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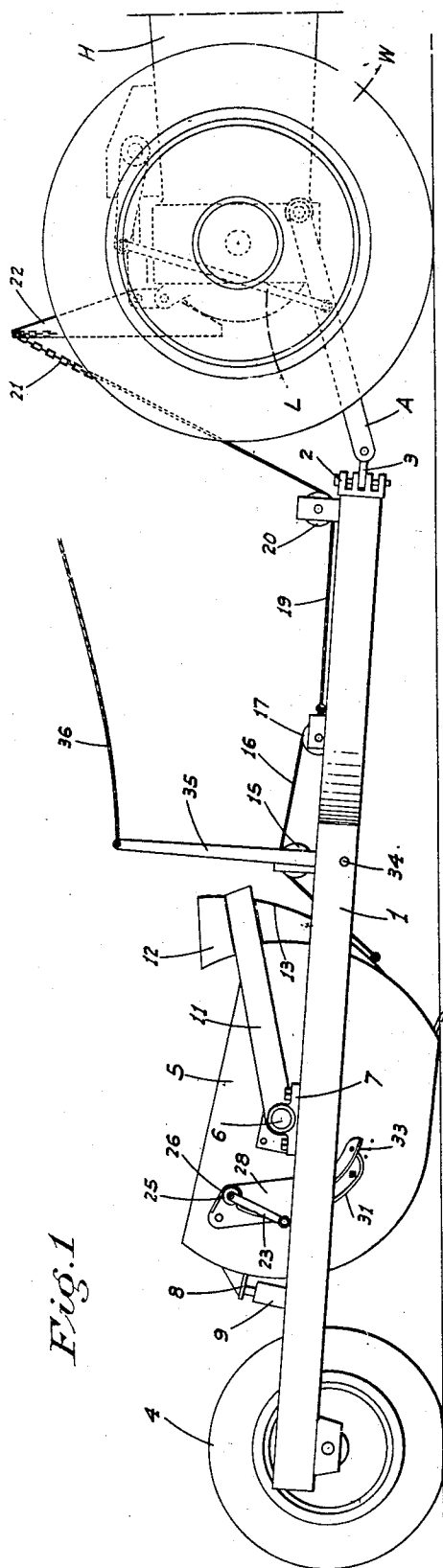
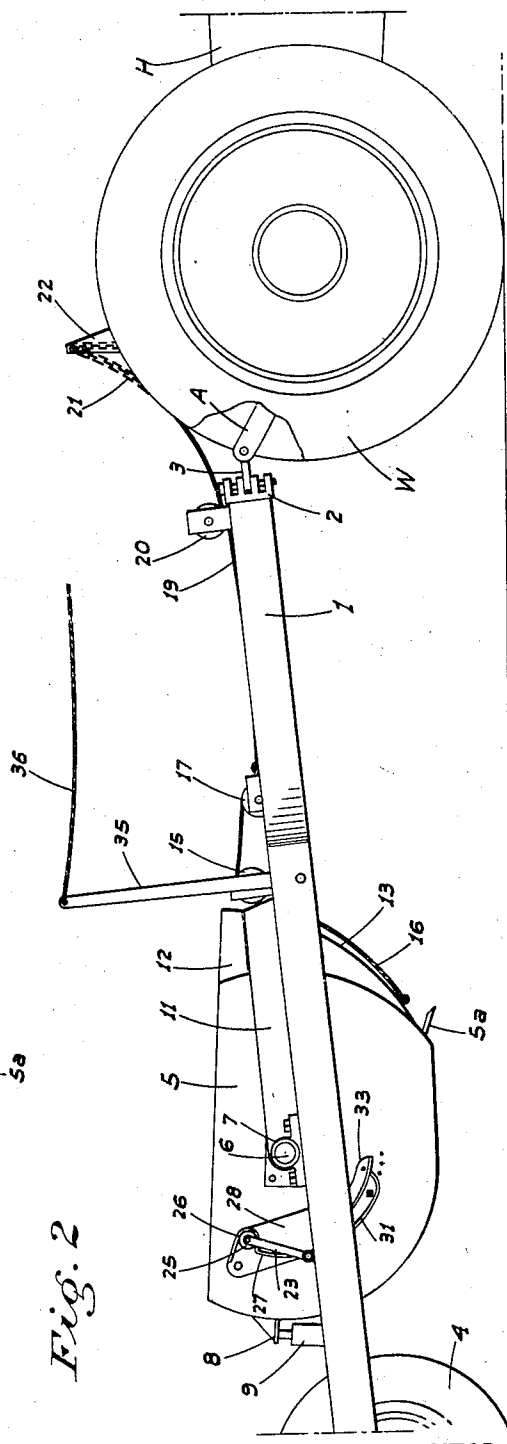
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2,329,210

SCRAPER

Filed Nov. 22, 1940

4 Sheets-Sheet 1



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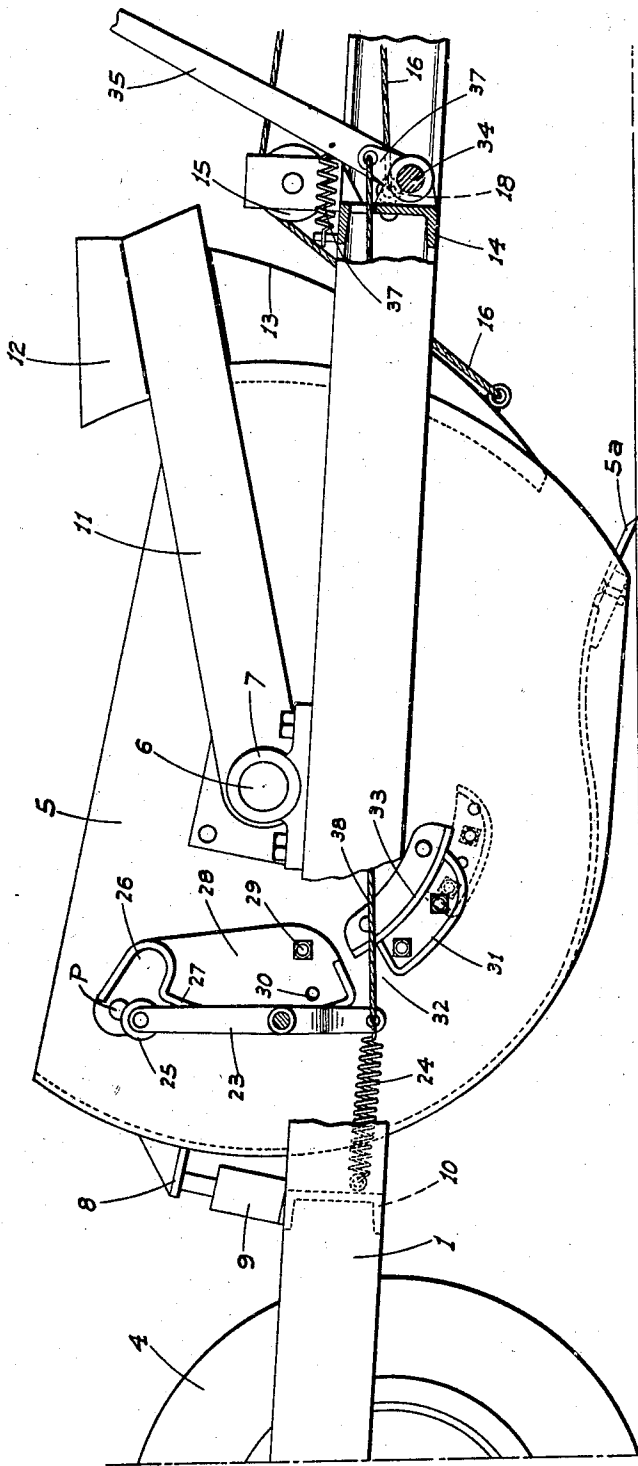
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Fig. 3



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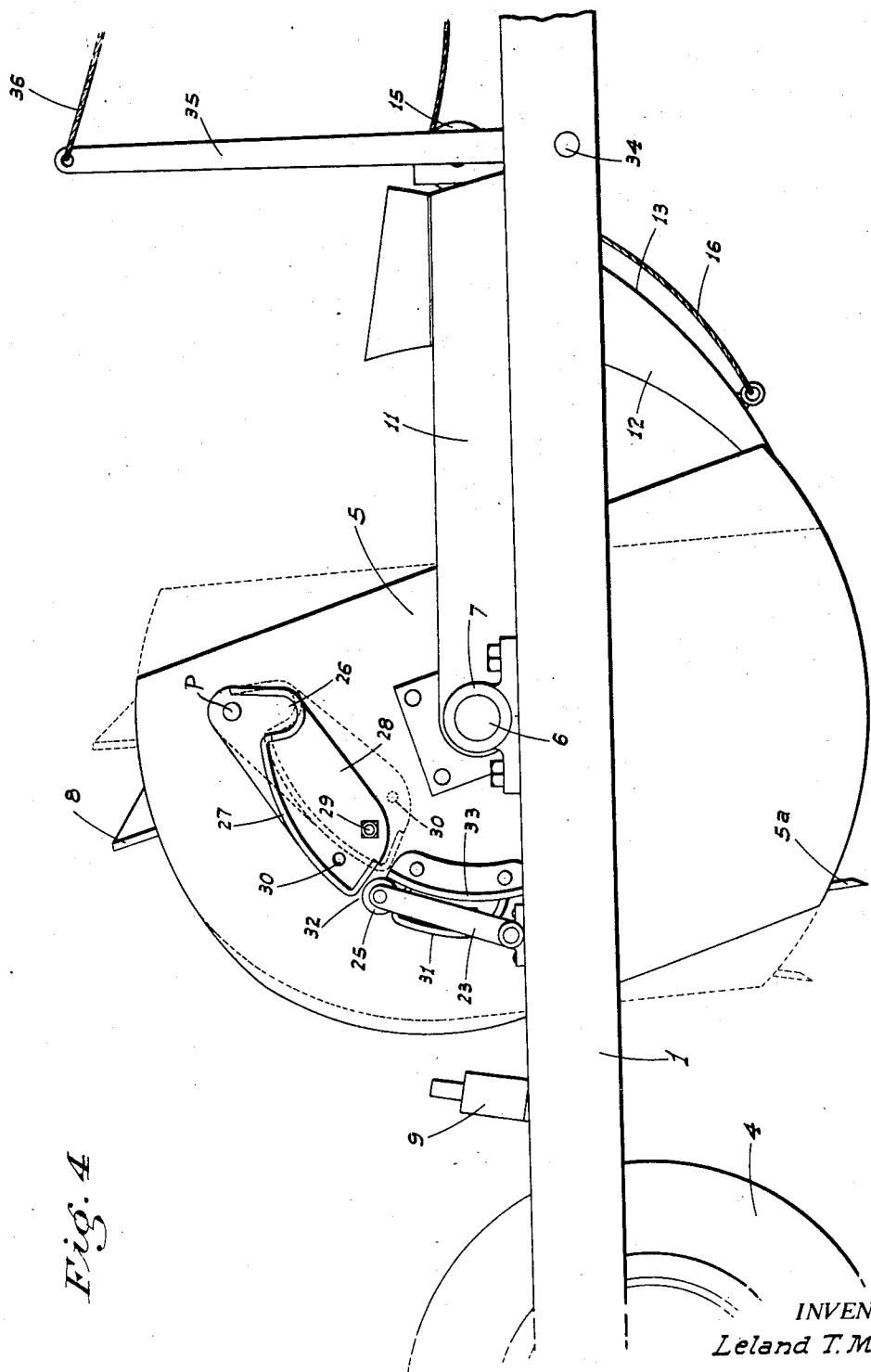


Fig. 4

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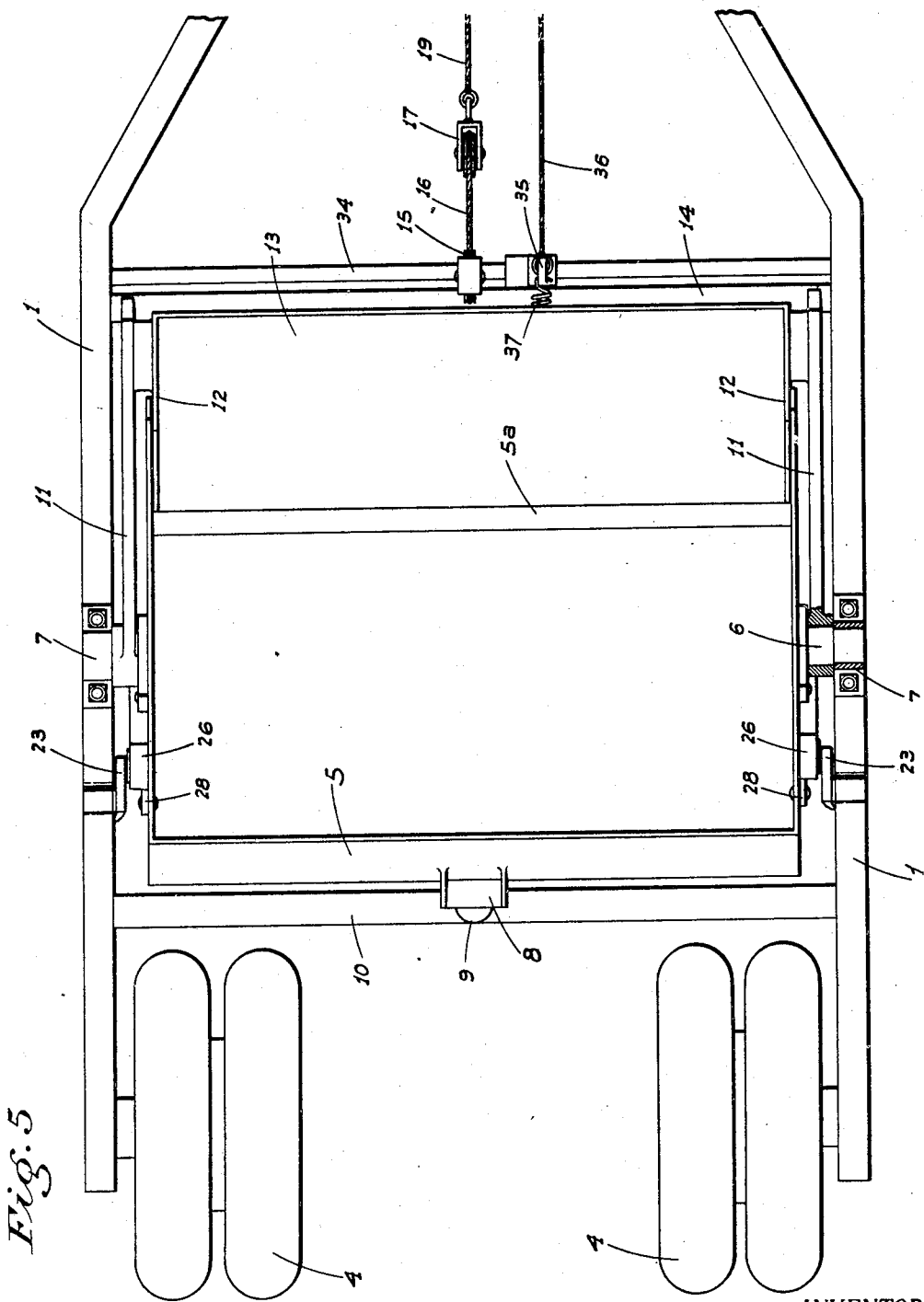


Fig. 5

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SCRAPER

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Application November 22, 1940, Serial No. 366,571

12 Claims. (Cl. 37-129)

This invention relates to a carrying scraper of that type which includes a wheel supported frame adapted to be hauled by a tractor, a bowl swung in the frame for rotation between digging and full dumping positions, and a front apron to cooperate with the bowl to form a closure for the front end of the bowl when in carrying position.

The scraper frame is intended for connection with a tractor having a vertically adjustable drawbar, and one of the objects of my invention is to connect the apron to the tractor in such a manner that when the scraper frame is lifted by upward movement of the draw-bar to shift the bowl from digging to carrying position, the apron will automatically assume a closure forming position, and vice versa.

Another object is to provide what I believe to be novel means for controlling the rotation of the bowl, so that it may assume and be held in various operating positions, for full dumping or leveling, and returned to a normal position relative to the frame, without any backing up of the tractor being necessary.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of the scraper as connected to a tractor and in digging position.

Figure 2 is a similar view showing the scraper in carrying position.

Figure 3 is an enlarged side view of the scraper bowl and adjacent parts, showing the bowl as released for rotation and disposed at the beginning of a dumping movement.

Figure 4 is a similar view showing the bowl as swung to a dumping and leveling position.

Figure 5 is a fragmentary top plan of the scraper.

Referring now more particularly to the characters of reference on the drawings, the tractor for use with which my scraper is designed, includes a mechanism housing H supported at its rear end by drive wheels W. A drawbar unit includes arms A pivoted on the housing below and ahead of the wheel axle and which arms are connected intermediate their ends to upstanding

vertically adjustable links L, actuated by mechanism under the control of the driver of the tractor, and constituting a hoisting means.

The scraper comprises a frame which includes side beams 1 of inwardly facing channel form, which converge to their forward end where they are provided with a coupling head 2 adapted for adjustable engagement with a coupling link 3 swivelly mounted on and projecting from the drawbar unit. The frame at its rear end is supported by dual wheel units 4 disposed laterally inward of beams 1.

The bowl 5, of rounded back form and having a downwardly sloping blade 5a at its forward end, is disposed between beams 1 ahead of wheels 4, being provided with side trunnions 6 turnable in bearings 7 mounted on the beams 1. The trunnions are disposed on the bowl so that the latter tends to swing down at the back of its own weight; such swinging being cushioned and the extent of movement of the bowl in that direction being limited by the engagement of a pad 8 on the back of the bowl with a hydraulic shock absorbing unit 9 upstanding from a crossbeam 10 on the frame just back of the bowl.

Swung on trunnions 6 between the bearings and the bowl are forwardly projecting side arms 11, which at their forward end are secured on the side wings 12 of an apron 13, the wings being overlapped somewhat by the side plates of the bowl. The forward edges of the side plates, and the rear edges of the wings, are curved concentric with the trunnions so that they always maintain the same degree of overlap.

When the bowl is disposed in a normal position relative to the frame and the apron is closed against the blade, the arms 11—which project ahead of the apron but are of course laterally inward of beams 1—rest at their forward end on a frame crossbeam 14 disposed just ahead of the apron (see Figs. 3 and 5).

Fixed on said crossbeam is an upstanding pulley 15. A cable 16 is attached to the front of the apron, near the bottom, extends upwardly and over said pulley, about a floating pulley 17 ahead, and back to an anchor on the beam 14 as indicated at 18 in Fig. 3. Another cable 19 is secured on pulley 17 and extends thence forwardly and under a pulley 20 mounted on the scraper frame at its forward end. The cable 19 extends upwardly from pulley 20, preferably terminating in a length of chain 21 by which adjustable connection may be readily made with a supporting arm 22 rigidly mounted on and upstanding from the rear end of the tractor housing H a consid-

erable distance above the drawbar unit. The operative length of cables 16 and 19 is such that when the drawbar is in its lowest position, and the scraper frame is tilted down with the bowl engaging the ground, the apron is raised from its closing position relative to the bowl as shown in Fig. 1.

When the drawbar unit swings up to raise the frame and bowl clear of the ground, the distance between the pulley 20 and the point of connection of the chain 21 with arm 22 is considerably decreased, as shown in Fig. 2. As a result, the pull on the cables is removed and the latter becomes slack, the apron then dropping of its own weight to a closure forming position.

The fixed and floating pulley arrangement, and the cable 16, double the apron movement relative to the movement of cable 19, so that a quick opening and closing movement of the apron takes place with a minimum of upward movement of the drawbar unit from its lowest position. The actual extent of opening movement of the apron of course depends on the point of connection of chain 21 with arm 22, as will be evident, and does not affect the closing of the apron, since the cables become slack in any event long before the drawbar unit reaches its top limit of movement.

To control the setting of the bowl at different positions, I provide the following arrangement: Pivoted intermediate their ends on the beams 1 back of the trunnions are upstanding arms 23, one on each side, their upper ends being pulled forwardly by tension springs 24 (see Fig. 3). Each arm at its upper end carries a roller 25 adapted to engage a socket 26 on the side of the bowl ahead of the roller. When the roller is engaged in the socket, the bowl is in a normal position relative to the frame, for scraping or carrying, according to the tilt of the frame as controlled by the drawbar movement.

A curved roller engaging track 27 depends from the rear bottom edge of the socket, the socket and track being formed on a plate 28 pivoted at P at its upper end on the side of the bowl for swinging movement in a plane parallel to said side, being held in either one of two positions by a removable bolt 29 projecting through the side of the bowl and one or the other of a pair of holes 30 in said plate.

The track 27 is normally concentric with trunnion 6 and is aligned with a circumferentially adjustable track section 31 below plate 28. The space between plate 28 and section 31 is normally just sufficient to receive the roller 25 and thus forms another socket 32; the bottom edge of the plate and the top of the section 31 being substantially radial with the bowl and being provided with track continuations as shown to retain the roller. The bottom of socket 32 is formed by a fixed flange 33 concentric with the bowl trunnions and about which section 31 may be adjusted.

To pull the arms 23 so that the rollers will clear either socket when desired, a cross shaft 34 is mounted on the frame ahead of cross beam 14. A lever 35 projects upwardly from this shaft and a pull rope 36, operable from the tractor, is attached thereto. Short, upstanding arms 37 are fixed on the shaft inside the channel beams 1, and are connected to the lower end of arms 23 by flexible pull cables 38 (see Fig. 3). The operation is as follows: To scrape a load, the drawbar unit is dropped, which lowers the bowl into scraping contact with the ground and raises the apron

as previously described; the rollers 24 being then engaged in sockets 26 to hold the bowl rigid with the frame. When the bowl is loaded, the drawbar unit is raised, raising the bowl and causing the apron to assume a closed position.

When the scraper is being used for leveling operations, the plate 28 is left in its normal position, and the loaded bowl is lowered, at the desired point of initial discharge, so that the blade will engage the ground and impart the necessary initial rotative pressure to the bowl with the forward movement of the tractor. The lever 35 is then pulled as shown in Fig. 3 and almost at once released, so that the rollers are withdrawn from sockets 26 to enable the bowl to rotate. The rollers will then ride tracks 27 until they drop, by reason of the pressure of springs 24, into sockets 32. When the bowl is thus held from further rotation, the blade is raised somewhat from the ground in leveling position as shown in Fig. 4, without raising the drawbar unit. Since the bowl still tends to rotate due to the pressure of the blade against the discharging dirt, the rollers will bear against the sections 31. If, therefore, it is desired to raise the blade somewhat higher, as indicated in Fig. 4, and still without moving the drawbar unit, it is only necessary to shift the section 31, as indicated in Fig. 3, thus making the socket 32 wider and increasing the distance between socket 36 and the roller engaging edge of socket 32. This of course must be done before operations are started, it being assumed that the operator knows ahead of time whether he wants a shallow or deep leveling operation. The leveling depth may of course be independently controlled irrespective of the relative setting of the bowl as above described, by the controlled vertical movement of the drawbar unit, which raises or lowers the frame and bowl as a unit.

When the load is fully discharged and the rotative pressure of the dirt is no longer exerted against the blade, the frame and bowl is raised to clear the latter, including blade 5a, from the ground, and the lever 35 is again pulled, withdrawing rollers 25 from sockets 32, whereupon the bowl will swing of its own weight in the opposite direction and back to its initial normal position, as previously recited.

If the load is to be dumped in one spot only, as when making borders or thick fills, the plate 28 is initially swung so that the track 27 at the bottom aligns with the member 33 at socket 32, as shown in dotted lines in Fig. 4.

When the plate is in this position, an initial pull on and a subsequent release of the lever 35 is all that is necessary, a suitably arranged spring 37 returning the lever to its normal position. The bowl then swings until rollers 25 are stopped by sections 31, and as soon as the bowl is empty, the rollers will ride the tracks 27 until they reach sockets 26, with the return swinging of the empty bowl, without any further manipulation of lever 35. With such a dumping operation, the section 31 may be adjusted to any desired position, since member 33 then forms a continuation of the roller engaging track 27.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a de-

parture from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A scraper including a frame, wheels supporting the frame at its rear end, a bowl supported in a fixed position in the frame ahead of the wheels, an apron mounted in connection with the bowl for movement between open and closed positions relative to the front of the bowl, a draft vehicle having a vertically movable draft unit connected to the frame at its forward end and means to raise and lower the apron with the respective lowering and raising of the forward end of the frame from a predetermined level; said means including a flexible cable unit attached to the apron, a guide element for the unit on the frame in front of the apron above the point of connection of the unit therewith, another guide element for the unit on the frame at its forward end, and an anchor for said unit on the vehicle above the last named guide element and the draft unit.

2. A structure as in claim 1 in which the cable unit is of a length such as to become slack before the draft unit reaches its topmost limit of movement.

3. A structure as in claim 1, in which the cable unit is of a length to become taut only with the downward movement of the draft unit and before it reaches the lowest level in its movement; there being means to alter the operative length of the cable unit whereby to alter the point in the downward movement of the draft unit at which such cable unit will first become taut.

4. A scraper including a supporting frame, a bowl, means pivoting the bowl on the frame for relative rotation whereby dumping is effected by forward rotation of the bowl, members on one side of the bowl forming spaced sockets disposed in a circular path substantially concentric with the axis of rotation of the bowl, said sockets facing radially out from the axis of rotation of the bowl, a roller to engage either socket, an arm on which said roller is mounted, means pivoting the arm on the frame radially out from the sockets, the arm and bowl pivot means being parallel, spring means acting on the arm to force the roller toward the sockets, manually operable means to pull the arm in opposition to the spring means, and a roller engaging track connecting the sockets at their rear open end.

5. A scraper including a supporting frame, a bowl, means pivoting the bowl on the frame for relative rotation whereby dumping is effected by forward rotation of the bowl, a plate pivoted adjacent one end against one side of the bowl radially out from its pivot means, a socket formed in said plate adjacent its pivoted end and facing radially out, a spring pressed roller supported from the frame to enter and leave said socket from its open end, a roller-engaging track on the plate projecting circumferentially of the bowl from one edge of the socket in a direction opposite to the forward direction of rotation of the bowl, a member fixed on the side of the bowl beyond and spaced from the plate a distance not less than the diameter of the roller and adapted on its edge nearest the plates to form a stop for the roller; the adjacent edge of the plate, when said plate is in one position forming, with said other member edge, another roller receiving socket, and the track on the plate,

when the plate is swung on its pivot, aligning at its end furthest from the pivot with the bottom of said last named socket, and means to hold the plate in either position.

6. A scraper including a supporting frame, a bowl, means pivoting the bowl on the frame for relative rotation whereby dumping is effected by forward rotation of the bowl, elements on one side of the bowl back of its pivotal axis forming vertically spaced sockets disposed in a circular path substantially concentric with the bowl pivot, a spring pressed roller supported from the frame to enter and leave said sockets from their rear open end, manual means to pull the roller clear of either socket and a roller engaging track member adjustably mounted on the bowl and adapted to extend from the lower rear edge of the upper socket to the upper rear edge of the lower socket, and from said lower rear edge of the upper socket to the bottom of the lower socket; said track member including means forming the top of the lower socket when said member is in the first named position.

7. A scraper including a supporting frame, a bowl, means pivoting the bowl on the frame for relative rotation whereby dumping is effected by forward rotation of the bowl, means on one side of the bowl normally forming circumferentially spaced sockets facing radially out and disposed in a circular path substantially concentric with the bowl pivot, a spring pressed roller supported from the frame to enter and leave said sockets from their open end, and manual means to pull the roller clear of either socket; an element formed as part of said socket means adjustable to remove the side wall of one socket nearest the other socket from the path of the roller and having roller guide means thereon to enable the roller to move, with rotation of the bowl in one direction, from a seated position at said one socket to the other socket without manually pulling the roller out of said seated position.

8. In combination with a draft vehicle, a rigid scraper frame, wheels supporting said frame, a bowl carried by the frame, an apron operatively associated with said bowl for gravitational movement between open and closed positions relative to said bowl, a vertically movable draft unit for coupling said frame to said vehicle and raising and lowering the frame and bowl to position the bowl for loading, carrying and dumping operations, a cable, and means operatively connecting the cable with the vehicle, the frame and the apron so that responsive to lowering of the frame by means of said draft unit, the cable will move the apron into open position relative to said bowl.

9. In combination with a draft vehicle, a rigid scraper frame, wheels supporting said frame, a bowl carried by the frame, an apron operatively associated with said bowl for gravitational movement between open and closed positions relative to said bowl, a vertically movable draft unit for coupling said frame to said vehicle and raising and lowering the frame and bowl to position the bowl for loading, carrying and dumping operations, a cable, and means operatively connecting the cable with the vehicle, the frame and the apron so that responsive to lowering of the frame by means of said draft unit, the cable will move the apron into open position relative to said bowl and will allow the apron to move into bowl closing position when the frame is raised by means of said draft unit.

10. In combination with a draft vehicle, a rigid scraper frame, wheels supporting said frame, a bowl carried by the frame, an apron operatively associated with said bowl for gravitational movement between open and closed positions relative to said bowl, a vertically movable draft unit for coupling said frame to said vehicle and raising and lowering the frame and bowl to position the bowl for loading, carrying and dumping operations, a cable, and means operatively connecting the cable with the vehicle, frame and apron so that the cable will tighten and raise the apron into open position when the frame is lowered by operation of said draft unit and will cause the cable to slacken and release the apron from open position when the draft unit is operated to raise said frame.

11. In combination, a draft vehicle, a rigid scraper frame, wheels supporting the rear part of said frame and affording the raising and lowering of the forward part of the frame about the axis of the wheels, a bowl carried by the frame for movement relative thereto, an apron associated with the bowl for gravitational movement between positions opening and closing the bowl, a vertically movable draft unit for coupling the rigid frame to said draft vehicle and raising and lowering it about the axis of said

wheels to dispose the bowl in carrying, loading and dumping positions, a cable connected at its ends with the apron and draft vehicle respectively, and means associated with the cable and operating to tighten the cable and move the apron into open position when the frame is lowered responsive to operation of the draft unit and to slacken the cable and release the apron from open position when the draft unit is operated to raise said frame.

12. In combination, a draft vehicle, a rigid scraper frame, wheels supporting the rear part of said frame, an earth loading, carrying and dumping assembly carried by said frame, a vertically movable draft unit for coupling the forward part of the frame with said draft vehicle and raising and lowering said frame about the axis of said wheels, a cable connected at its ends with the earth handling assembly on said frame and said draft vehicle respectively for controlling the operation of said assembly responsive to the tightening and the slackening of the cable, and means operating to tighten the cable when the frame is lowered by said draft unit and to slacken the cable when the frame is raised by said draft unit.

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