

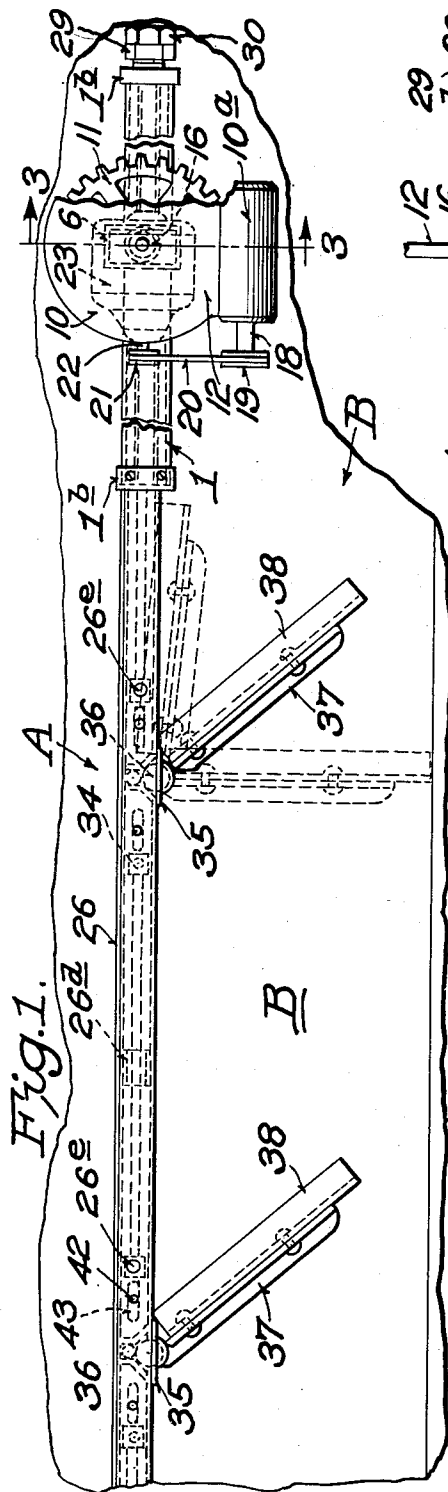
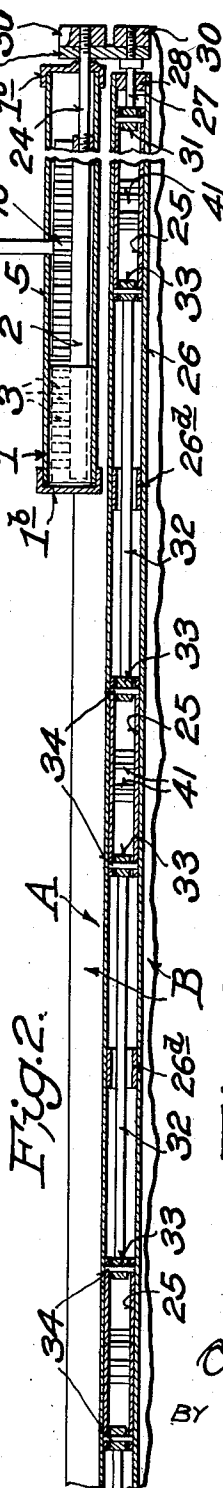
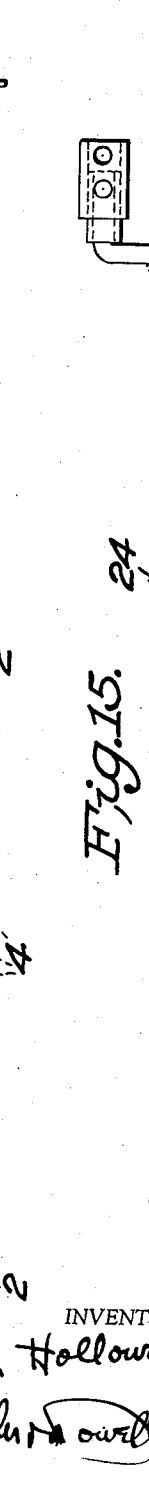
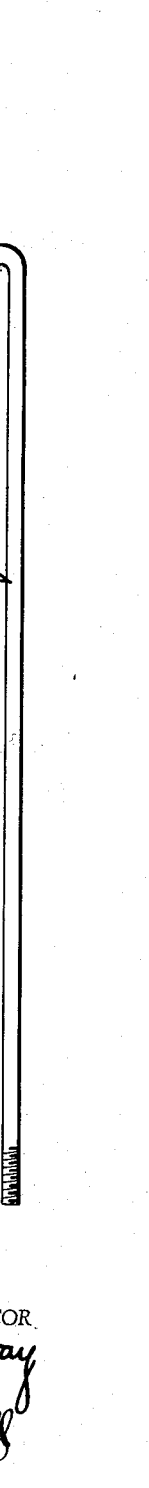
Jan. 26, 1954

C. G. HOLLOWAY
COW BARN GUTTER CLEANER

2,667,264

Filed Nov. 19, 1952

3 Sheets-Sheet 1



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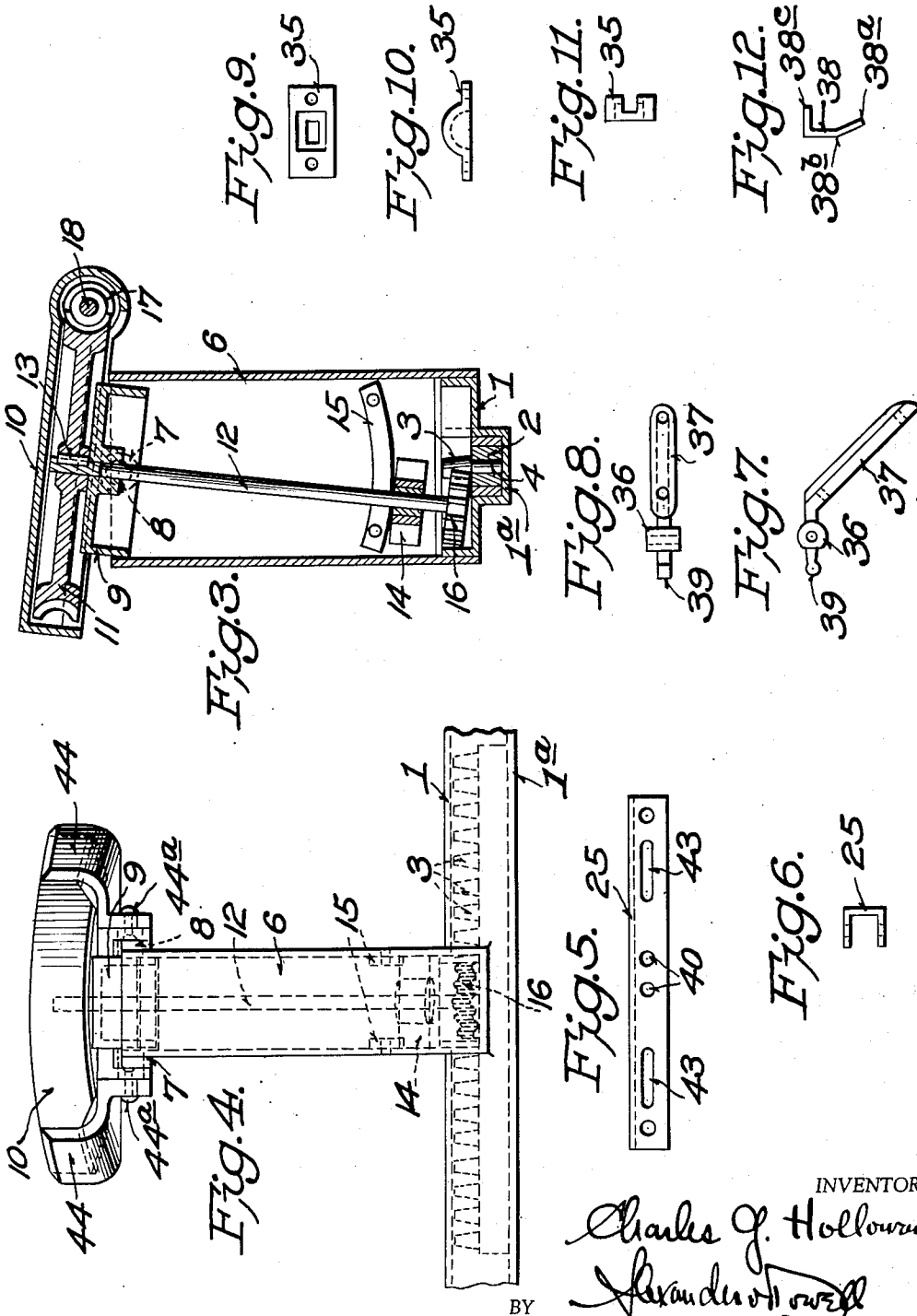
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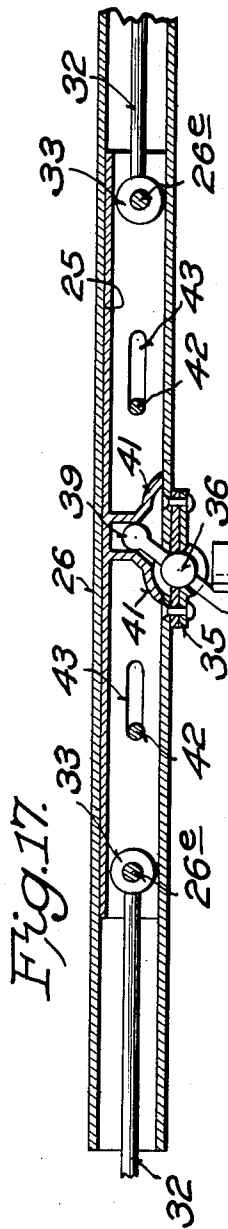
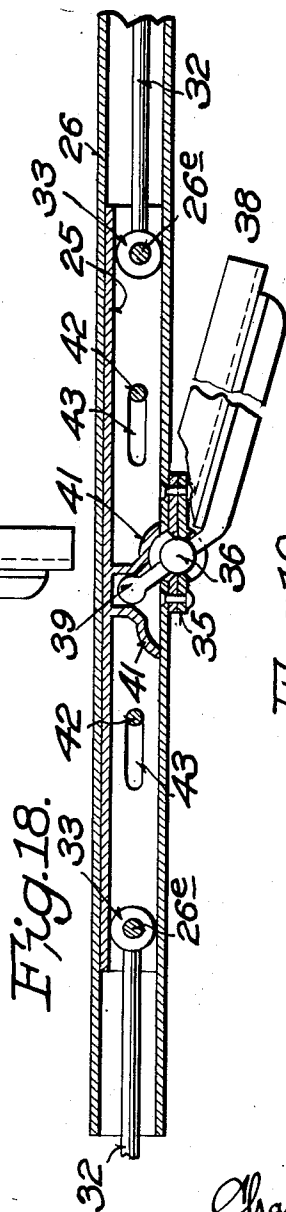
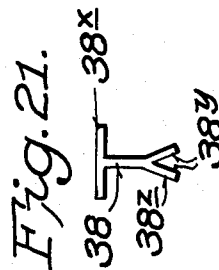
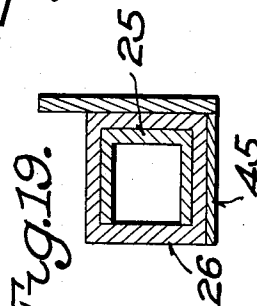
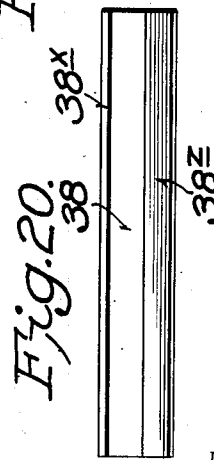
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UNITED STATES PATENT OFFICE

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COW BARN GUTTER CLEANER

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Application November 19, 1952, Serial No. 321,410

18 Claims. (Cl. 198—224)

1

This invention is a novel barn gutter cleaner, such as shown in my application for U. S. Letters Patent, Serial No. 58,539, filed November 5, 1948 (now abandoned), and the principal object thereof is to provide a power driven cleaner which is of novel construction, said construction being simple and having many parts constructed of plastic such as fiberglass or its equivalent, for the purpose of meeting sanitation requirements.

Another object of the invention is to provide a cleaner of the above type consisting of a longitudinally movable member disposed at one side of the gutter, having a series of spaced paddles which are actuated in a novel manner to effect the cleaning of the entire gutter as the movable member is reciprocated.

A further object of the invention is to provide novel means for reciprocating the movable member, said means being of simple and efficient construction and being designed to minimize wear.

A still further object of my invention is to provide novel means to slide or actuate one or more paddles into one or more gutters running parallel to each other or disposed at any angle desired.

I will explain the invention with reference to the accompanying drawings, which illustrate several practical embodiments thereof, to enable others familiar with the art to adopt and use the same; and will summarize in the claims the novel features of constructions, and novel combinations of parts, for which protection is desired.

In said drawings:

Fig. 1 is a top plan view of a gutter showing my novel cleaner arranged therein and showing the paddles in various positions.

Fig. 2 is a longitudinal section through the movable member, and the member reciprocating means.

Fig. 3 is an enlarged section on the line 3—3, Fig. 1.

Fig. 4 is a side elevational view of the parts shown in Fig. 3, showing the slide bar of the movable member in its mid-position.

Fig. 5 is a top plan view of the paddle slide, detached, showing the location of the pins.

Fig. 6 is an end view of the slide shown in Fig. 5.

Fig. 7 is a top view of a paddle arm, detached.

Fig. 8 is an elevation of the paddle arm shown in Fig. 7.

Fig. 9 is a front elevation of one section of the paddle arm bearing, detached.

2

Fig. 10 is a top plan view of the bearing section shown in Fig. 9.

Fig. 11 is an end view of the bearing section shown in Fig. 9.

Fig. 12 is an end elevation of one form of paddle.

Fig. 13 is an elevation of the rack bar for reciprocating the movable member.

Fig. 14 is a top plan view of the parts shown in Fig. 13.

Fig. 15 is a side elevation of the reciprocating rod.

Fig. 16 is an end elevational view of another form of paddle, detached.

Figs. 17 and 18 are enlarged sectional views illustrating the paddle movement.

Fig. 19 is a transverse section through the casing showing a hoe.

Fig. 20 is a side elevation showing a T-shaped paddle.

Fig. 21 is an end elevation of the paddle shown in Fig. 20.

As shown in Fig. 1, the barn floor A is provided, in rear of the cattle stalls, with a depressed gutter B in the customary manner. At one end of the gutter B is a fixed frame 1 which is supported above the bottom of gutter B in any desired manner, said frame 1 having a central depressed portion 1a (Fig. 3) and being enclosed at each end by caps 1b for assembly purposes, the depressed portion 1a serving as a guide for a slidable bar 2 (Figs. 2, 3, 13 and 14), said bar 2 being movable longitudinally of the gutter B, the same being reciprocated by novel means hereinafter set forth.

On the top of slide bar 2 are a series of rollers 3 which may be either tapered or straight, but are shown in Fig. 3 as being tapered, the same being mounted upon stub shafts 4 which are secured in bores in any desired manner in slide bar 2, the upper ends of the stub shafts 4 being connected above the rollers 3 by a plate 5 (Figs. 13 and 14) to give rigidity to the stub shafts 4, the rollers 3 freely rotating upon the stub shafts 4, and the plate 5 ending with the first and last stub shaft 4 of the series, for the purpose hereinafter set forth.

Upon the frame 1 at approximately the center thereof is a box 6 (Figs. 1 and 3), the side plates of which embrace the sides of frame 1 at their lower ends, as shown more particularly in Fig. 3, box 6 carrying bearings 7 at its upper end for the trunnions of lugs 8 of a pivoted casting 9 which supports a housing 10 for a worm gear 11 (Fig. 3), the worm gear being mounted upon the upper

3

end of a shaft 12 above the casting 9, and said shaft 12 being journaled at the center of the casting 9, as shown in Fig. 3. The worm housing 10 is held by brackets 44 (Fig. 4) secured by pins 44a which pass into the casting 9. Gear 11 is fixedly mounted by means of key 13 or the like for rotation with the shaft 12. By the above construction the shaft 12 may pivot on a horizontal axis with respect to the walls of box 6. The lower end of shaft 12 carries a sliding bearing 14 engaging an arcuate guide 15 secured within box 6 in any desired manner.

The lower end of the shaft 12 carries a star wheel 16 (Fig. 3) which extends down into the open upper end of frame 1 and lies to one side or the other of the series of rollers 3 as shown in Fig. 3, so that as shaft 12 is rotated by rotation of the worm gear 11, slide bar 2 will be moved in one direction or the other. Worm gear 11 is driven by means of a worm 17 housed within an offset portion 10a of cover 10 (Fig. 1), said worm 17 being mounted upon a shaft 18 and carrying a sprocket or pulley 19 or the like which is driven by a belt or chain 20 which runs around a sprocket or pulley 21 on the shaft 22 of a power unit 23 that is activated by electricity, air, steam, gasoline or the like, the shaft 22 of the unit rotating constantly in one direction when activated. When the star wheel 16 reaches the roller 3 at either end of the series, the star wheel will pivot around the outer side of such roller and the shaft 12 will swing to bring the star wheel 16 on the other side of the series of rollers 3 and thereby automatically move the slide bar 2 in the opposite direction. By the above construction, a continuous reciprocating motion of the slide bar 2 is effected in a simple, novel manner.

Connected to one end of slide bar 2 is a bar 24 (Fig. 2) extending through the outer end of frame 1, same being slidable therein. Below the frame 1 in the bottom of the trough B is a movable composite casing formed in sections, the same comprising a casing 25 of U-shaped cross-section mounted in an outer casing 26 but being slidable therein, the casing 25 being actuated by a bar 27 extending through a block 28 in the end of the casing 26, rods 24 and 27 being connected by a strap 29 secured thereon by bolts and nuts 30 so as to cause the bars 24 and 27 to move in unison. The inner end of bar 27 carries a head 31 which is normally spaced from the block 28 so as to permit a dwell between movement of the bar 27 and the casing 26 under conditions hereinafter explained.

The function of the member 25 will be hereinafter explained.

Within the outer casing 26 are a series of spaced members 25 identical with the above mentioned number 25, and between the spaced members 25 are bars 32 within the casing 25 having heads 33 on their ends receiving pins 34 which extend through the members 25 and the heads 33 of the bars 32, the said pins 34 being insertable and removable through holes 26e (Fig. 1) which may be normally closed by plugs (not shown) or cover plates. By the above construction the members 25 and the bars 32 will move in unison with the bar 27 while the assembly of members 25 and bars 32 may be shifted within the outer casing 26 an amount equal to the play between the head 31 of bar 27 and bearing block 28 as the bar 24 is reciprocated.

The front or outer face of the movable casing 26 opposite the centers of each of the members 25 is provided with a rectangular opening across

4

which the opposed halves of a socket 35 (Figs. 1, 17 and 18) are secured by bolts passing through holes therein, the two sections 35 together forming a socket for a cylindrical bearing 36 (Figs. 7 and 8) which is carried at the inner end of each paddle arm 37. On each arm is mounted a paddle (Fig. 12) having an upper flange 38c and having an offset lower portion 38a in the direction of flange 38c for the purpose of giving a downward pressure to the paddle; the portion being bent at 38b below the flange 38c and being mounted in such manner as to have constant contact with the gutter floor. In Figs. 20 and 21 a modified construction of the paddles is shown in which the paddle has a T-shaped upper end 38z, the lower edge being split as at 38y and the split portion being offset as at 38x in opposite directions to make the paddle operable in both directions of swing.

By the above construction the paddle arms 37 and the paddles 38 are free to swing into any of the positions shown in dotted lines in Figs. 1, 17 and 18 or any intermediate positions, the swinging movement of the balls 39 on the inner ends of the paddle arms 37 being limited by pairs of pins mounted in openings 40 (Fig. 5) through the members 25. An alternate construction is shown in Figs. 17 and 18 in which spaced pairs of ribs 41 replace the pins and embrace the heads 39.

For wearing purposes for gutters made of other material than concrete a shoe 45 is provided on the bottom of the casing 26 to give longer wear (Fig. 19).

As shown in Figs. 1, 17 and 18 the outer casing 26 is provided with a series of pins 42 which extend downwardly into slots 43 in the top and bottom of the members 25 so that the members 25 and 32 may have a limited movement within the outer member 26 for the purpose hereinafter described. The outer member also carries coupling bearings 26d for the purpose of connecting one section to another, also for strengthening the rods 32 preventing same from buckling.

By the above construction, as the members 25 and 26 are shifted by the rod 27 the outer casing 26 will move in both directions the full length of rack 2. While initially starting from either end, the inner member is moved an amount equal to the extent of slots 43 (Figs. 5, 17, and 18) or the distance between the head 31 and the bearing block 28 (Fig. 2). This initial movement of the members 25 and 32 which are connected together is for the purpose of first opening or closing the paddles before the paddles are moved longitudinally of the trough.

It is obvious that in Fig. 1 the paddles shown in full lines are in their mid positions, the pins 42 being shown centrally of the slots 43. If the assembly 25, 26 and 32 (Figs. 17 and 18) is moved to the right in Fig. 1, the pins 42 will engage the left-hand end of the slots 43, this movement being permitted by the space between the head 31 and the bearing block 28. When reaching such position, the heads 39 on arms 37 will have engaged the left-hand pin in hole 40 of member 25 and will initially shift the paddle into the position in which it is disposed transversely of the trench, as shown in dotted lines in Fig. 1 before the casing 26 itself starts to move towards the right. Thus, the paddle 38 will be in the proper scraping position before the casing 26 is actually moved to the right. When the star wheel reaches the opposite end of the rack teeth and rolls around said end, rod 24 will then start shifting

5

to the left before the member 26 starts to move. Thus, the blades 38 will be shifted into position substantially parallel with the gutter, as shown in dotted lines in Fig. 1, before the member 26 starts to shift to the left. Thus, the entire system of paddles initially is projected transversely of the gutter and simultaneously shifted substantially parallel with the gutter between each movement of the rod 24 to scrape the refuse along the gutter, by a series of intermittent steps, from one end of the gutter to the other.

I do not limit my invention to the exact forms shown in the drawings, for obviously changes may be made therein within the scope of the claims.

I claim:

1. A gutter cleaner, comprising an elongated outer casing axially slidably mounted at one side of a gutter and having one end closed; a series of spaced inner casings connected together and axially movably mounted within the outer casing; a rod extending through the closed end and having a head on its inner end connected with the series of inner casings, said head being normally spaced from the closed end; said rod having a strap on its outer end adapted to engage said rod; means for reciprocating said rod; said outer casing having openings in its outer face opposite the respective inner casings; bearings removably secured across said openings; arms pivoted in said bearings and adapted in one position to extend across said gutter; paddles carried by the respective arms; and heads on the inner ends of said arms engaging pairs of abutments within the inner casings respectively, whereby as the rod is moved in one direction the arms will be initially pivoted into positions substantially normal to the outer casing before the outer casing is moved, and as the rod is moved in the opposite direction the arms will be initially simultaneously pivoted into positions substantially parallel with the outer casing before the outer casing is moved.

2. In a cleaner as set forth in claim 1, said inner casings comprising U-shaped members; bars between adjacent inner casings having heads entering said inner casings; and pins transfixing the inner casings and bar heads to lock the parts together.

3. In a cleaner as set forth in claim 1, said inner casings comprising U-shaped members; bars between adjacent inner casings having heads entering said inner casings; and pins transfixing the inner casings and bar heads to lock the parts together; and said abutments comprising spaced pairs of pins on said inner casings straddling the heads of said arms.

4. In a cleaner as set forth in claim 1, said inner casings comprising U-shaped members; bars between adjacent inner casings having heads entering said inner casings; and pins transfixing the inner casings and bar heads to lock the parts together; and said abutments comprising spaced pairs of pins within said inner casings straddling the heads of said arms.

5. In a cleaner as set forth in claim 1, each paddle comprising a plate having a flange at its upper end and having its lower end offset in the direction of said flange, whereby the scraped material will exert a downward force on the gutter floor.

6. In a cleaner as set forth in claim 1, each paddle comprising a plate having a T-shaped upper end, the lower end of the plate being vertically split and the split portion being offset in opposite directions, whereby the scraped ma-

6

terial will exert a downward force on the gutter floor.

7. In a cleaner as set forth in claim 1, said rod reciprocating means comprising a bar slidably in guides in a fixed frame disposed above the outer casing and parallel therewith; a second rod secured to the slidable bar and extending through the fixed frame; means connecting the first and second rods together for unitary movement; and means for reciprocating the slidable bar.

8. In a cleaner as set forth in claim 7, said reciprocating means comprising a series of spaced rollers journaled on the top of said slidable bar; a casing above and secured to said frame; a casting pivoted on a horizontal axis in said casing; a shaft journaled in said casting; a star wheel at the lower end of said shaft adapted to engage either side of the rollers, said star wheel pivoting around the end rollers and engaging the series of rollers from the opposite side of the slidable bar whenever the star wheel engages said end rollers; and means for rotating said shaft.

9. In a cleaner as set forth in claim 8, said rotating means comprising a worm gear on said shaft; a cover plate carried by said casting and overlying the worm gear; and a power driven worm journaled in bearings in said cover plate and meshing with said worm gear.

10. A gutter cleaner of the character described, comprising an elongated outer casing axially slidably mounted at one side of said gutter; a series of spaced inner casings connected together and axially movably mounted within the outer casing; a rod extending through the outer casing; means for reciprocating the said rod; a series of pins on the outer casing engaging elongated slots in the inner casings to limit the movement of the inner casings within the outer casing as the rod is reciprocated; said outer casing having openings in its outer face opposite the respective inner casings; bearings removably secured across said openings; arms pivoted in said bearings and adapted in one position to extend across said gutter; paddles carried by the respective arms; and heads on the inner ends of said arms engaging pairs of abutments within the inner casings respectively disposed adjacent the bearings, whereby as the rod is moved in one direction the arms will be initially pivoted into positions substantially normal to the outer casing before the outer casing is moved, and as the rod is moved in the opposite direction the arms will be initially simultaneously pivoted into positions substantially parallel with the outer casing before the outer casing is moved.

11. In a cleaner as set forth in claim 10, said inner casings comprising U-shaped members having the openings between their legs facing the bearings; bars between adjacent inner casings having heads entering said inner casings; and pins transfixing the inner casings and bar heads to lock the parts together; said outer casing having other openings therein giving access to said pins.

12. In a cleaner as set forth in claim 10, said inner casings comprising U-shaped members having the openings between their legs facing the bearings; bars between adjacent inner casings having heads entering said inner casings; and pins transfixing the inner casings and bar heads to lock the parts together; said outer casing having other openings therein giving access to said pins; and said abutments comprising spaced pairs of pins extending through one leg of said inner casings straddling the heads of said arms.

13. In a cleaner as set forth in claim 10, said

7

inner casings comprising U-shaped members having the openings between the legs facing their bearings; bars between adjacent inner casings having heads entering said inner casings; and pins transfixing the inner casings and bar heads to lock the parts together; said outer casing having other openings therein giving access to said pins; and said abutments comprising spaced pairs of pins within said inner casings straddling the heads of said arms.

14. In a cleaner as set forth in claim 10, each paddle comprising a plate having a flange at its upper end and having its lower end offset in the direction of said flange whereby the scraped material will exert a downward force on the gutter floor.

15. In a cleaner as set forth in claim 10, each paddle comprising a plate having a T-shaped upper end, the lower end of the plate being vertically split and the split portion being offset in opposite directions whereby the scraped material will exert a downward force on the gutter floor.

16. In a cleaner as set forth in claim 10, said rod reciprocating means comprising a bar slidable in guides in a fixed frame disposed above the outer casing and parallel therewith; a second rod secured to the slidable bar and extending through the fixed frame; means connecting the first and second rods together for unitary move-

8

ment; and means for reciprocating the slidable bar.

17. In a cleaner as set forth in claim 16, said reciprocating means comprising a series of spaced rollers journaled on the top of said slidable bar; a casing above and secured to said frame; a casting pivoted on a horizontal axis in said casing; a shaft journaled in said casting; a star wheel at the lower end of said shaft and adapted to engage either side of the rollers, said star wheel pivoting around the end rollers and engaging the series of rollers from the opposite side of the slidable bar whenever the star wheel engages said end rollers; and means for rotating said shaft.

18. In a cleaner as set forth in claim 17, said rotating means comprising a worm gear on said shaft; a cover plate carried by said casting and overlying the worm gear; and a power driven worm journaled in bearings in said cover plate and meshing with said worm gear.

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