Sept. 15, 1953 W. H. CURRY 2,651,902

STONE COLLECTOR

Filed May 14, 1951 2 Sheets-Sheet 1

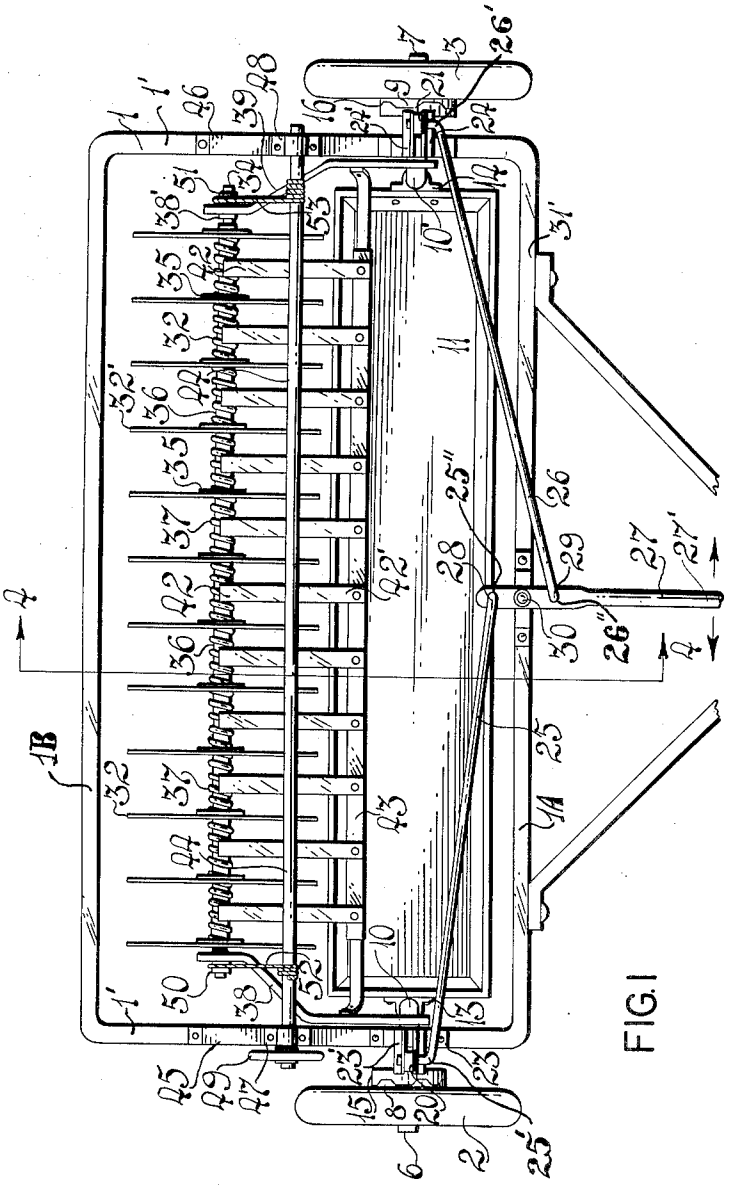


FIG. 1

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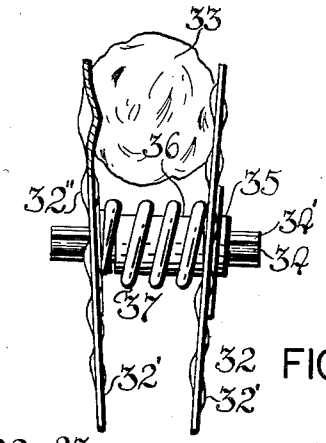


FIG. 2

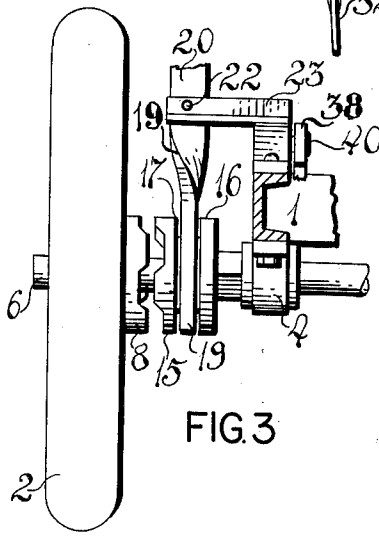


FIG. 3

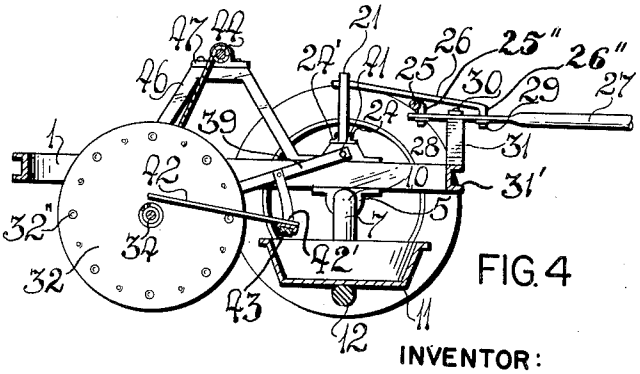


FIG. 4

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STONE COLLECTOR

William H. Curry, Winnipeg, Manitoba, Canada

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In Canada May 11, 1950

1 Claim. (Cl. 55—17)

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My invention pertains to stone collectors, particularly to a stone collector of a tractor trailer type, an object of which is to provide a device of the character herewithin described which collects stones from a field while in motion behind a conventional tractor with draw-bar.

A further object of my invention is to provide a device of the character herewithin described which collects stones of a wide variety of sizes without adjustment or discrimination as to size of the individual stones to be collected.

Another object of my invention is to provide a device of the character herewithin described which embodies a hopper or receiver into which stones are deposited as picked up, and which when full can be emptied by a very simple manipulation by the operator, without, however, necessitating his demounting from the tractor for such purpose.

A still further object of my invention is to provide a device of the character herewithin described which is adjustable for various soil or terrain conditions. That is to say, the stone picking element may be adjusted for terrain which may vary from freshly tilled to unbroken land.

Yet another object of my invention is to provide a device of the character herewithin described which requires only one man for its operation including the operation of the tractor which provides it with mobility.

And a still further object of my invention is to provide a device of the character herewithin described, which is simple and economical to manufacture and operate and which is, moreover, particularly well suited to the purposes for which it is intended.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which—

Figure 1 is a top plan view of the stone collector per se.

Figure 2 is an enlarged fragmentary elevation of a pair of collector discs, a portion of one of which is sectioned and in which view I have depicted the pincer-like action for picking up and retaining a stone.

Figure 3 is an enlarged fragmentary rear elevation of one wheel showing details of the clutch mechanism.

Figure 4 is a longitudinal section of my stone

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collector taken along the line 4—4 in Figure 1.

In the drawings like characters of reference indicate corresponding parts in the different figures.

The stone collector hereinafter to be described is particularly suitable for use in clearing land containing relatively large quantities of stones and the like of widely different dimensions. The disc assembly, details of which will hereinafter be described, contains means whereby the individual discs may be biased or moved apart at the perimeters thereof in order to permit the introduction therebetween of stones considerably larger than the width between any pair of adjacent discs.

This sideways movement of the discs permits the adjacent pairs of the discs to be spaced relatively close together in order to pick up relatively small stones yet still collect considerably larger stones.

Proceeding now to describe my invention in detail, it will be seen that the device is supported upon a rectangular frame 1, formed of a conventional structural shape, such as channel section beam steel and including side members 1' and front and rear members 1A and 1B respectively. This frame is, in turn, itself supported upon a pair of freely rotating pneumatic-tired wheels 2 and 3.

The said wheels 2 and 3 are suspended from the aforementioned frame 1 by two pillow blocks 4 and 5 which are attached to the underside of the frame 1, at a point forward of the centre line, sufficiently off centre to ensure that, even when loaded, the entire device will not tilt forward, and prematurely discharge said load.

Journalled in said pillow blocks 4 and 5, two cylindrical shafts 6 and 7 provide axles for wheels 2 and 3 which are freely rotatable thereon. The inboard hub faces of said wheels are fitted with coarse splined, or toothed, clutch plates 8 and 9 respectively, which are capable of engagement with a corresponding set of clutch plates 15 and 16 to which reference will again be made hereinbelow.

Shafts 6 and 7 are extended inboard after journalling in pillow blocks 4 and 5, a short distance, where ninety-degree bends 10 and 10' are made and the said shafts drop an appropriate distance to support a trough 11 of trapezoidal section, and which is thereby carried on the implement in an underslung position, sufficiently low to add stability but with clearance great enough to permit free movement over rough terrain. The underslung portion 12 of the shaft 7, carries the

said trough 11 and is fixed thereto by means of two brackets 13 and 14 which are either welded or bolted, or riveted as shown, to the trough. This mounting is intended to permit tilting of the trough for the unloading, or discharge of the load, thereof, when the operator so desires.

To facilitate such discharge of load, the following arrangement is provided. Engageable with clutch plates 8 and 9, the two correspondingly toothed clutch plates 15 and 16 to which reference was made hereinbefore, are splined or keyed to the shafts 6 and 7, and are capable of limited endwise movement thereon, so that the two pairs of clutch plates, i. e. 8—15 and 9—16 are normally disengaged. The movable plates 15 and 16 are fabricated in combination with necked portions 17 and backing plates 18. Two fork ends, 19, extensions of levers 20 and 21, freely engage with the neck portion of what I define as the clutch plate assemblies comprising parts 15—17—18, and 16—17'—18' respectively. The said fork ends, 19, are half twisted as at 19' so as to present a larger width for slotting during manufacture of the forks. The levers 20 and 21 are pin-connected by pivot pins 22, to angle bracket sets 23 and 23' and 24 and 24', which are bolted, riveted or welded, to the upper surface of frame 1 immediately above the pillow blocks 4 and 5.

Two connecting rods, 25 and 26, which are provided with angulated bends 25' and 25' respectively near their respective outboard ends are inserted in apertures provided in the upper extensions of levers 20 and 21, and provided with retaining means, to prevent disconnection. The inboard ends are similarly provided with bends 25'' and 26'' respectively retaining means for insertion and retention respectively in apertures contained in the end of an actuating lever arm 27. Midway between these said two connecting points 28 and 29 in lever 27, a third aperture affords pivoting by means of pivot pin 30, which is, in turn, fixed to pivot block 31, bolted or fastened to the forward transverse member 31'. The handle or forward end 27' of actuating lever 27 is extended towards the tractor (not illustrated) so as to be at a point convenient for the operator without necessitating his demounting, or stopping the tractor, for the purpose.

The function of picking up stones is performed by a stone gathering disc assembly collectively designated 32 which includes a plurality of discs 32'. The individual discs are deformed, or provided with a series of dimples 32'' so as to assist in retention of stones or other irregularly shaped objects, such as shown at 33 in Figure 2. These said discs are loosely mounted upon a shaft 34 so that they are free to adjust anglewise from the normally perpendicular. An internally splined collar 35, is attached to each disc and loosely engages with the splining 34' on the shaft 34, permitting the disc to revolve in an eccentric instead of in a plane normal to the shaft centre line, if necessary. The splining ensures that the discs will all revolve while the implement-tractor combination is in motion. The discs are separated from each other by tubular spacers 36 and by coiled compression springs 37, the standing length of which is slightly in excess of the length of the said tubular spacers 36.

The extremities of the disc shaft, 34 are cylindrical, and are supported for rotation by two cantilever arms 38 and 39, which are provided with suitable bearings 38' for said shaft extremities. The aforesaid cantilever arms are pin-connected to the aforementioned angle brackets 23 and 24, by pivot pins, 40 and 41 respectively which thus permit limited rotation of the arms and the disc assembly carried thereby.

A multiplicity of stripper fingers 42 comprising flat strap-shaped strips, are mounted midway between each pair of discs 32. They are suspended from the cantilever arms 38 and 39 by means of a supporting bar 43, the ends of which are bent upwardly and riveted or otherwise fastened to the said cantilever arms 38 and 39, at a point which brings the inner ends 42' of stripper fingers over the edge of the stone receiving trough 11. The supporting bar 43 is slung at an elevation lower than that of disc shaft 34 so that there is a forward inclination of the aforesaid stripper fingers. This insures that the objects collected upon the discs will roll downward into the receiving trough when detached from between the discs by said stripping fingers.

A counter-shaft 44 is mounted upon elevated brackets 45 and 46, which are secured to the upper surface of the frame, to the rear of the main wheel shaft. The said counter-shaft 44 is journalled in two pillow blocks 47 and 48 which are mounted upon the elevated brackets 45 and 46. One end of said shaft 44 is provided with a hand-wheel 49. Two collars 50 and 51 on the extensions of shaft 34, provide rotatable attachments for cables 52 and 53, which extend over to elevated counter-shaft 44, and are wound thereon. Thus manipulation of the hand-wheel 49, enables adjustment to be made of the height of the discs above ground so that the operator may select the best height for the terrain which is to be traversed. Draw-bar attachment truss 54 attached to the frame 1 provides motive power when coupled to a conventional tractor (not illustrated).

The operator then, having made the adjustment just mentioned hereinabove, mounts his tractor and proceeds to traverse the field from which stones are to be collected and gathered. As the discs 32 rotate upon their shaft 34, caused by the traction inherent in their rolling friction with the surface of the field, any object within the range of the implement is picked up when encountered by an adjacent pair of discs. This is performed quite simply as the discs adjust themselves anglewise to the size of the stone, due to their loose fit upon the shaft and the opposing spring action of the intermediate springs upon them. This combination comprises a clutching action by the pair of adjacent discs, and the stone, retained in the deformities provided within the disc sheet, revolves with the disc until the stripping finger 42 is encountered. The clutching action of the two discs is opposed by the said stripping finger and the stone is dislodged and rolls along the upper surface of the stripping finger and drops into the receiving trough 11, the discs once again taking up parallel relationship due to springs 37.

When the trough capacity has been reached, or alternatively when the operator approaches the gathering point and the load is to be discharged, the operator rotates wheel 49 thereby raising the disc assembly 32 as hereinbefore described.

When in the raised position lever 27 is actuated thereby engaging the opposing clutch plates 15 and 16 with plates 8 and 9 respectively. Movement of the assembly either forwardly or rearwardly causes ground-engaging wheels to rotate the trough 11 so that the contents thereof are dumped upon the ground.

Opposite movement of the implement rights the trough whereupon the clutches are disengaged thus permitting the implement to be drawn clear of the dumped stones, the disc assembly 32 being raised above same as hereinbefore described.

The disc assembly is then reset and gathering continued.

Since various modifications can be made in my invention as hereinabove described, and many apparently widely different embodiments of same made within the spirit and scope of the claim without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

What I claim as my invention is:

A stone collector for gathering and collecting stones and the like from the surface of the ground comprising in combination a substantially rectangular framework including two opposing side members and front and rear members, ground-engaging wheels journalled for rotation upon each of said side members of said framework, a stone gathering disc assembly suspended from said framework, a trough also suspended from said framework, parallel to said stone gathering assembly, means connected to said disc assembly and cooperating therewith to disengage stones from said disc assembly and deposit same within said trough, said stone gathering disc assembly including a pair of cantilever

arms pivotally secured at one end thereof to the said side members of said framework, a shaft journalled for rotation between the opposite ends of said arms, a plurality of discs rotatably mounted upon said shaft, spacers separating said discs rotatably mounted upon said shaft, compression springs surrounding said spacers and bearing against adjacent discs so as to permit said discs to deflect within limits from the perpendicular, said means for disengaging stones from said disc assembly including a cross bar spanning said disc assembly and a plurality of fingers extending from said cross bar to a position between adjacent discs, the distal ends of said fingers resting on said compression springs, said cross bar overlying said trough so that stones picked up by adjacent pairs of discs strike said fingers and roll forwardly down said fingers to be deposited in said trough.

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