Nov. 17, 1925. 1,561,694

B. C. CLUTTER

SCOOP ATTACHMENT FOR POWER OPERATED EXCAVATING APPARATUS

Original Filed May 26, 1923 2 Sheets-Sheet 1

Fig 2

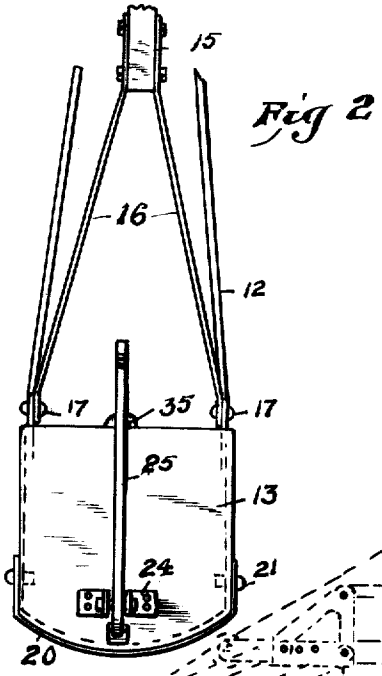
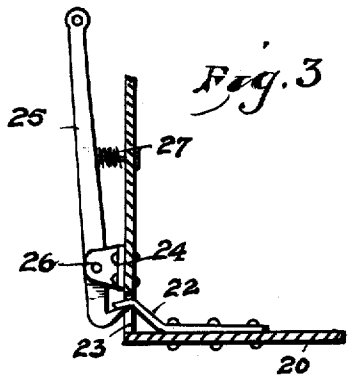
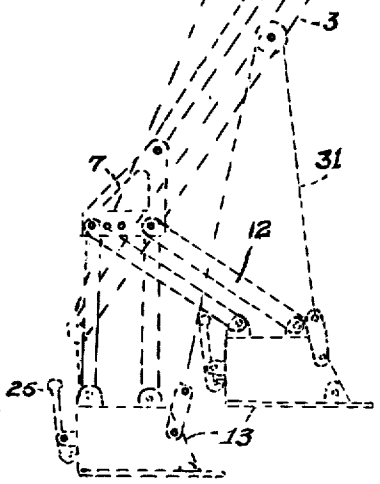


Fig. 1

Fig. 3





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Fig. 4

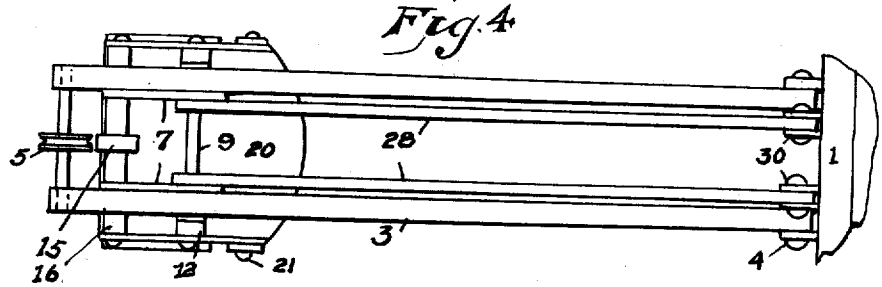


Fig 5

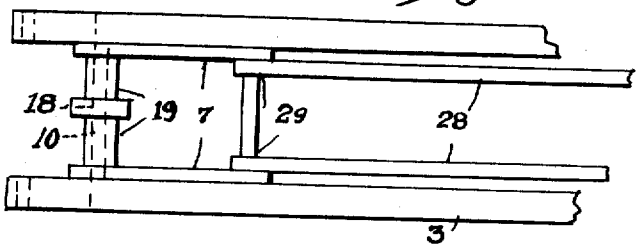
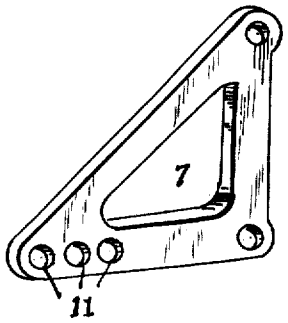


Fig 6



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UNITED STATES PATENT OFFICE.

BIRD C. CLUTTER, OF AKRON, OHIO.

SCOOP ATTACHMENT FOR POWER-OPERATED EXCAVATING APPARATUS.

Application filed May 26, 1923, Serial No. 641,532. Renewed April 18, 1925.

To all whom it may concern:

Be it known that I, BIRD C. CLUTTER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Scoop Attachments for Power-Operated Excavating Apparatus, of which the following is a specification.

This invention relates to new and useful improvements in scoop attachments used in connection with power operated excavating or ditching apparatus, and important objects of the invention are to provide a scoop attachment of the class stated, which will operate automatically to adjust the scoop relatively to the boom of the apparatus during the ditching operation and while the boom is shifting vertically to the dumping position; which positions the scoop to operate at a comparatively large arc thereby maintaining the point of the scoop in the cutting position, as the pull of the scoop cable is always toward the open end of the scoop, thus preventing dragging of the scoop at the start and finish of the cut as experienced in the ordinary type of ditching apparatus; which will operate to leave a finished uninterrupted ditch bottom; and which may be readily attached to a ditching apparatus of the usual construction.

Further objects of the invention are to provide a device of the character described in a manner hereinafter set forth which will function to jiggle the closed end of the scoop during the scooping or ditching operation thereby facilitating the passage of the scoop through the materials to be removed and greatly expediting the operation of the apparatus; which permits of the use of the weight of the boom for forcing the scoop into the work during the scooping operation whereby capacity performance of the apparatus is maintained; which is simple in its construction and arrangement, strong, adjustable, durable and efficient in its use, and comparatively inexpensive to manufacture, install and operate.

To the accomplishment of these and such other objects as may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts herein specifically described and illustrated in the accompanying drawings wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modification may be resorted to which come within the scope of the claims hereunto appended.

In the drawings forming a portion of this specification and wherein like numerals of reference designate corresponding parts throughout the several views:—

Figure 1 is a fragmentary side elevation of a ditching or excavating apparatus provided with a scoop and attachment therefor in accordance with my invention, and illustrating various operating positions of the scoop and attachment device in dash lines.

Figure 2 is an end view of the closed outer end of the scoop and associated parts.

Figure 3 is an enlarged detail view illustrating the latching element for the scoop.

Figure 4 is a top plan view of my improved attachment device and the scoop, associated with boom members in the elevated position.

Figure 5 is a similar view with the scoop removed therefrom and with portions of the boom members and actuating bars broken away.

Figure 6 is a perspective view of one of the bell crank hanger elements.

Referring in detail to the drawings 1 denotes the frame structure of a power operated portable ditching or excavating apparatus constructed in the usual manner and swivellingly supported on a suitable truck 2.

A pair of outwardly projecting boom members 3 are pivotally connected, as at 4, to the lower end portion of the frame structure 1 to allow of their vertical movement to the operating positions to be described. The boom members 3 are spaced from each other and extend parallel with respect to each other. The free or outer ends of the boom members 3 carry a pulley 5 which is mounted on the transversely extending shaft 6, suitably journaled in respective ends of the boom members 3.

Each of the boom members 3, adjacent to its outer end, carries a bell crank hanger 7 having its fulcrum 8, at transversely aligned points, on the inner face of respective boom members 3. The bell crank hangers 7 are connected together at their upper ends by a transversely extending shaft 9. The outer ends of the bell crank hangers 7 are like-

wise connected together by a transversely disposed detachable shaft 10. The outer end of each of the bell crank hangers 7 is provided with a series of bearing apertures 11. The bearing apertures of one bell crank hanger are transversely aligned with respect to the bearing apertures of the other bell crank hanger, to permit of the adjustment of the shaft 10 in the bearing apertures for the purpose to be described.

A pair of hanger arms 12 carries the open end of the scoop 13. The upper ends of each of the hanger arms 12 is pivotally connected to a boom member 3 at the fulcrum point 8 of respective bell crank hangers 7. It will be noted that while the fulcrum of the bell crank hangers 7 is on the inner face of the boom members 3 the upper ends of the hanger arms 12 are directly opposed and are pivotally connected to the outer face of the boom members 3. The lower ends of the hanger arms 12 are pivotally connected, as at 14, to the upper end of the scoop 13, adjacent to the inner open end thereof.

The outer closed end of the scoop 13 is supported by a hanger arm 15 having its lower end provided with a yoke 16, which latter has its lower ends pivotally connected, as at 17, to the upper end of the scoop 13 adjacent to the outer end thereof. The upper end of the hanger arm 15 is pivotally connected, as at 18, to the shaft 10, and is maintained centrally thereof by a pair of sleeves 19 mounted on the shaft 10 on respective sides of the hanger arm connection 18.

The dumping bottom 20 of the scoop 13, is preferably rounded, and is pivoted, as at 21, at its inner end to the body portion of the scoop 13.

The inner portion of the scoop bottom 20 carries a centrally disposed projecting catch 22 which extends into the slot 23, provided therefor in the lower marginal edge of the scoop end wall, when the bottom is in the closed position. The scoop end wall further carries a bearing bracket 24 in which a latching member 25 is pivotally supported, as indicated at 26. The lower end of the latch member 25 is adapted to engage the catch 22 and lock the bottom 20 in the closed position. The upper end of the latch member 25 is adapted to be connected with an operating line for releasing the latch member 25 to effect the dumping operation.

A spring member 27 having one end secured to the scoop end wall, and the other end thereof to the latch member 25, is provided for normally forcing the latter to the locking position.

A pair of actuating bars 28 connects the bell crank hangers 7 with the frame structure of the ditching apparatus. Each of the bars 28 has its outer end pivoted, as at 29, to the transverse shaft 9 adjacent to respective bell crank hangers 7, and each has its inner end pivotally connected, as at 30, to the frame structure 1.

During the ditching operation the scoop 13 is drawn inwardly toward the apparatus by means of a scooping cable 31, having one end thereof connected to the hitching member 32 which latter is pivoted to the inner open end of the scoop 13. The scooping cable 31 passes over the sheave 33, suitably journaled in the boom members 3, and is operated by a controlling drum of the ditcher apparatus.

The boom members 3 and associated parts are shifted vertically by the operation of the boom hoisting cable 34 which is connected, as at 35, to the center of top marginal edge of the scoop end wall and passes over the pulley 5 carried on the forward end of the boom members 3. The hoisting cable 34 is controlled by the operation of the hoisting drum of the apparatus. During the elevating operation the scooping cable 31 is controlled at will by the operator to maintain the scoop 13 suspended vertically or in any other position desired.

It will be noted that the distance between the pivotal connection 4 of the boom members 3, and the pivotal connection 30 of the actuating bars 28, is commensurate to the distance between the fulcrum point 8 of the bell crank hangers 7, and the pivotal connection 29 of actuating bars 28 with the transverse shaft 9. Under such arrangement the position of the bell crank hangers 7 will not vary regardless of angular disposition of the boom members 3 during the ditching or dumping operation. In other words, the shaft 10, carrying the hanger arm 15, will at all times maintain its horizontal alignment relatively to fulcrum point 8 of the bell crank hangers 7, while the shaft 9 to which the actuating bars 28 are connected will always maintain its vertical alignment relatively to the fulcrum point 8 of the bell crank hangers 7.

By the automatic adjustment of the bell crank hangers 7, by the operation of the actuating bars 28 as above described, the cutting edge of the scoop 13 will always maintain a cutting position even at the start and finish of the cut and allow of the construction of a ditch without the usual sinuated bottom. The adjustment of the transverse shaft 10 in respective bearing apertures 11 of the bell crank hangers 7, provides for variable operating conditions found in practice relative to the sweep of the scoop and the depth of the excavation. The continual vacillation of the boom members 3 during the scooping operation will transmit a similar movement to the actuating bars 28, whereby the bell crank hangers 7 will operate to jiggle the outer closed end of scoop 13, causing the latter to be drawn through the ma-

terial with comparative ease, thereby facilitating and expediting the performance of the apparatus.

When the hanger arm 15 is connected with the bell crank hangers 7 so as to extend in parallel relation with the hanger arms 12, as illustrated in Figure 1, of the drawings, the scoop bottom 20 will always maintain a horizontal position during the operation of the device. However, if the hanger arm 15 and the hanger arms 12 do not extend in parallel relation with each other, the angular disposition of the scoop bottom 20 will vary during the scooping operation.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims. The term "inclination" used herein is intended in its broadest sense to mean at angles from 0° upward so as to include positioning the shovel horizontally or at various inclinations depending upon the character of the work being done.

What I claim is:—

1. In a power operated excavating apparatus, a shiftable scoop, a shiftable boom having its lower end pivotally connected with the body of the apparatus, a hanger means pivoting on a support carried by the boom below the top thereof, a forward hanger element pivotally connected respectively to the scoop and with said means, rear hanger elements pivotally connected to the scoop and to said support, and an actuating device pivotally connected with the body of the apparatus and to said means for shifting the latter on said support to maintain the scoop horizontal, during the shifting of the latter.

2. In a power operated excavating apparatus, a shiftable boom having its lower end pivotally connected with the body of the apparatus, a hanger means pivoting on a support carried by the boom below the top thereof, a forward hanger element pivotally connected respectively to the scoop and with said means, rear hanger elements pivotally connected to the scoop and to said support, and an actuating device pivotally connected with the body of the apparatus and to said means for shifting the latter on said support to maintain the scoop horizontal during the shifting of the latter.

3. In a power operated excavating apparatus a shiftable scoop, a shiftable two-part boom having its lower portion pivotally connected to the body of the apparatus, a hanger means arranged within the boom and pivoting on a support secured to the boom below the top thereof, a front hanger element pivotally connected to the scoop and to said means, rear hanger elements pivotally connected to the scoop and to said support, and a pair of actuating arms arranged above the boom and pivotally connected at their lower ends to the body of the apparatus and at their upper ends to said means for shifting the latter on said support to maintain the scoop horizontal during the shifting of the latter.

4. In a power operated excavating apparatus, a shiftable boom, a pair of triangular shaped opposed hangers having the lower rear corners pivotally supported on the boom below the top thereof, a pair of shiftable actuating arms arranged above the boom and each having its upper end pivotally connected to the upper rear corners of a hanger, a shiftable scoop, a pair of hanger arms pivotally connected with the open end of the scoop and with said boom, and a hanger element pivotally connected with the forward corners of said hangers and with the closed end portion of the scoop.

5. In a power operated excavating apparatus, a support adapted to be carried by the boom of the apparatus, a shiftable triangular shaped hanger means pivotally mounted on said support, a shifting means for and pivotally connected to said hanger means, a scoop suspension element pivotally connected to hanger means, and a pair of scoop suspension elements arranged rearwardly of said element and pivotally connected to said support.

6. In a power operated excavating apparatus, a support adapted to be carried by the boom of the apparatus, a shiftable triangular shaped hanger means pivotally mounted on said support, a shifting means for and pivotally connected to said hanger means, a scoop suspension element pivotally connected to hanger means, and a pair of scoop suspension elements arranged rearwardly of said element and pivotally connected to said support, a shiftable scoop, and means for pivotally connecting said elements to said scoop at the front and rear thereof.

7. In a power operated excavating apparatus, the combination with a boom pivoted at its lower end with the body of the apparatus, and a pair of triangular shaped hangers arranged within the boom at a point removed from the upper end thereof, of a shaft extending through the lower opposed rear corners of the hangers and through the boom and upon which pivots the hangers, a pair of actuating arms pivotally connected at their lower ends with said body and extending between the hangers, means for pivotally connecting the upper ends of said arms to the upper opposed rear corners of the hangers, a scoop, a pair of rear suspension elements pivoting on said shaft and pivotally connected to the scoop, a shaft connecting the forward corners of the hangers together and a suspension element pivoting on the last mentioned shaft and pivotally connected to the scoop.

8. In a power operated excavating apparatus, the combination with a boom pivoted at its lower end with the body of the apparatus, and a pair of triangular shaped hangers arranged within the boom at a point removed from the upper end thereof, a shaft extending through the lower opposed rear corners of the hangers and through the boom and upon which pivots the hangers, a pair of actuating arms pivotally connected at their lower ends with said body and extending between the hangers, means for pivotally connecting the upper ends of said arms to the upper opposed rear corners of the hangers, a scoop, a pair of rear suspension elements pivoting on said shaft and pivotally connected to the scoop, a shaft connecting the forward corners of the hangers together and a suspension element pivoting on the last mentioned shaft and pivotally connected to the scoop, and said hangers having means to provide for adjustably positioning said last mentioned shaft.

9. In a power operated excavating apparatus, the combination with a boom pivoted at its lower end with the body of the apparatus, and a pair of triangular shaped hangers arranged within the boom at a point removed from the upper end thereof, of a shaft extending through the lower opposed rear corners of the hangers and through the boom and upon which pivots the hangers, a pair of actuating arms pivotally connected at their lower ends with said body and extending between the hangers, means for pivotally connecting the upper ends of said arms to the upper opposed rear corners of the hangers, a scoop, a pair of rear suspension elements pivoting on said shaft and pivotally connected to the scoop, a shaft connecting the forward corners of the hangers together and a suspension element pivoting on the last mentioned shaft and pivotally connected to the scoop, and rear suspension elements pivoting exteriorly of the boom, and said forward suspension element having its upper terminal pivoting between said hangers and the lower terminal pivoting exteriorly of the boom.

10. In a power operated excavating apparatus, the combination with a boom pivoted at its lower end with the body of the apparatus, and a pair of triangular shaped hangers arranged within the boom at a point removed from the upper end thereof, of a shaft extending through the lower opposed rear corners of the hangers and through the boom and upon which pivots the hangers, a pair of actuating arms pivotally connected at their lower ends with said body and extending between the hangers, means for pivotally connecting the upper ends of said arms to the upper opposed rear corners of the hangers, a scoop, a pair of rear suspension elements pivoting on said shaft and pivotally connected to the scoop, an elevating and lowering cable for the scoop, travelling over the outer end of the boom, a shifting cable for the scoop extending between the boom and the actuating arms, and a dumping cable for the scoop extending between said elements and through the boom and actuating arms.

11. In a device of the class described, the combination with a boom pivoted to swing in a vertical plane, a shovel carried by the boom, link connections between the shovel and the boom, and means carried by the boom for automatically adjusting the link connections thereon by movement of the boom to hold the shovel at a determinate relative position with respect to the horizontal.

12. In a device of the class described, the combination with a boom pivoted to swing in a vertical plane of a shovel suspended from the boom by parallel links, and means for automatically adjusting the links by movement of the boom to hold said shovels in a horizontal plane.

13. In a device of the class described, the combination with a boom pivoted to swing in a vertical plane of a shovel suspended from the boom by links secured at spaced points forwardly and rearwardly on said shovel and arranged substantially in parallelism, said links being relatively adjustable out of parallelism to vary the inclination of said shovel from the horizontal, and means for simultaneously adjusting the links by movement of the boom substantially to maintain an adjusted position of the shovel relative to the horizontal in all positions of the boom.

14. In a device of the class described, a boom pivoted to swing in a vertical plane, a shovel carried by the boom and rigid means connecting the shovel with the boom adapted to be operated by movement of the boom to maintain the shovel substantially in one position relative to the horizontal in all positions of the boom.

15. In a device of the class described, a pivoted boom movable in a vertical plane, a shovel, rigid means carried by the boom on which said shovel is suspended, and means actuated by movement of the boom for operating said rigid means to maintain the shovel at the same inclination with respect to the material acted upon throughout movement of the boom during the operation of crowding the shovel into the material.

16. In a device of the class described, a pivoted boom, a shovel carried thereby, and an element actuated by movement of the boom for maintaining the shovel at a uniform inclination regardless of the inclination of the boom.

17. In a device of the class described, a pivoted boom, a shovel pivotally suspended

from the boom, means for swinging the shovel relatively to the boom to effect a crowding action of the shovel, means for elevating and lowering the boom, and means controlling the inclination of the shovel automatically operated by movement of the boom and also operated by the shovel swinging means to maintain the shovel at a uniform inclination in all of its positions.

18. In a device of the class described, a boom pivoted for movement in a vertical plane, an element carried by the boom, a shovel suspended from the element, and means connected to the element and actuated by movement of the boom for maintaining said element in a uniform relation with respect to the horizontal during movement of the boom.

19. In a device of the class described, a shovel, a boom pivoted for movement in a vertical plane for actuating the shovel, means suspending the shovel from said boom, a second means independent of the boom for actuating the shovel, means carried by the boom for actuating the suspending means to maintain the shovel at a uniform inclination, said suspending means being operable independently by actuation of said second means to maintain the shovel at a uniform inclination.

20. In a device of the class described, a shovel, a boom pivoted to swing in a vertical plane, means connecting the shovel and boom and hingedly connected to each, means carried by the boom adapted to actuate said first means as the boom is elevated or lowered to maintain the shovel at a uniform inclination, said first means being adapted to be actuated to maintain said shovel at said uniform inclination independently of second-named means when the boom is not being moved.

21. Apparatus of the class described, including a relatively fixed support, a pair of elements hingedly connected to said support and to a third element, a second pair of elements hingedly connected to the third element, and a shovel hingedly suspended on said second pair of elements, whereby movement of one of the elements of the first pair will readjust all the elements to maintain the shovel at a uniform inclination with respect to said fixed support.

In testimony whereof I affix my signature.

BIRD C. CLUTTER.

from the boom, means for swinging the shovel relatively to the boom to effect a crowding action of the shovel, means for elevating and lowering the boom, and means controlling the inclination of the shovel automatically operated by movement of the boom and also operated by the shovel swinging means to maintain the shovel at a uniform inclination in all of its positions.

18. In a device of the class described, a boom pivoted for movement in a vertical plane, an element carried by the boom, a shovel suspended from the element, and means connected to the element and actuated by movement of the boom for maintaining said element in a uniform relation with respect to the horizontal during movement of the boom.

19. In a device of the class described, a shovel, a boom pivoted for movement in a vertical plane for actuating the shovel, means suspending the shovel from said boom, a second means independent of the boom for actuating the shovel, means carried by the boom for actuating the suspending means to maintain the shovel at a uniform inclination, said suspending means being operable independently by actuation of said second means to maintain the shovel at a uniform inclination.

20. In a device of the class described, a shovel, a boom pivoted to swing in a vertical plane, means connecting the shovel and boom and hingedly connected to each, means carried by the boom adapted to actuate said first means as the boom is elevated or lowered to maintain the shovel at a uniform inclination, said first means being adapted to be actuated to maintain said shovel at said uniform inclination independently of second-named means when the boom is not being moved.

21. Apparatus of the class described, including a relatively fixed support, a pair of elements hingedly connected to said support and to a third element, a second pair of elements hingedly connected to the third element, and a shovel hingedly suspended on said second pair of elements, whereby movement of one of the elements of the first pair will readjust all the elements to maintain the shovel at a uniform inclination with respect to said fixed support.

In testimony whereof I affix my signature.

BIRD C. CLUTTER.

Certificate of Correction.

It is hereby certified that Letters Patent No. 1,561,694, granted November 17, 1925, upon the application of Bird C. Clutter, of Akron, Ohio, for an improvement in "Scoop Attachments for Power-Operated Excavating Apparatus," were erroneously issued to the inventor, said "Clutter," whereas said Letters Patent should have been issued to the inventor, said *Clutter, and one-third to Leroy P. Clutter, of Washington, Pa., and one-third to George E. Wagner, of Beaver Falls, Pa.*, jointly as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of January, A. D. 1926.

[SEAL.]

WM. A. KINNAN,
Acting Commissioner of Patents.

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