No. 793,882. PATENTED JULY 4, 1905.

# LE GRAND KNIFFEN.

# MANURE SPREADER.

APPLICATION FILED DEC. 10, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

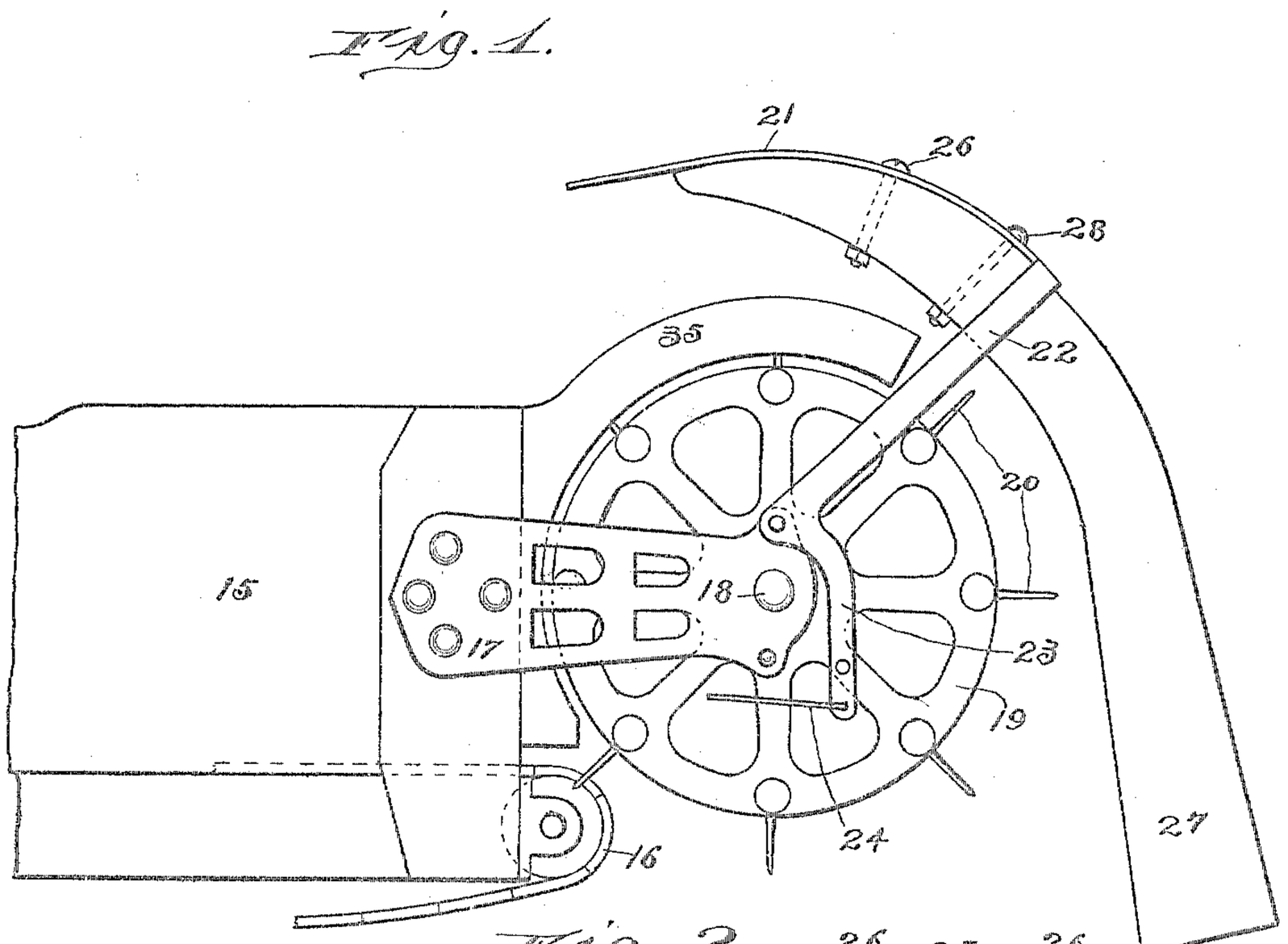
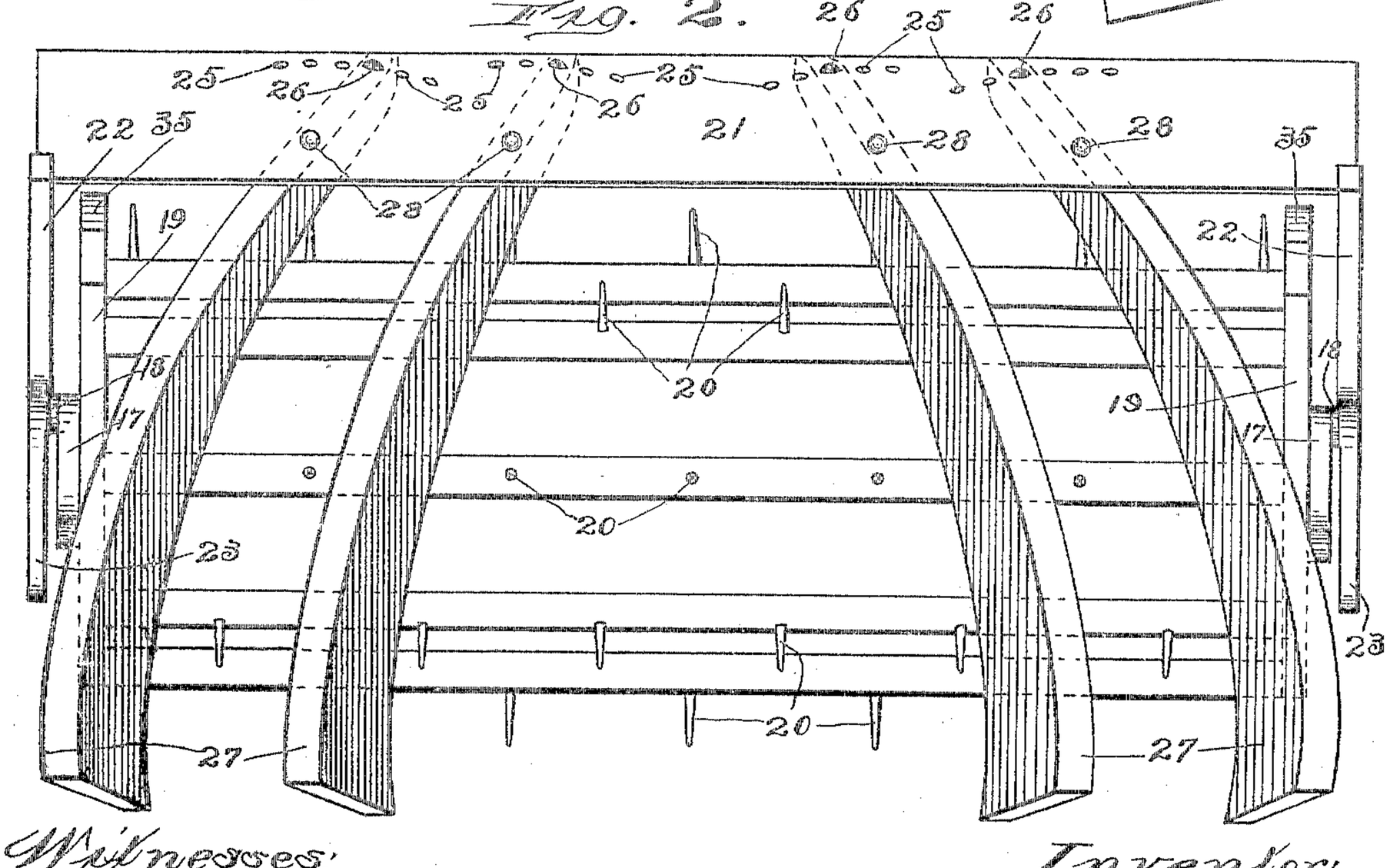



Fig. 2.

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No. 793,882. PATENTED JULY 4, 1905.

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## MANURE SPREADER.

APPLICATION FILED DEC. 10, 1904.

3 SHEETS—SHEET 2.

Fig. 3.

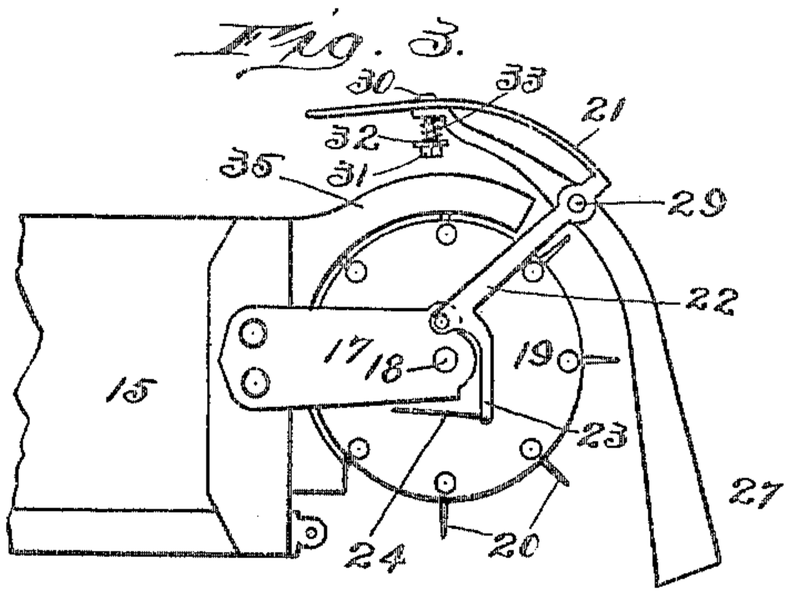


Fig. 4.

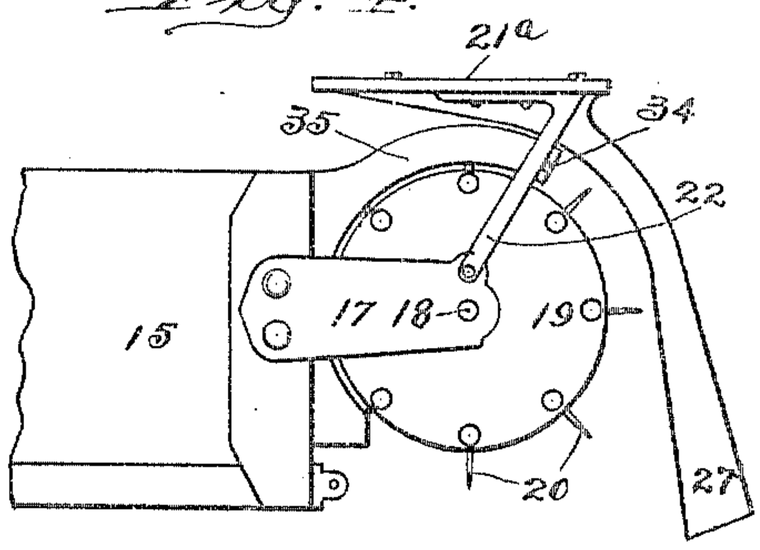


Fig. 5.

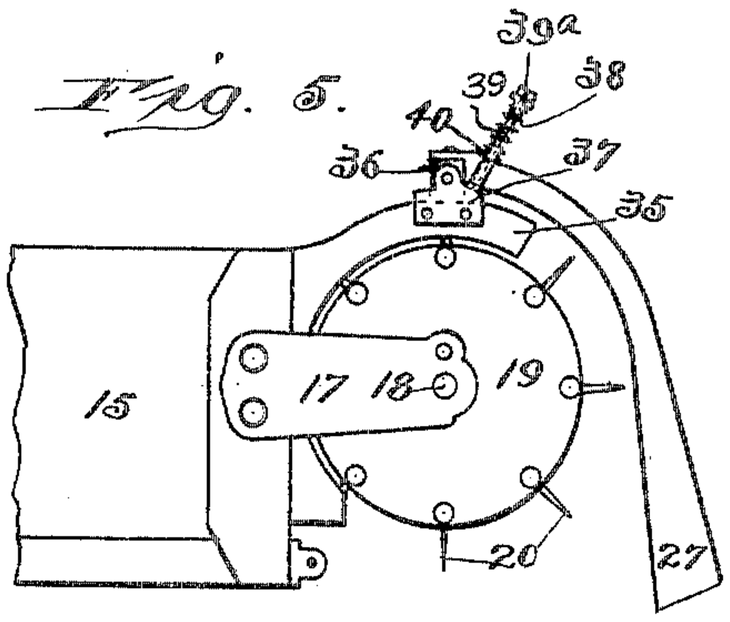


Fig. 6.

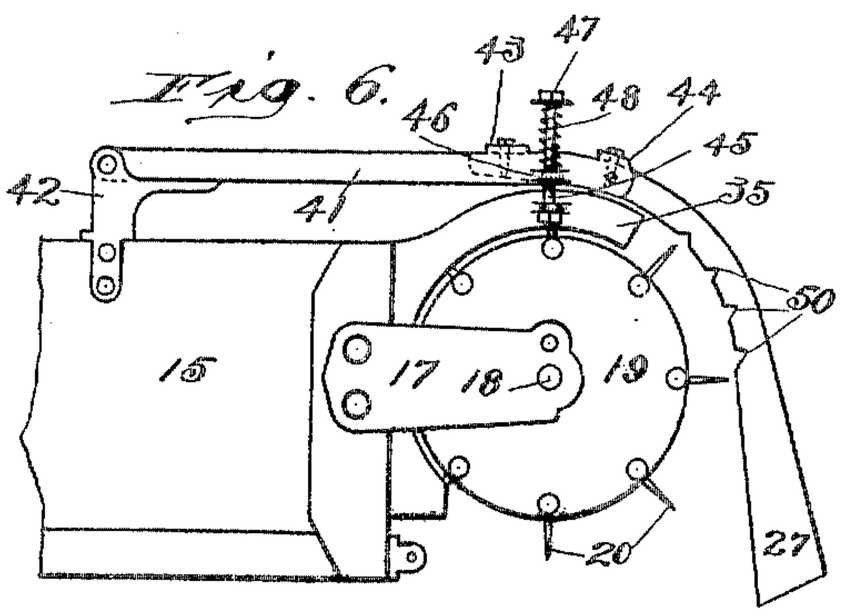


Fig. 7.

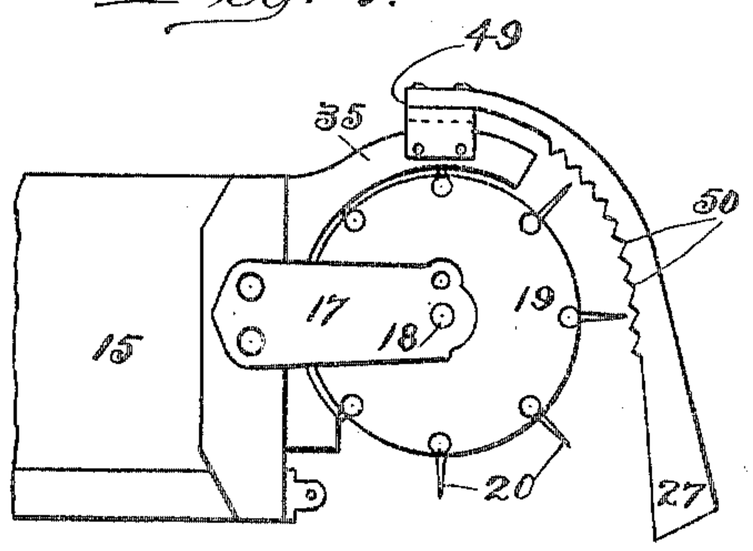


Fig. 8.

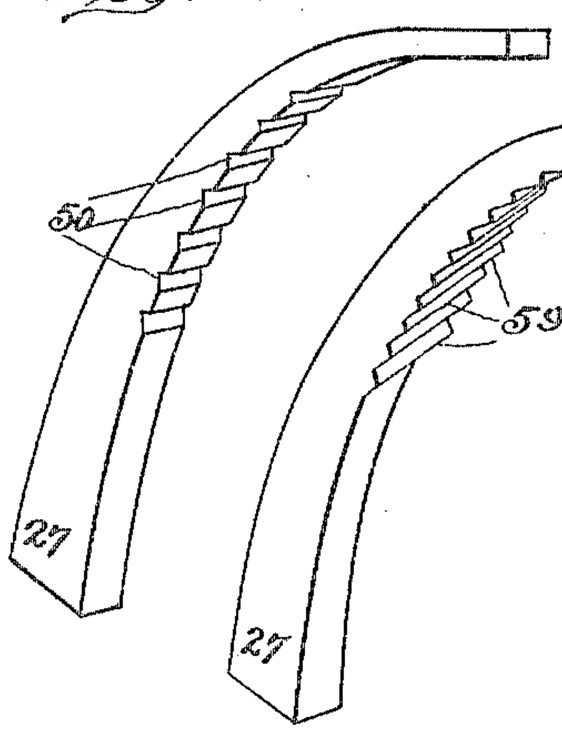


Fig. 9.




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No. 793,862. PATENTED JULY 4, 1905.

# LE GRAND KNIFFEN.

## MANURE SPREADER.

APPLICATION FILED DEC. 10, 1904.

3 SHEETS—SHEET 3.

Fig. 10.

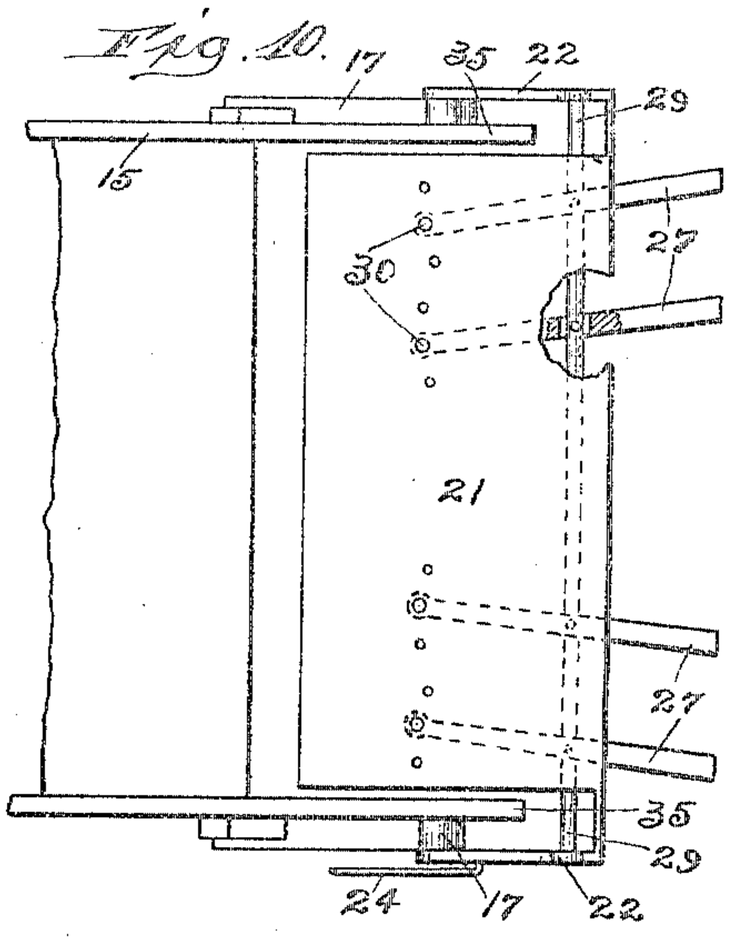


Fig. 11.

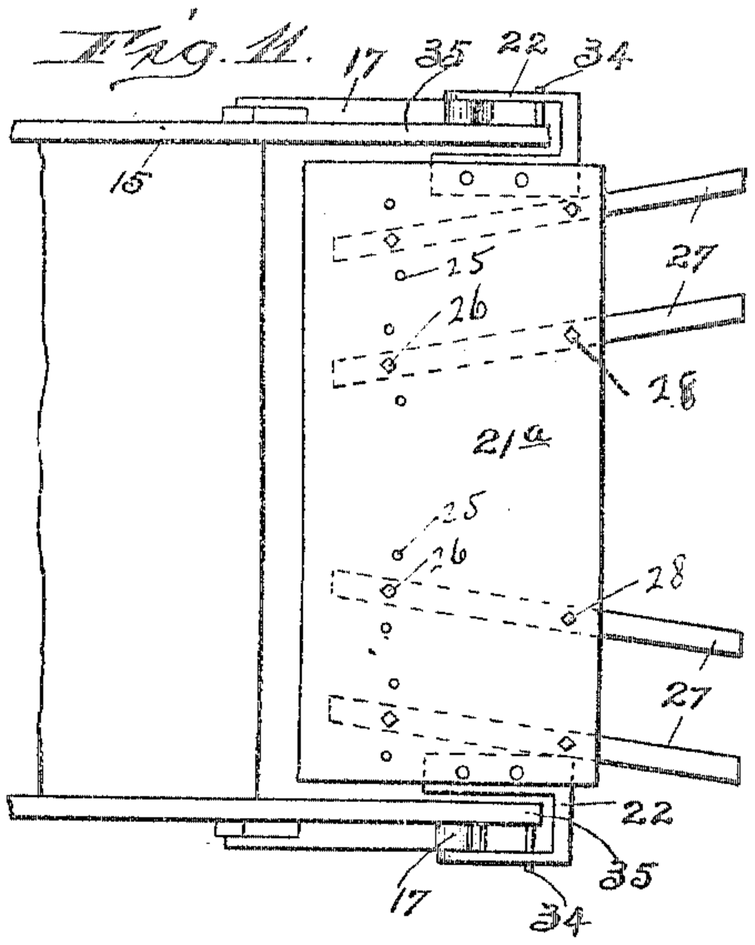


Fig. 12.

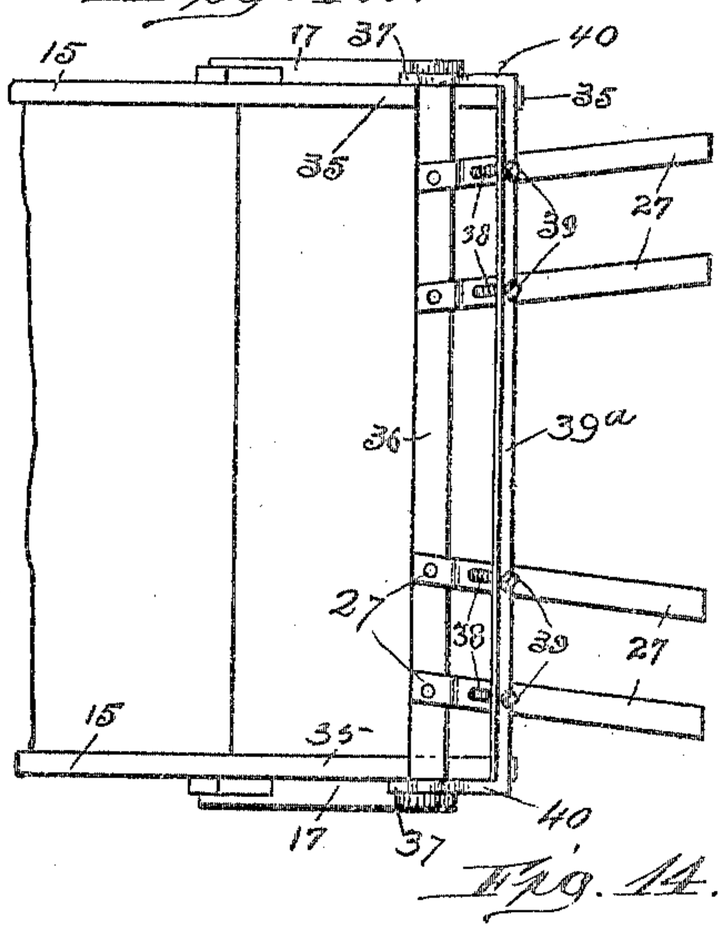


Fig. 13.

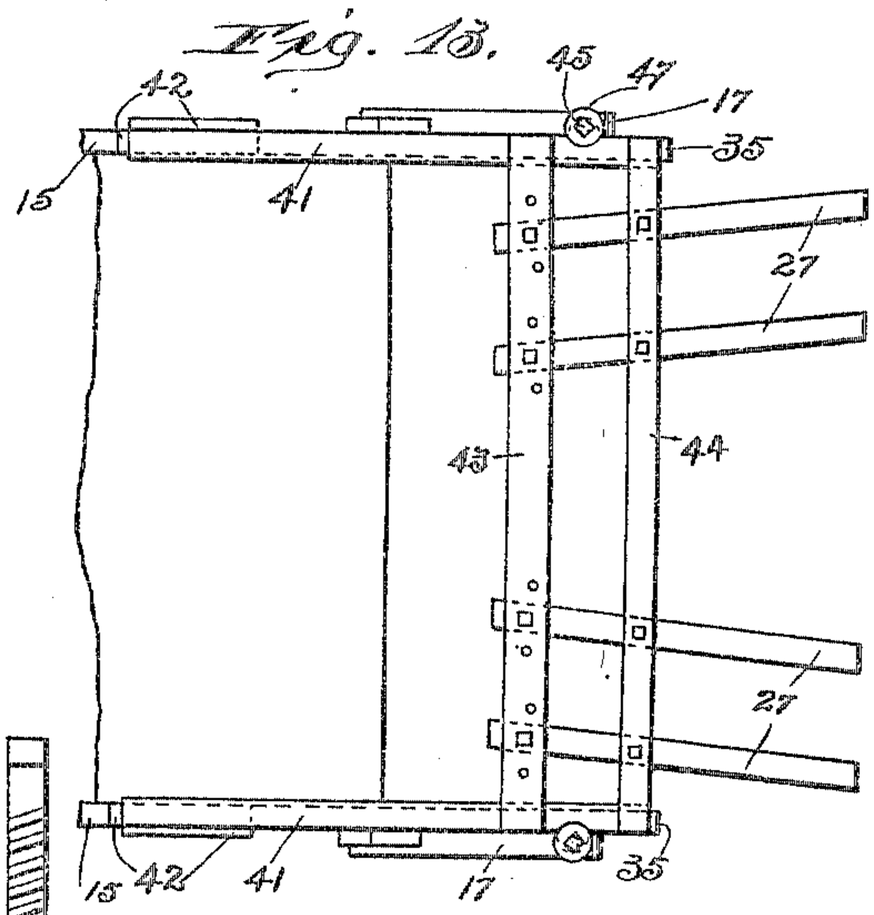


Fig. 14.


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No. 793,882. Patented July 4, 1905.

# UNITED STATES PATENT OFFICE.

LE GRAND KNIFFEN, OF CHICAGO, ILLINOIS.

## MANURE-SPREADER.

SPECIFICATION forming part of Letters Patent No. 793,882, dated July 4, 1905.

Application filed December 10, 1904. Serial No. 236,305.

*To all whom it may concern:*

Be it known that I, LE GRAND KNIFFEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Manure-Spreaders, of which the following is a specification.

This invention relates to improvements in that type of manure-spreaders or fertilizer-distributers in which a movable conveyer is employed at the bottom of the box or body to convey the fertilizing material rearwardly therein and a rotary beater provided with teeth or spikes is used at the rear end of the body to discharge and scatter the load; and it has especial relation to certain improvements which may be applied to the various kinds of spreaders or distributers of the above-named type whereby the manure or fertilizer will be spread over a wider space than the width of the body or the length of the beater and in being so spread will be prevented from being carried or blown by the wind to one side of the machine as it is raised by the beater and will be thoroughly pulverized or disintegrated in the discharging or spreading operation.

The above-named results are accomplished by the employment of a retarding and deflecting device, which is mounted on the rear portion of the machine in close proximity to the beater, so as to partially surround the same in order to coact therewith.

The invention consists in certain novel features of the construction and combinations and arrangements of the several parts, as will be hereinafter more fully set forth and specifically claimed, and in order to enable others skilled in the art to which my invention pertains to make and use the same I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in side elevation of the rear portion of the body of a manure-spreader, showing one form of my invention applied thereto. Fig. 2 is an enlarged rear end view in elevation of like parts. Figs. 3 to 7, inclusive, are side views in elevation of the rear portion of the body of the manure-spreader, showing modified forms of the invention applied thereto. Figs. 8 and 9 are detached perspective views of the deflectors, showing modifications in the construction thereof. Figs. 10, 11, 12, and 13 are plan views of the rear portion of the body of the manure-spreader, showing the constructions and arrangements of the parts illustrated in Figs. 3, 4, 5, and 6, respectively; and Fig. 14 is a face view of the deflector shown in Fig. 9.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

The reference-numeral 15 indicates the box or body of the machine, which is mounted, as usual, on the ordinary running-gear (not shown) of a wagon and has at its bottom a rearwardly-traveling conveyer 16, employed for carrying the manure or fertilizer rearwardly within the body. Horizontally journaled at the rear end of the body and usually on brackets 17, secured to each side thereof, is a shaft 18, on which is mounted a cylindrical beater 19, which is provided with spikes or teeth 20 to engage the manure or fertilizer, so as to discharge it from the body. This beater, as well as the conveyer 16, may be driven by any desired or well-known means. Located horizontally above the beater 19 is a shield 21, which is supported at each of its ends by means of an arm 22, which are pivotally secured at their lower ends and preferably to the brackets 17 on the sides of the body. Each of these arms may have a downward extension or crank 23, to one or both of which one end of a rod 24 is secured, which rod extends to the front portion of the body and may be used for raising and lowering the shield or for adjusting its position, as well as for holding it against rearward movement. This shield is provided in its rear portion with a series of openings 25, to be used for the reception of pins or screws 26, employed to adjustably secure the deflectors 27 thereto.

As shown in Figs. 1 and 2 of the drawings, the shield as well as the deflectors are curved, and the latter are pivotally secured to the former near their upper ends on pivot-bolts 28, so that by removing the pins 26 the deflectors 27 may be turned laterally on their pivots until the proper inclination is attained,

in which positions they may be retained by inserting the pins 26 in the proper openings 25 in the shield. In the drawings I have shown the shield equipped with four deflectors arranged in pairs, and illustrated one pair as being diagonally inclined toward the right and the other similarly inclined toward the left end of the beater; but I do not desire to be limited to the use of such a number of deflectors, as I may employ any desired number without departing from the spirit of my invention.

In Fig. 3 of the drawings I have shown a modification in the manner of connecting the deflectors 27 to the shield 21, which consists in uniting the arms 22, which support the shield 21, by means of a transverse rod 29, on which the deflectors 27 are loosely pivoted near their upper ends at proper distances apart. In this modification the upper ends of the deflectors 27 are yieldingly secured to the lower surface of the shield 21 by means of bolts 30, which pass through openings in the upper ends of the deflectors, and each bolt has on its lower end a nut 31 and a washer 32, between which washer and the lower surface of the upper end of the deflector is located a spring 33 to normally press said end against the lower surface of the shield, yet to permit of it being depressed when the lower portion of the deflector is thrown outwardly from the beater, which arrangement will be found advantageous in permitting stones or unbreakable substances to pass, which the manure or fertilizer may contain.

In Figs. 1 to 3, inclusive, and as above set forth I have shown the shield curved and the deflectors adjustably secured thereto, in both instances adjustable laterally and in Fig. 3 yieldingly movable vertically; but as I do not desire to be limited to said constructions I have shown in Figs. 4 and 11 of the drawings another modification, which consists in employing a flat shield $21^a$, which is supported horizontally above the beater on arms 22, which arms may be prevented from rearward movement by means of pins 34 on the rear ends of the extensions 35 of the body. In the present modification the deflectors 27 are secured to the lower surface of the shield $21^a$ by means of pivot-pins 28 and at their upper ends by means of pins 26, which are inserted through openings 25 in the said shield.

In Figs. 5 and 12 is shown another modification, which consists in dispensing with the shield and its supporting-arms and in employing a transverse bar 36, which is journaled at each of its ends on brackets 37, secured to the extensions 35 of the body. To this bar the upper ends of the deflectors 27 are secured at proper distances apart and are pressed downward by means of springs 38, which encircle downwardly-extending rods 39, which are secured at their upper ends to a cross-bar $39^a$, which is supported at its ends on an upwardly-extending arm 40, with which each of the brackets 37 is provided and which may be integral therewith. In the construction now under consideration it is evident that if stones or other unbreakable articles are carried over by the beater the deflectors 27 will yield sufficiently to allow said articles to pass.

In Fig. 6 is shown another modification, which consists in employing a frame comprising two side pieces 41, which extend longitudinally with the sides of the body. The front end of each of the side pieces 41 is pivotally secured to the upper portion of a bracket 42, secured to each of the sides of the body in front of the beater. The rear portions of the pieces 41 are united by means of cross-bars 43 and 44, to which the deflectors 27 are adjustably secured at their upper ends. In this construction each of the extensions 35 is provided with an upwardly-extending rod 45, which pass through apertured lugs 46 on the side pieces 41 and have on their upper ends an enlargement 47, between which and the lugs 46 is located a spring 48, which surrounds each of said rods and presses the deflector-frame downwardly.

In Fig. 7 is shown a further modification, in which a cross-bar 49, which extends from one of the extensions 35 to the other, is employed to support the deflectors 27, which are rigidly secured thereto at their upper ends, but in such a manner as to have the proper lateral inclination. In this modification, as well as that shown in Fig. 6 of the drawings, the lower surface of each of the deflectors 27 is formed or provided with teeth or serrations 50 to aid in retarding the manure or fertilizer, and thereby causing it to be more thoroughly pulverized or picked to pieces by means of the teeth of the beater.

In Figs. 8 and 9 are shown two of the deflectors having their lower surfaces serrated, and it will be observed that in the construction illustrated in Fig. 8 the serrations 50 extend horizontally across the deflector, while in the construction shown in Figs. 9 and 14 they extend diagonally thereon and project from its surface.

From the foregoing and by reference to the drawings it will be understood and clearly seen that as the manure or fertilizer is discharged from the body by means of the revolving beater, which will throw it upwardly and rearwardly, the shield will retard or stop its ascent, preventing it being blown to one side by the wind and causing it to fall back on and be further subjected to the action of the beater. In the rotation of the beater the manure or fertilizer will be carried farther over thereby and will come in contact with the deflectors, which, it will be understood, may be made of pieces of metal, boards, or rods and which are in all of the constructions arranged or adapted to be arranged so as to partially surround the beater and to lie near its teeth

and diagonally with respect to its surface—that is, some of them will be inclined toward one end of the beater and others in the opposite direction. This inclination of the deflectors will cause the manure or fertilizer to be retarded in its movements and to travel sidewise, and thus be subjected to the picking or disintegrating effect of several of the beater-teeth, whereas if they were not used the lumps would pass directly over with the beater and only be subject to contact with the teeth on which they are first impaled. Besides thus causing the manure or fertilizer to be thoroughly pulverized or disintegrated, the deflectors will guide it downwardly and laterally, so that it will be spread over a space wider than the body or length of the beater. It is therefore apparent that the deflectors are used not only for spreading the manure or fertilizer, but also for retarding it and deflecting its course of travel, so as to give several of the teeth of the beater an opportunity to pick at or act on the lumps, so as to effect thorough pulverization of the load, and to aid in this the lower surfaces of the deflectors are sometimes serrated.

In Letters Patent No. 687,935, issued to me on the 3d day of December, 1901, I have shown a depending apron provided with ribs located at a distance below the beater to guide the manure so that it will be deposited in rows and am aware that, broadly, it is old to use adjustable deflectors, and I therefore do not claim as new the broad use of the same; but

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

1. In a manure-spreader, the combination with the body, of a rotary beater journaled at its rear end, and means supported above and close to the beater whereby the manure or fertilizer will be retarded in its movements and deflected to both sides of the machine, substantially as described.

2. In a manure-spreader, the combination with the body, of means to move the load rearwardly therein, a rotary beater journaled at the rear end of the body, and a retarding and deflecting device located above and close to the beater and curved so as about to conform to an arc of the circle described by the beater-teeth whereby the manure or fertilizer will be retarded in its movements and deflected to both sides of the machine, substantially as described.

3. In a manure-spreader, the combination with the body, of a rearwardly-movable conveyer at its bottom, a rotary beater journaled at the rear end of the body, and a series of curved retarding-deflectors diagonally disposed in opposite directions above and near the beater, substantially as described.

4. In a manure-spreader, the combination with the body, of a rearwardly-movable conveyer at its bottom, a rotary beater journaled at the rear end of the body, and a series of curved retarding-deflectors adjustably secured at their upper ends and diagonally disposed in opposite directions above and near the beater, substantially as described.

5. In a manure-spreader, the combination with the body, of a rearwardly-movable conveyer at its bottom, a rotary beater journaled at the rear end of the body, and a series of retarding-deflectors curved on their lower surfaces and diagonally disposed in opposite directions above and near the beater, the lower surfaces of said deflectors having serrations, substantially as described.

6. In a manure-spreader, the combination with the body, of a rearwardly-movable conveyer at its bottom, a rotary beater journaled at the rear end of the body, a support horizontally located above the beater and movably connected to the body, and a series of retarding-deflectors adjustably connected at their upper portions to said support and diagonally disposed in opposite directions above and near the beater so as to partially surround the same, substantially as described.

7. In a manure-spreader, the combination with the body, of a rotary beater journaled at its rear end, a support horizontally located above the beater and pivotally connected to the body, and a series of retarding-deflectors curved on their lower surfaces and connected at their upper portion to said support, said deflectors being diagonally disposed in opposite directions above and near the beater, substantially as described.

8. In a manure-spreader, the combination with the body, of a rotary beater journaled at its rear end, a shield located above the beater and pivotally connected to the body, and a series of curved retarding-deflectors adjustably connected at their upper ends to the shield and diagonally disposed in opposite directions above and near the beater, substantially as described.

9. In a manure-spreader, the combination with the body, of a rotary beater journaled at its rear end, a spring-actuated support horizontally located above the beater and movably connected to the body, a series of curved retarding-deflectors connected at their upper portions to said support and diagonally disposed in opposite directions near the beater, substantially as described.

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