J. DICK.

FODDER CUTTER.

APPLICATION FILED SEPT. 4, 1908

974,776.

Patented Nov. 8, 1910

3 SHEETS—SHEET 1.

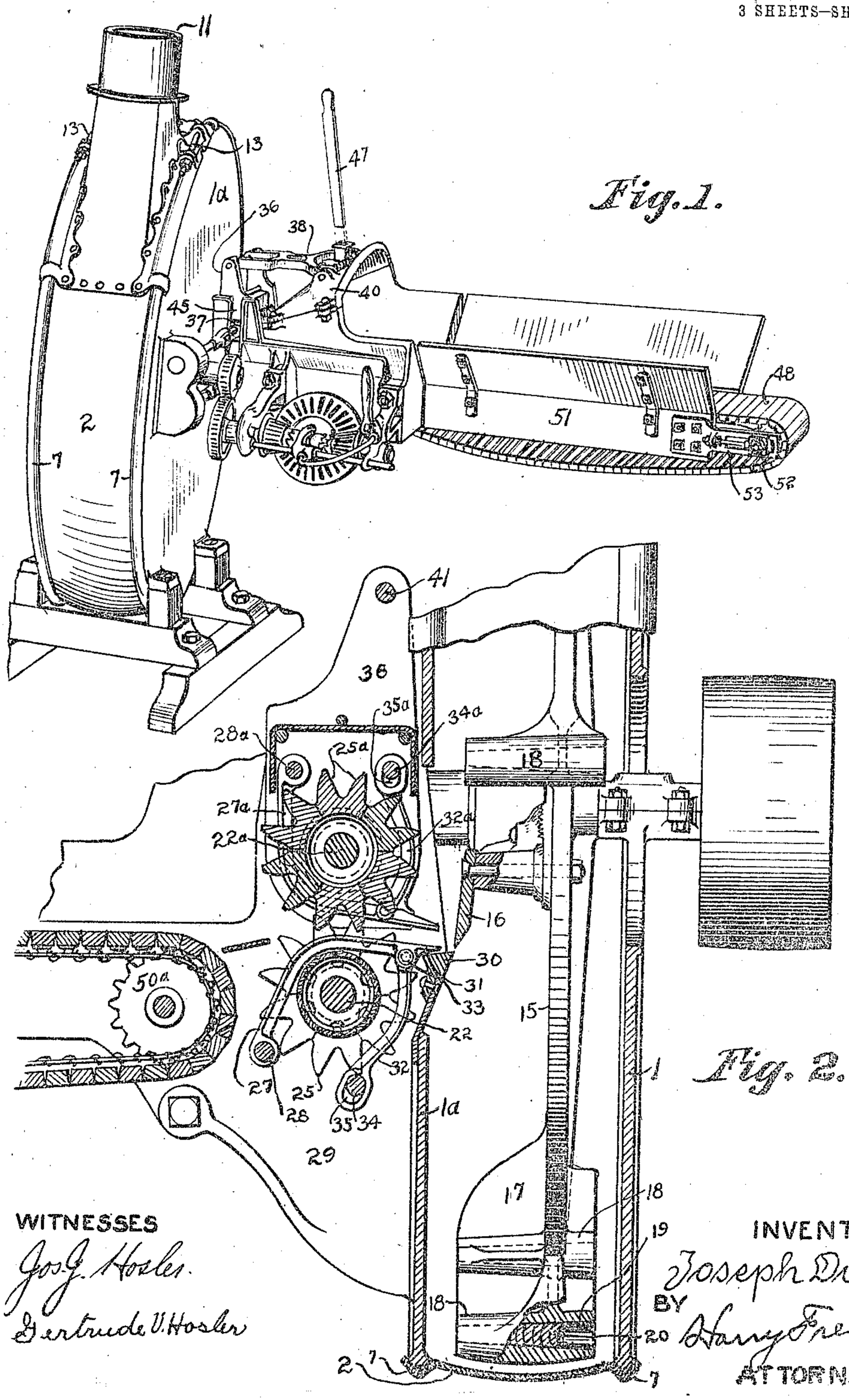

Fig. 1.

Fig. 2.

WITNESSES

Jos. J. Hosler.

Gertrude V. Hosler

INVENTOR

Joseph Dick.

BY

Harry Grease

ATTORNEY

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3 SHEETS—SHEET 2.

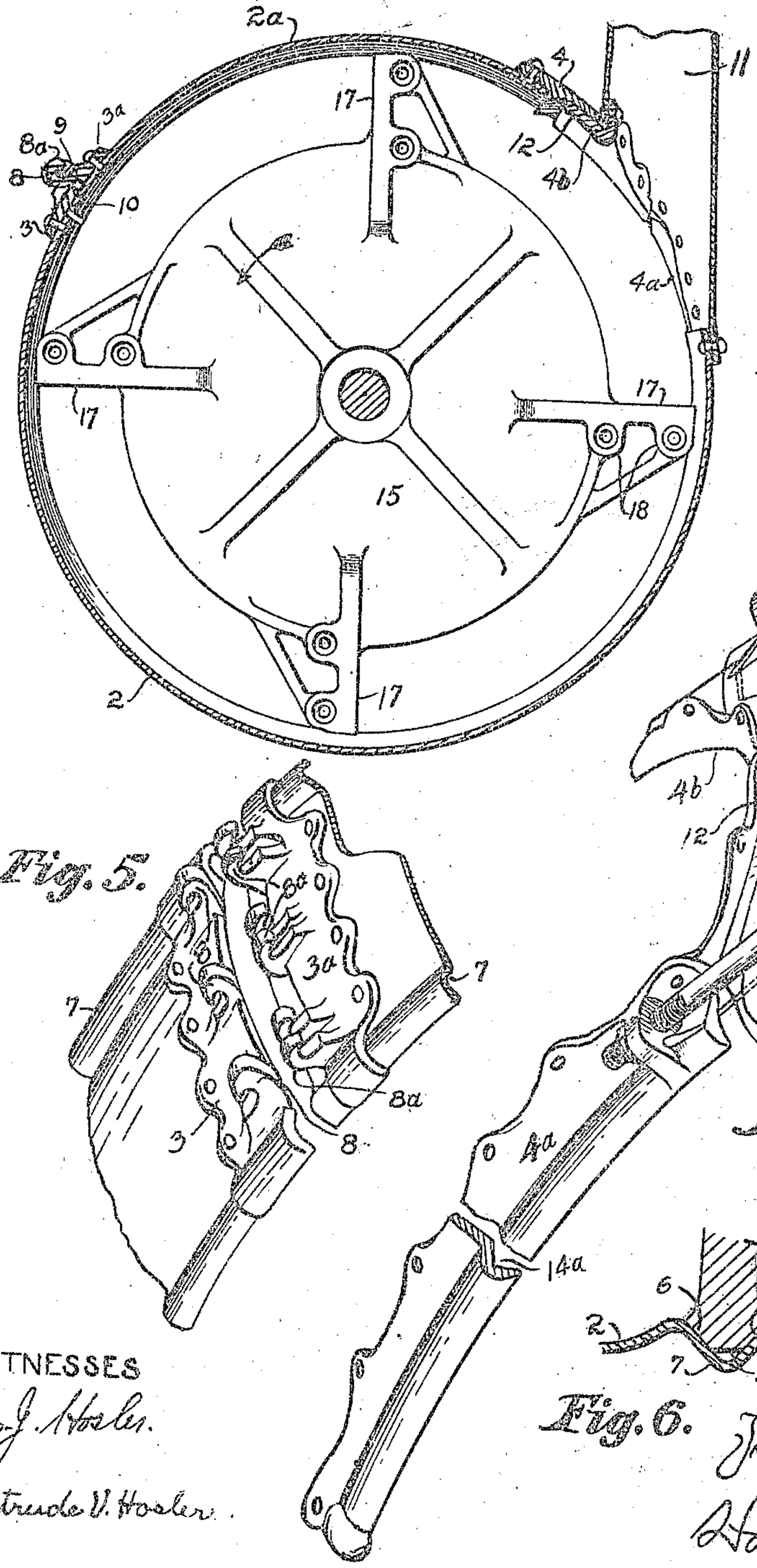

Fig. 3.

Fig. 5.

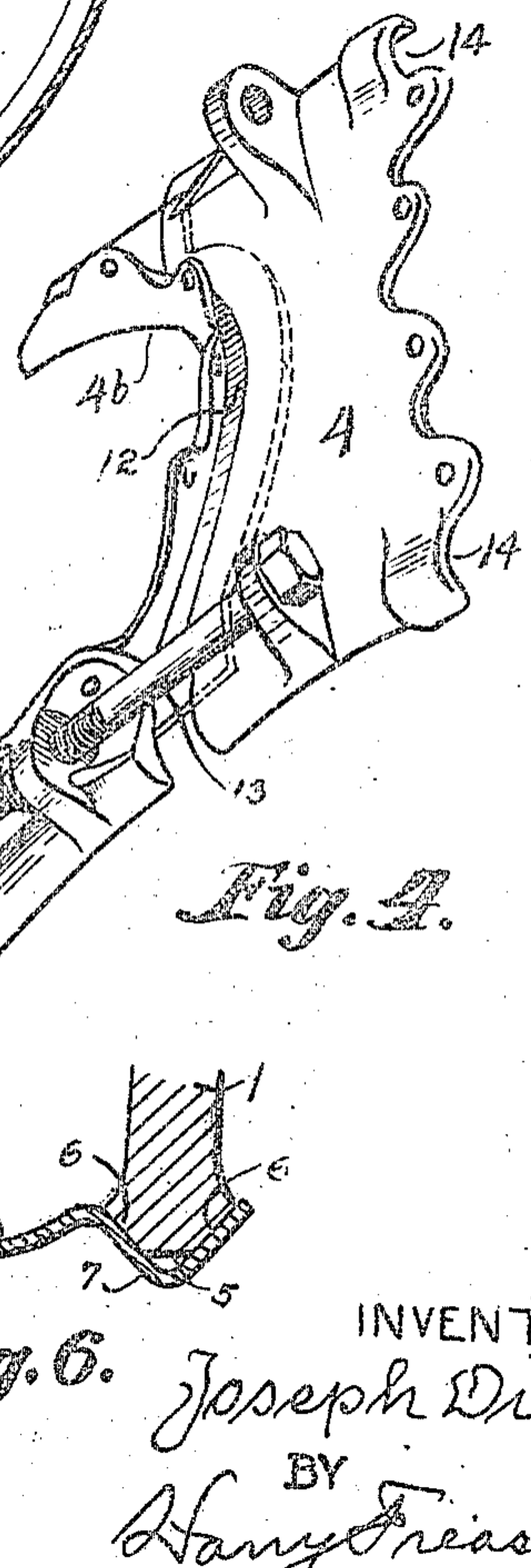

Fig. 4.

Fig. 6.

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3 SHEETS—SHEET 3.

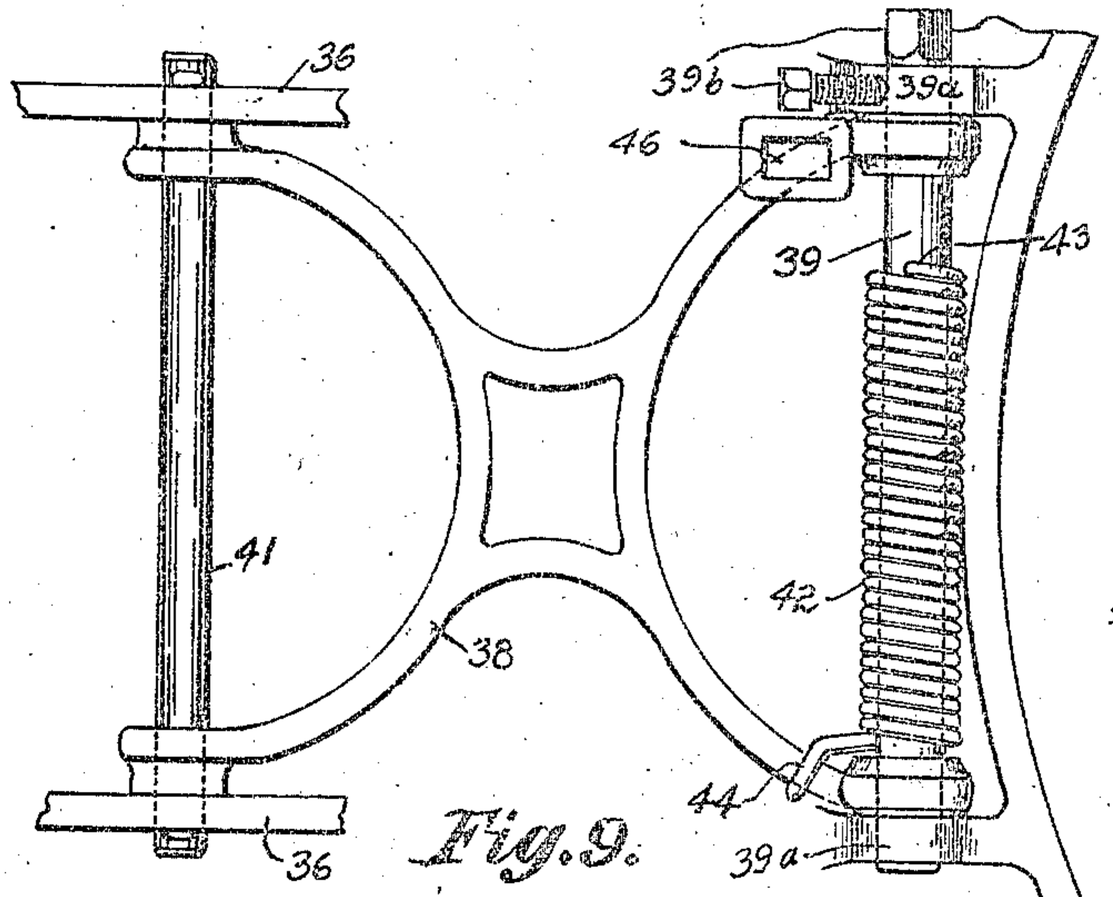

Fig. 9.

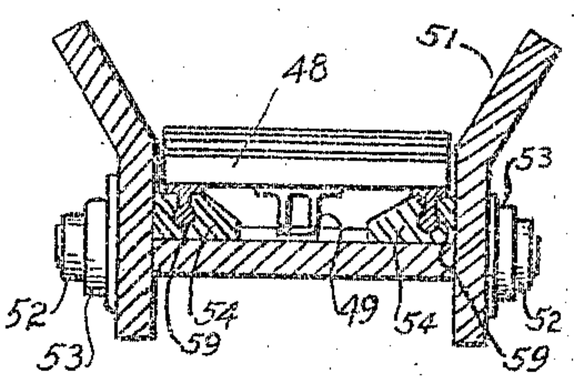

Fig. 12.

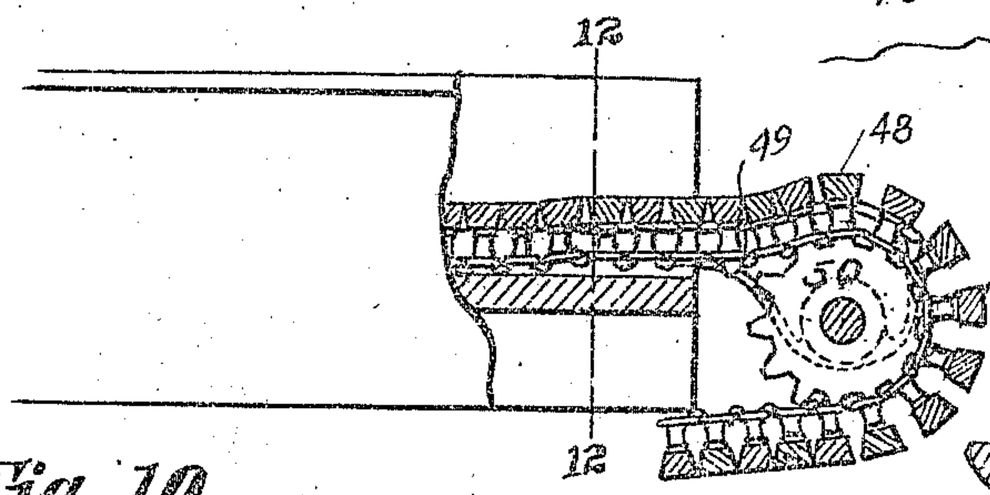

Fig. 10.

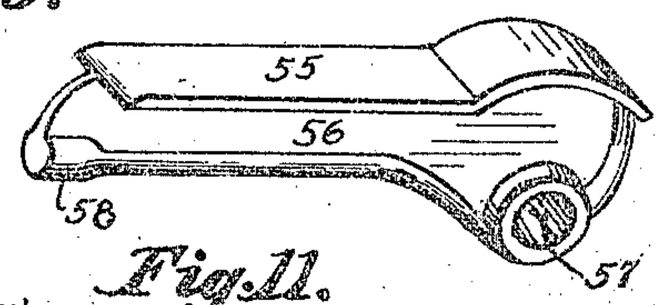

Fig. 11.

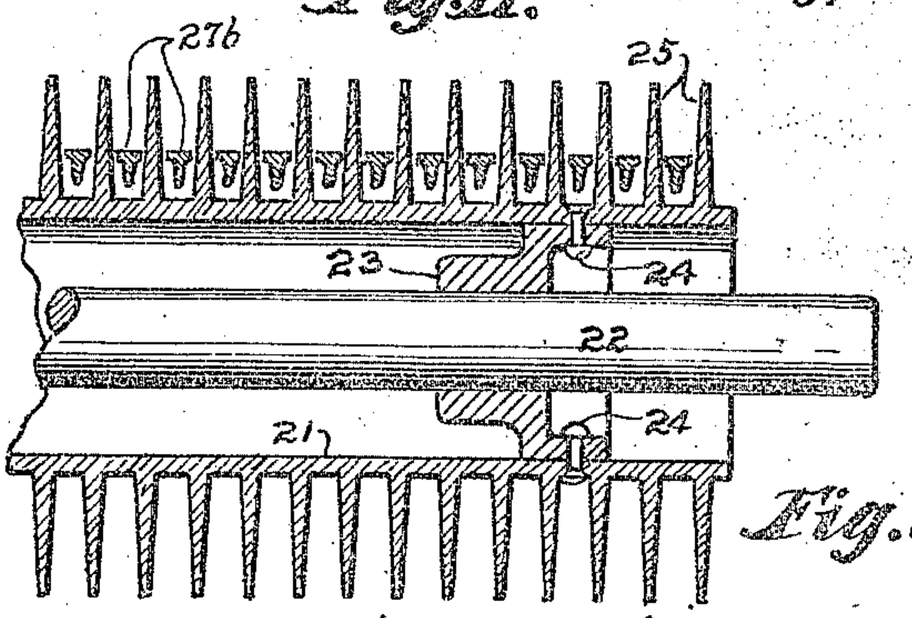

Fig. 8.

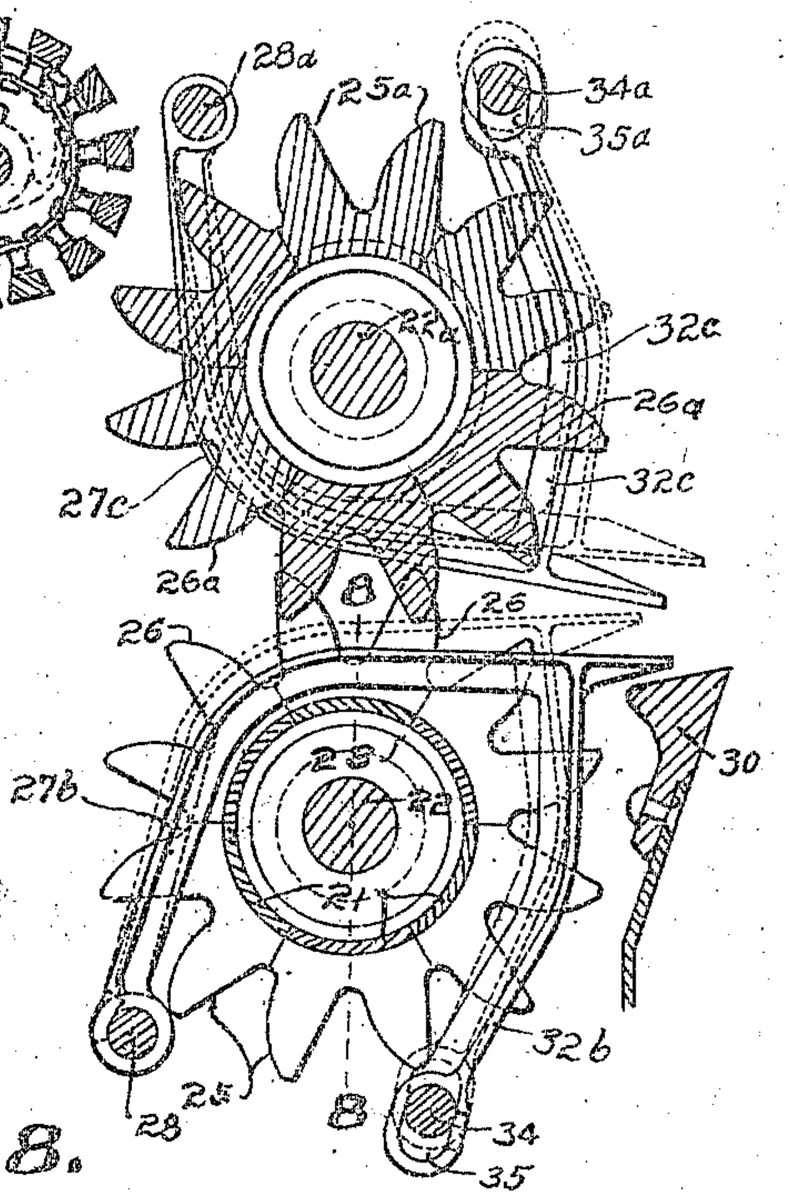

Fig. 7.

WITNESSES { Jos. J. Hosler. Gertrude V. Hosler.

INVENTOR

Joseph. Dick

BY

Harry Grosse.

ATTORNEY

UNITED STATES PATENT OFFICE.

JOSEPH DICK, OF CANTON, OHIO.

FODDER-CUTTER.

974,776. Specification of Letters Patent. Patented Nov. 8, 1910.

Application filed September 4, 1908. Serial No. 451,634.

To all whom it may concern:

Be it known that I, JOSEPH DICK, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Fodder-Cutters, of which the following is a specification.

The invention relates to machines for cutting forage; and the improvements pertain to the construction of the pneumatic blower case in which the cutting-knife and the blower-fan fly wheel is rotatably mounted, to the construction of the feed rolls, to the devices for cleaning the feed-roll teeth and for forming a throat between the feed-rolls and the cutter-bar, and to the mechanism for adjusting the upper feed roll.

A well-known construction of the blower case is to join two separate circular side plates with a series of overlapping interchangeable peripheral plates by means of adjustable peripheral rods, the inner sides of the peripheral plates being provided with grooves adapted to receive the edges of the side plates. As such separate side and peripheral plates have frequently been made of cast iron, it has been found practically impossible to construct and assemble the parts so that the joints will be tightly closed and dust-proof, which difficulty arises largely by reason of the rigidity of the respective parts, and the practical impossibility of forming or finishing the abutting parts to exactly fit each other in all positions of relative arrangement. This difficulty is overcome by making the peripheral part of the blower out of one or more sheet metal sections having annular corrugations in their edges adapted to fit over the edges of the side plates, with suitable devices whereby the sheet metal sections are clamped around the side plates, in which relation of the parts the resilience of the sheet metal permits the same to neatly fit and clamp the edges of the plates at all points irrespective of any ordinary inequalities in the finish thereof.

Fodder cutters are utilized to reduce so many kinds of forage and other materials and to do the work under such varying conditions, that it has been found desirable to make the feed rolls with a series of annular rows of teeth thereon quite close together and arranged so that the teeth of the rows on one roll will mesh between the teeth of rows on the other roll when the two rolls are brought near together. Difficulty has been experienced in providing means for cleaning the teeth of such rolls to prevent the forage from being carried around the rolls and clogging the machine; and when plates have been employed to bridge the interval between the lower roll and the cutter bar, difficulty has occurred by reason of the friction of the plates on the roll and of the clogging of the forage against the cutter bar on the sides and underneath such plates. These difficulties are overcome by providing a series of preferably adjustable cleaning fingers between the respective rows of teeth, and extending the same forward to form a throat terminating over and adjacent to the cutter bar, each cleaning finger being preferably independently supported so that it will not bear either upon the roll or upon the cutter bar.

In the larger fodder cutters, it has generally been found desirable to provide a carriage for the upper roller which will not only permit it to move upward and downward but to tilt somewhat in its lateral position to accommodate the varying thickness of the forage, but in the smaller machines, and especially when the forage is arranged in uniform bundles for feeding into the machine, and furthermore when the rolls are formed with teeth and supplemented by cleaning fingers as herein set forth, this tilting adjustment is not essential, and it is sometimes more important that the rolls shall be firmly presented to each other in parallel relation and that the upper roll can be conveniently raised from the lower roll whenever it is desired to have access to the throat of the machine. These objects are attained by suspending the upper feed roll from a spring-controlled bracket or frame and to provide a handle by which the same can be readily rotated by manual means to raise the roll.

The various objects of the invention, which are thus set forth in general terms, are attained by the construction, mechanism and arrangement illustrated in the accompanying drawings, forming part hereof, in which—

Figure 1 is a perspective view of the fodder cutter, showing the general relation of the parts; Fig. 2, a longitudinal-vertical sec-

tion of a part thereof showing the feed rolls and the lower portion of the adjacent case; Fig. 3, a vertical section of the blower case, transverse its axis; Fig. 4, a detached perspective view of the elevator pipe coupling showing only one arm of the pipe bracket; Fig. 5, a detached perspective view of the ordinary peripheral band coupling; Fig. 6, a fragmentary sectional view illustrating one peripheral edge joint of the case; Fig. 7, a detached sectional view of the feed rolls transverse their axes, showing a modified form of the throat cleaning fingers; Fig. 8, a fragmentary sectional view of one end of the lower feed roll on line 8—8, Fig. 7; Fig. 9, a plan view of the upper feed roll supporting bracket; Fig. 10, a sectional elevation of the end of the feed trough showing the bridge plate applied thereto; Fig. 11, a detached perspective view of one bridge plate; and Fig. 12, a cross section of the feed trough on line 12—12, Fig. 10.

Similar numerals refer to similar parts throughout the drawings.

The blower case is composed of the two side plates 1 and 1^a, and a sheet metal peripheral band which is preferably made in two sections 2 and 2^a joined together by the hinge brackets 3 and 3^a and the pipe brackets 4 and 4^a. The peripheral edges of the side plates are formed with the middle flat face 5 and the lateral beveled faces 6, and the edges of the peripheral band sections are curved to form the corrugations 7 which are made of such a cross section that they must be sprung or expanded to fit the beveled faces of the edges, as shown in Fig. 6; and the middle portion of the peripheral band is preferably crowned or arched outward in its cross section, to give the band as a whole some lateral as well as longitudinal elasticity, as shown in Fig. 2.

The peripheral band is preferably although not necessarily made in two sections, and the lower or main section 2 preferably embraces more than half of the lower portion of the side plates, so that when placed around the plates it will be retained thereon by the spring of the metal. These two sections are coupled together by means of the hinge brackets 3 and 3^a which are riveted to the respective adjacent ends, and the hinge bearings are preferably made in the form of the hooks 8 and 8^a which are adapted to engage over the hinge pintle 9 by means of which the peripheral sections are readily engaged and disengaged. The end 10 of the peripheral section 2^a is preferably extended beyond the hinge bracket 3^a pertaining to this part so as to underlap the hinge bracket 3 pertaining to the peripheral section 2 thereby making a tight joint between the parts at the hinge.

To the other ends of the peripheral-band sections are riveted the coupling brackets 4 and 4^a of which latter there are two arms, one being located on each side of the blower and being also riveted to the respective sides of the outlet or elevator pipe 11 leading from the blower, which pipe is also riveted to the end of the main peripheral section 2. The yoke 4^b which connects the side arms of the bracket 4^a is also riveted to the discharge pipe, and is provided with the flange 12 which underlaps the bracket 4 on the lid peripheral section, thus making a close joint therewith.

The clamping bolts 13, one on each side, connect the brackets 4 and 4^a of the pipe coupling, and when the parts are assembled these bolts are adapted to engage the ears 13^a and 13^b on the coupling brackets and to tightly clamp the peripheral band sections around the edges of the side plates. In so doing the edge corrugations of the band sections are sprung or expanded to fit and clamp the beveled edges of the plates, and the resilience of the band-sections permits them to fit tightly against the edges of the plates at all points in their peripheral edges, thereby making a neat and tight joint therewith. The pipe bracket sections are provided with the grooves 14 and 14^a the walls of which are adapted to fit over and clamp the peripheral edges of the side plates, thus completing the peripheral closure of the case; and the lapping of the band-section under the opposite hinge-section and of the yoke of one pipe bracket under the other one, tightly closes these joints, thus making a substantially dust-tight case. It is evident that the discharge pipe can be adjusted to various positions by merely loosening the clamping bolts and that the lid section can be opened up and detached by removing the bolts.

The fly wheel 15 is preferably made in the form of a solid disk. The cutting blades as 16 are secured to this wheel and the fans 17 are provided on and extended beyond the peripheries of the wheel and are preferably integral therewith, as shown. The transverse enlargements 18 are formed on the rear sides of the fans respectively at and beyond the periphery of the wheel, and in these enlargements are formed the preferably tapered holes 19 in which additional counterbalancing weights, preferably the sheets of lead 20, are inserted and wedged. By this arrangement, the wheel can be delicately balanced by adding one or more sheets in the various fan apertures as may be required; and by utilizing the location of the fans at and outside the periphery of the wheel for this purpose, the effectiveness of the counterbalancing weights is increased.

Each feed roll is preferably made of a series of cylindric sectors 21 mounted on the respective shafts 22 and 22^a by means of the intervening collars 23, to which collars the

sectors are fastened by the rivets 24. The sectors are provided with annular series of radial teeth 25 and 25ª, which are arranged to form parallel rows around the roll. The forward edges 26 and 26ª of the teeth, are preferably curved to facilitate their withdrawal from the forage. One cleaning finger 27 or 27ª is located between each row of teeth, on the side of the roll which is presented to the opposing roll, and in the case of the lower roll each finger 27 is curved downward around the forward side of the cylindric body of the roll to a pivotal bearing on the transversely mounted bar 28, located below the forward side of the roll and extending between and secured to the side plates 29 of the machine frame; and the other ends of the lower fingers are extended rearward from the upper side of the roll and after spanning the interval between the roll and the adjacent cutter bar 30, terminate above but not in contact with the cutter bar, the lower edge 31 of the rear end of the finger being preferably beveled to reduce the thickness of the extreme end of the finger.

The rear ends of the lower fingers are supported on the legs 32 which may be either pivotally riveted to the fingers as at 33 in Fig. 2, or formed integral therewith as shown in the modified form in Fig. 7. The lower ends of these legs are normally supported on the transverse bar 34 which extends between and is secured to the side plates 29, which bar passes through the slotted ends 35 of the legs, which slots are so shaped that the respective fingers and legs can be slightly oscillated on the pivotal rods 28. The lower fingers are located and supported so that they do not touch or rest on the cylindric body of the roll or the cutter bar at any time, which prevents any frictional contact with the roll and any clogging of the forage around the forward ends of the fingers and against the rear end of the cutter bar.

The location of the fingers on each side of the feed roll teeth serves as an abutment to hold the forage while the teeth are being withdrawn from the same; and furthermore, the lower fingers, taken together, form a table which spans the interval between the lower feed roll and the cutter bar, on which table the forage travels over this interval. It is evident that in event any forage drops down between or around the ends of the fingers and back of the cutter bar, it will be carried along and will slip over the ends of the fingers, which same are free to be slightly elevated to increase the space between the fingers and the cutter bar if the same is necessary.

The fingers 27ª of the upper feed roll are similarly shaped and inversely positioned, the forward ends being curved upward around the forward side of the cylindric body of the roll and are pivotally suspended from the transverse bar 28ª located above the forward side of the roll and extending between and secured to the depending link plates 36 in which the bearings as 37 for the upper feed roll are formed or secured; and the forward ends of the upper fingers are suspended by the legs 32ª from the transverse rod 34ª by means of the slotted ends 35ª which are shaped so that the legs are adapted to be oscillated on the pivot bar. The fingers of the upper feed roll like the fingers of the lower roll serve as an abutment for the forage when the teeth of the upper roll are being withdrawn therefrom; and the forward ends of the upper fingers are extended forward and terminate above the forward ends of the lower fingers.

The series of fingers above and below, taken together form the upper and lower walls of a throat through which the forage is guided from the feed rolls to the cutter bar. And it is evident that as each finger is adapted to oscillate independently of the other, the upper fingers are adapted to be slightly elevated to accommodate the varying thickness of the forage between the rolls, and that this elevation is not necessarily made by all the fingers at the same time but adapts itself to the varying thickness of the forage in different portions of its width. The upper fingers, like the lower ones, are so mounted that they do not at any time come in contact with the cylindric body of the roll so that there is never any frictional contact therewith.

In the modified form of the fingers 27ᵇ and 27ᶜ which is shown in Fig. 7, the supporting and suspending legs 32ᵇ and 32ᶜ are made integral with the fingers, and in the same figure the upward oscillation of the fingers is indicated in broken lines; and it will be understood that it is not essential to provide slotted supports for the rear ends of the fingers, although the slight oscillation of the fingers thereby permitted is very desirable for the purposes which have been mentioned. It is furthermore evident that some of the benefits of the lower fingers can be realized without the use of the upper fingers, but the presence of the upper fingers is preferred to clean the upper teeth and to form the throat between the feed rolls and the cutter bar, which throat is specially desirable when fine and light materials are being fed into the machine.

The supporting carriage for the upper feed roll includes the horizontally disposed bracket 38 which is pivotally mounted at its forward end on the transverse shaft 39 which is secured on the cover 40 of the feed hopper in front of and parallel with the rolls, and the link-plates 36 provided with the bearings for the upper roll which are

pivoted on opposite sides to the rear end of the bracket by means of the transverse shaft 41. The upper feed roll is held downward in its normal position by the action of the controlling spring 42 which is preferably coiled around the pivotal shaft 39, one end 43 of the spring being secured to the shaft and the other end 44 being engaged with the bracket. The axial shaft 22^a of the upper feed roll is journaled in the bearings 37 in the link-plates 36, and is guided up and down in the vertical slots 45 formed in the side plates of the frame, and it is evident that the upper feed roll will adapt itself to the varying thickness of the forage against the resistible action of the controlling spring but at the same time will be held parallel with the lower roll, and the socket 46 is provided in the bracket into which the handle 47 is adapted to be entered, by means of which the bracket can be rotated on its pivot shaft by manual means to lift the feed roll upward for any desired purpose. Furthermore, by rotatably mounting the transverse shaft 39 in the ears 39^a, the tension of the controlling spring can readily be adjusted by turning the shaft one way or the other, thereby varying the pressure of the upper feed roll for different kinds of forage, the set screw 39^b being provided to lock the shaft in any desired position of adjustment.

The conveyer belt is composed of the transverse slats 48 which are formed or secured on the links of the sprocket chain 49 which is adapted to operate around the sprocket wheels 50 and 50^a which are journaled at the respective ends of the feed trough 51. The forward sprocket wheel 50 is journaled in bearings 52 which are adjustable in the slotted brackets 53 secured to the sides of the forward end of the feed trough, and the conveyer belt is thus adapted to be adjusted by a movement of these bearings in the bracket slots to and from the end of the feed trough. The guides or tracks 54 are provided one on each side in the feed trough, on which tracks the ends of the transverse strips forming the conveyer belt are adapted to travel, and to span the varying interval between the forward cog sprocket wheel and the end of the feed trough, the bridge plates 55 are provided, one under each side of the conveyer belt. The bridge plates are provided with the depending webs 56 in the forward ends of which are formed the bearings 57, by means of which bearings the plates are mounted on the shaft of the forward sprocket wheel, and on the rear ends of the webs are formed the slides 58 which are adapted to operate in the guides 59 formed in the respective tracks. It is evident that as the conveyer belt travels around the forward sprocket wheels, the ends of the transverse strips will ride on the bridge plates across the varying interval between the sprocket wheel and the end of the conveyer trough.

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

1. A fodder-cutter having a case including circular side plates, a resilient peripheral band made in two sections having adjacent ends of each detachably hinged together, an outlet pipe coupled between the other adjacent ends, with means for clamping the band around the plate, the edges of the band being shaped to fit the plate edges, and cutting means mounted in the case.

2. A fodder-cutter having a case including circular side plates, a resilient peripheral band clamped around the plate, the band being made in two sections having adjacent ends of each detachably hinged together, an outlet pipe coupled between the other adjacent ends, the edges of the band being shaped to fit the plate edges, and cutting means mounted in the case.

3. A fodder-cutter having a case including circular side plates, a resilient peripheral band clamped around the plates, an outlet pipe coupled with the band, the edges of the band being shaped to fit the plate edges and the band being outwardly arched intermediate its edges, and cutting means mounted in the case.

4. A fodder-cutter having a case including circular side plates having laterally beveled peripheral edges, a resilient peripheral band clamped around the plates and having edge corrugations adapted to expand to fit the plate edges, an outlet pipe coupled with the band and cutting means mounted in the case.

5. A fodder-cutter having a case including circular side plates, a resilient peripheral band clamped around the plates and having edge corrugations adapted to expand to fit the plate edges, an outlet pipe coupled with the band, and cutting means mounted in the case.

6. In a fodder cutter, a cutter bar and feed mechanism including a pair of rolls having intermeshing series of annular rows of teeth thereon with cleaning fingers interposed between the respective teeth rows, the fingers being pivoted in front of the respective rolls and thence curved around the presented sides thereof and extended rearward to form a throat adjacent to the cutter bar, with means for supporting the fingers free from the rolls and the cutter bar.

7. A fodder cutter feed-mechanism including a pair of rolls having intermeshing series of annular rows of teeth thereon, with cleaning fingers interposed between the respective rolls, the fingers being pivoted in front of the respective rolls and thence curved around the presented sides thereof and extended rearward to form a throat

leading from the rolls, with means for supporting the fingers free from the rolls.

8. A fodder cutter feed-mechanism including a pair of rolls having intermeshing series of annular rows of teeth thereon, with cleaning fingers interposed between the respective rolls, the fingers being oscillatably supported independently of the rolls and extended from the forward sides of the rolls freely around the presented sides thereof and thence rearward to form a throat leading from the rolls.

9. A fodder cutter feed-mechanism including a pair of rolls having intermeshing series of annular rows of teeth thereon, with cleaning fingers interposed between the respective rows, the fingers being supported independently of the rolls and extended from the forward sides of the rolls freely around the presented sides thereof and thence rearward to form a throat leading from the rolls.

10. In a fodder cutter, a cutter bar, an adjacent feed roll having annular rows of teeth thereon and cleaning fingers interposed between the respective rows, each finger being pivoted in front of the roll and thence extended around its upper side and forward over the cutter bar, with means for supporting the fingers free from the roll and the bar.

11. In a fodder cutter, a cutter bar, an adjacent feed roll having annular rows of teeth thereon, and cleaning fingers interposed between the respective rows, each finger being oscillatably mounted independently of the roll and bar and extended from the forward side of the roll freely around the upper side thereof and thence rearward over and adjacent to the bar.

12. In a fodder cutter, a cutter bar, an adjacent feed roll having annular rows of teeth thereon and cleaning fingers interposed between the respective rows, each finger being mounted independently of the roll and bar and extended from the forward side of the roll freely around the upper side thereof and thence rearward over and adjacent to the bar.

13. In a fodder cutter, a cutter bar, an adjacent feed roll having annular rows of teeth thereon and cleaning fingers interposed between the respective rows, each finger being mounted independently of the roll and bar and extended from the forward side of the roll freely around the upper side thereof and thence rearward over and adjacent to the bar, the rear ends of the fingers being tapered.

14. In a fodder cutter, a cutting mechanism, an adjacent feed hopper, a frame having slots in its sides, a pair of feed rolls located one above the other between the rear end of the hopper and the cutting mechanism, the upper feed roll having an axial shaft adapted to be guided up and down in the slots, a horizontally-disposed bracket transversely pivoted at its forward end on the cover of the hopper, and depending links transversely pivoted above on opposite sides to the rear end of the bracket and having bearings below carrying the respective ends of the upper feed roll shaft, the transverse pivots of the bracket and the link-plates being parallel with said feed roll shaft.

JOSEPH DICK.

Witnesses:
JOSEPH FREASE,
HARRY FREASE.