock-shaft crank members, respectively, to the shipper devices of the beater-operating mechanism and the bed-operating mechanism for simultaneous operation thereof, substantially as set forth. 75

10. The combination, with the bed, bed-operating mechanism, beater, beater-operating mechanism and barrier-board; of the hand-lever, the shaft operated thereby, crank members fixed on said shaft, means connected
 80 with said crank members for respectively throwing the bed-operating and beater-operating mechanisms into and out of action, arms loosely mounted on said shaft with connections for operating the barrier-board, interengaging lugs or detents on said crank members
 85 and arms, spring-pressed latch devices that automatically engage in rear of said arms, and means for retracting said latch devices, for the purposes set forth. 90

11. In a manure-spreader, the combination with the rotatable beater, movable bottom and its extension-chains, mechanism for operating said beater and movable bottom, and shipping means for throwing said operating
 95 mechanisms into and out of gear; of a rock-shaft, connections between said rock-shaft and the shipping means, a hand-lever and a reacting spring for moving said rock-shaft, a lever-retaining latch, a trip-lever fulcrumed
 100 in the body-frame and having its upper arm connected with said latch, and a hook or detent secured upon the extension-chain and moved thereby into contact with the lower arm of said trip-lever for effecting the retraction
 105 of said lever-retaining latch and the automatic stopping of the operating mechanism, substantially as described.

Witness my hand this 25th day of February, 1903.

THEOPHILUS BROWN.

Witnesses:

CHAS. H. BURLEIGH,
 SIMON E. KING.