Dec. 1, 1931. C. E. BALL ET AL 1,834,301

COMBINED SCRAPER AND GRADER

Filed Sept. 28, 1928 2 Sheets-Sheet 1

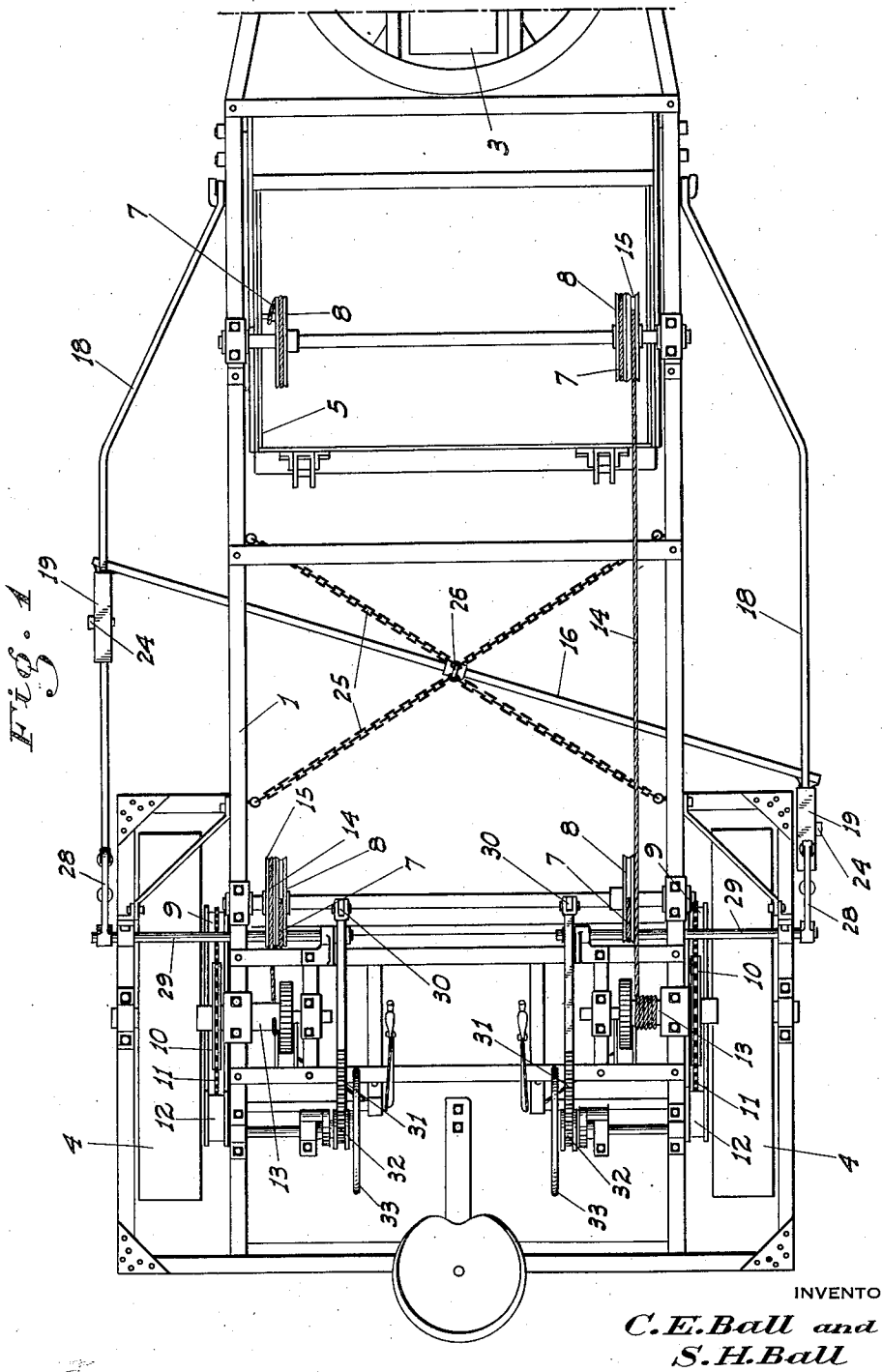


Fig. 1

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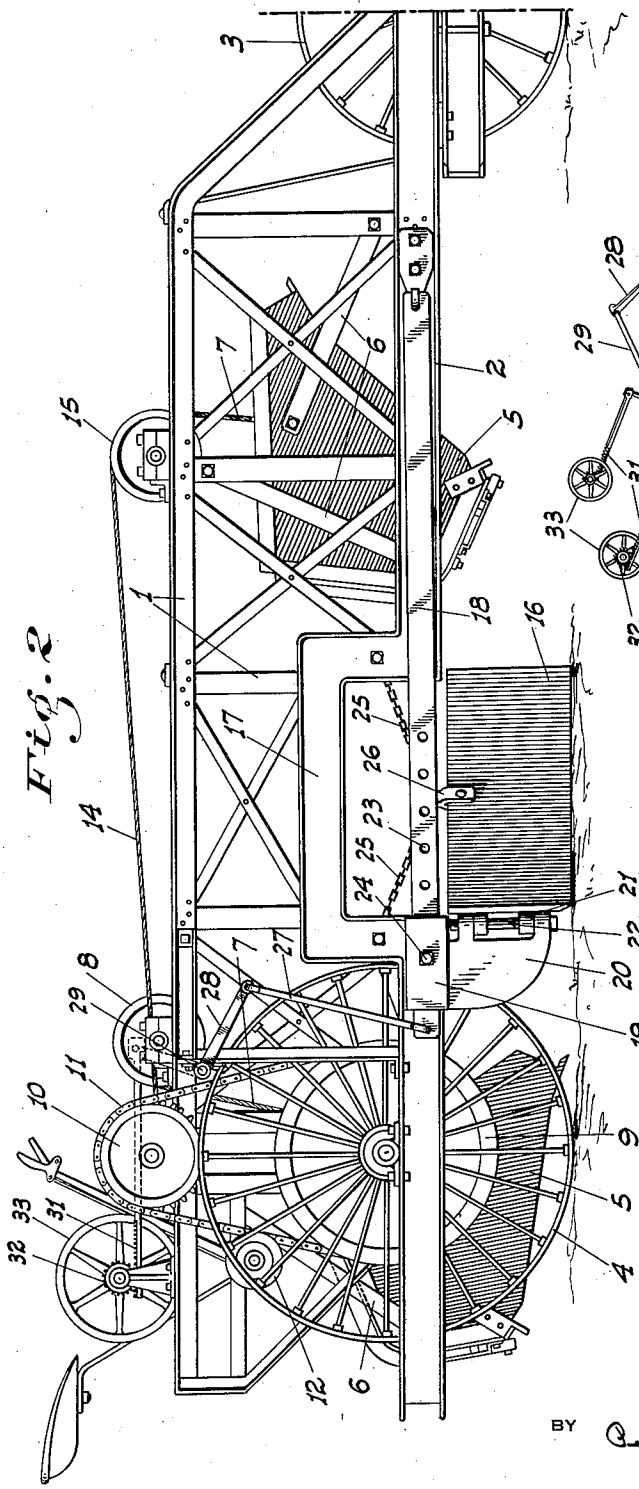


Fig. 2

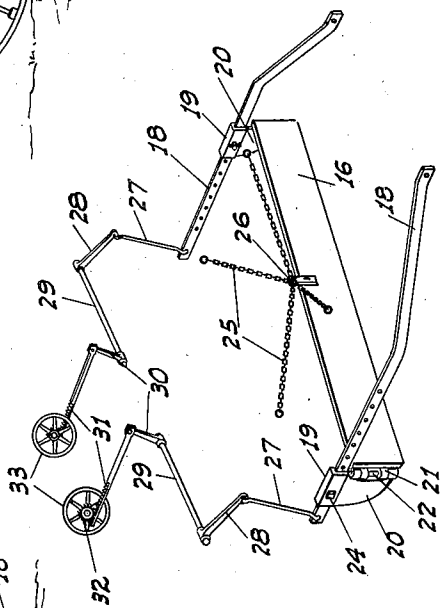


Fig. 3

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Patented Dec. 1, 1931

1,834,301

UNITED STATES PATENT OFFICE

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COMBINED SCRAPER AND GRADER

Application filed September 28, 1928. Serial No. 309,012.

This invention relates to scraping and grading machines, our principal object being to provide as a single combination unit, scraping and dirt conveying bowls and a grading and leveling blade so arranged relative to the bowls as to permit grading, scraping, leveling and dirt removing or conveying operations being carried out simultaneously with the one machine.

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

Fig. 1 is a top plan view of our improved machine.

Fig. 2 is a side elevation of the same.

Fig. 3 is a diagrammatic perspective of the grading blade and its control means detached.

The machine is essentially of the general form shown in our Patent No. 1,675,602, dated January 21, 1928, and comprising a main truss frame structure 1 which includes heavy main side beams 2, the frame being supported at its front end by a swivel wheel 3 and at its rear end by widely spaced wheels 4.

A pair of scraping bowls 5 are mounted between the beams 2 in widely spaced relation lengthwise of the machine, said bowls being hung from links 6 secured to the frame work and from vertically movable cables 7. These cables for the different bowls are secured to separate sets of sheaves 8, the rotation of which and consequently the vertical movement of the bowls, being independently and selectively controlled by the rotation of the wheels 4. Such specific control means forms no part of the present invention, but the preferred construction for each set of sheaves is as follows:

A large sheave 9 is mounted in connection with one of the wheels 4, a sprocket wheel 10 is mounted on the frame above said wheel, and an endless chain 11 passes about said sprocket and sheave; there being a hand control idler sheave 12 for tightening the chain against the sheave 8, in order to cause the chain to be driven and the sprocket wheel to be rotated with the rotation of said wheel and sheave 9. Fixed in connection with the sprocket wheel is a drum 13 about which a cable 14 is wound, said cable extending to a sheave 15 mounted in fixed and concentric relation with the corresponding set of sheaves 8 and being wrapped about the same in the direction opposite to the direction of wrapping of the corresponding cable 7 about the sheave 8.

The form of the bowl and the control means as above described is substantially the same as shown in our Patent No. 1,593,007, dated July 20, 1926, but such shape, mounting, and operating of the bowls may be changed if desired without affecting the essential features of the present invention.

A transversely extending grading blade 16 is disposed intermediate the bowls, and is of a width sufficient to project beyond the planes of the outer edges of the rear wheels. The beams 2 are arched intermediate their ends as at 17 to permit said blade to be raised a considerable distance clear of the ground when not in use. Horizontal draft bars 18 are flexibly connected at their forward ends to the side beams 2 near the forward ends thereof, and pass over the top of the blade near its side edges. At such points said bars slidably pass through sleeves 19 which are formed on the upper ends of substantial hinge members 20, which extend down to adjacent the bottom of the blade at the back. Here, said hinge members cooperate with hinge eyes 21 fixed on the back of the blade, vertical pins 22 passing through the cooperating hinge elements. Each bar is provided with a row of holes 23 toward its rear end to removably receive a pin 24 mounted in the corresponding sleeve and projecting transversely therethrough. The blade is independently connected to the frame structure by diagonally extending chains 25 or similar flexible elements which are secured at one end to the beams 2 and converge to their other ends to a common connection with an eye or ring 26 secured on top of the blade centrally of its length. By means of the foregoing features of construction and mounting of the grading blade, it will be seen that said blade may be set at different angles by altering the setting of the bars in their sleeves, the hinge connec-

tion of the latter with the blade enabling this to be done without setting up any binding action.

All the pull of the blade is taken by the draft bars through the sleeves and the hinge members, the chains 25 being mainly for the purpose of preventing lateral movement of the blade and forming in effect a central pivot for said blade.

The blade may be raised or set at different tilts from end to end by means of links 27 connected to the rear ends of the bars 18 beyond the sleeves, and to radial arms 28 mounted on independent transverse shafts 29, supported by the frame. The shafts are independently and selectively rotated by suitable means, such as other radial arms 30, projecting upwardly from said shafts and connected to longitudinally extending rack-bars 31. These bars are engaged by pinions 32 associated with hand wheels 33 which are mounted in fixed positions on the frame in a location convenient to the operator of the machine. Such specific means of controlling the vertical positioning of the blade however, is not essential to the invention and can be modified in various ways as will be obvious. The positioning of the blade between the two scraper bowls and the separate and independent control means for the blades and bowl enables scraping or grading operations to be carried out independently or simultaneously as may be desired. If the bowls are both raised clear of the ground the blade can function without interference from the bowls. Similarly after the blade is raised the bowls can likewise function without interference from the blade. If it is desired to use the blade for leveling purposes after the dirt has been scraped, the front bowl alone is used to scrape and convey such dirt and then deposit it at the proper place in the path of the blade, which is then lowered sufficiently to level off the deposited dirt to the desired height, or set so as to shove the dirt forward to fill in any low places in the area being worked on.

Or again the front bowl may be raised out of the way, the blade positioned to level off any humps in its path, and the rear bowl then used to gather up the dirt thus leveled, after the blade has been raised.

It will therefore be seen that by suitable manipulation of the blade and bowls, scraping and grading and similar operations may be carried out with one movement of the machine along the ground, thereby effecting a great saving of time and labor otherwise used when the operations have to be performed by separate machines moving over the same stretch of ground at different times.

From the foregoing description it will be readily seen that we 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 departure from the spirit of the invention, as defined by the appended claims.

Having thus described our invention what we claim as new and useful and desire to secure by Letters Patent is:

1. A ground working implement including a frame adapted to travel along the ground, a bowl to collect dirt mounted in connection with the frame, and a vertically adjustable leveling element supported from the frame ahead of the bowl whereby dirt engaged and piling up ahead of the element with the forward movement of the implement may, upon raising the element, be received into the bowl with the further forward movement of the implement.

2. A ground working implement including a pair of longitudinally spaced bowls adapted for dual or individual use, and a ground working instrumentality between the bowls adapted to be brought into play to cooperate with the functioning of either bowl.

3. A grading and leveling structure comprising as a unit, a bowl to convey and deliver a load of dirt to an area to be graded and leveled, a blade to spread and level such dirt, and another bowl to receive any excess dirt remaining after the area has been graded to a predetermined level.

4. In an earth working implement, a transverse leveling blade, a horizontal frame above the blade, elements substantially inclined to the horizontal radiating forwardly and laterally from the blade to the frame and flexibly connected to the frame and to the blade on top and centrally of its length and means to tilt the blade in a transverse vertical plane or to raise the same parallel to a transverse horizontal plane selectively.

In testimony whereof we affix our signatures.

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