J. HOOD.

EXCAVATING MACHINE.

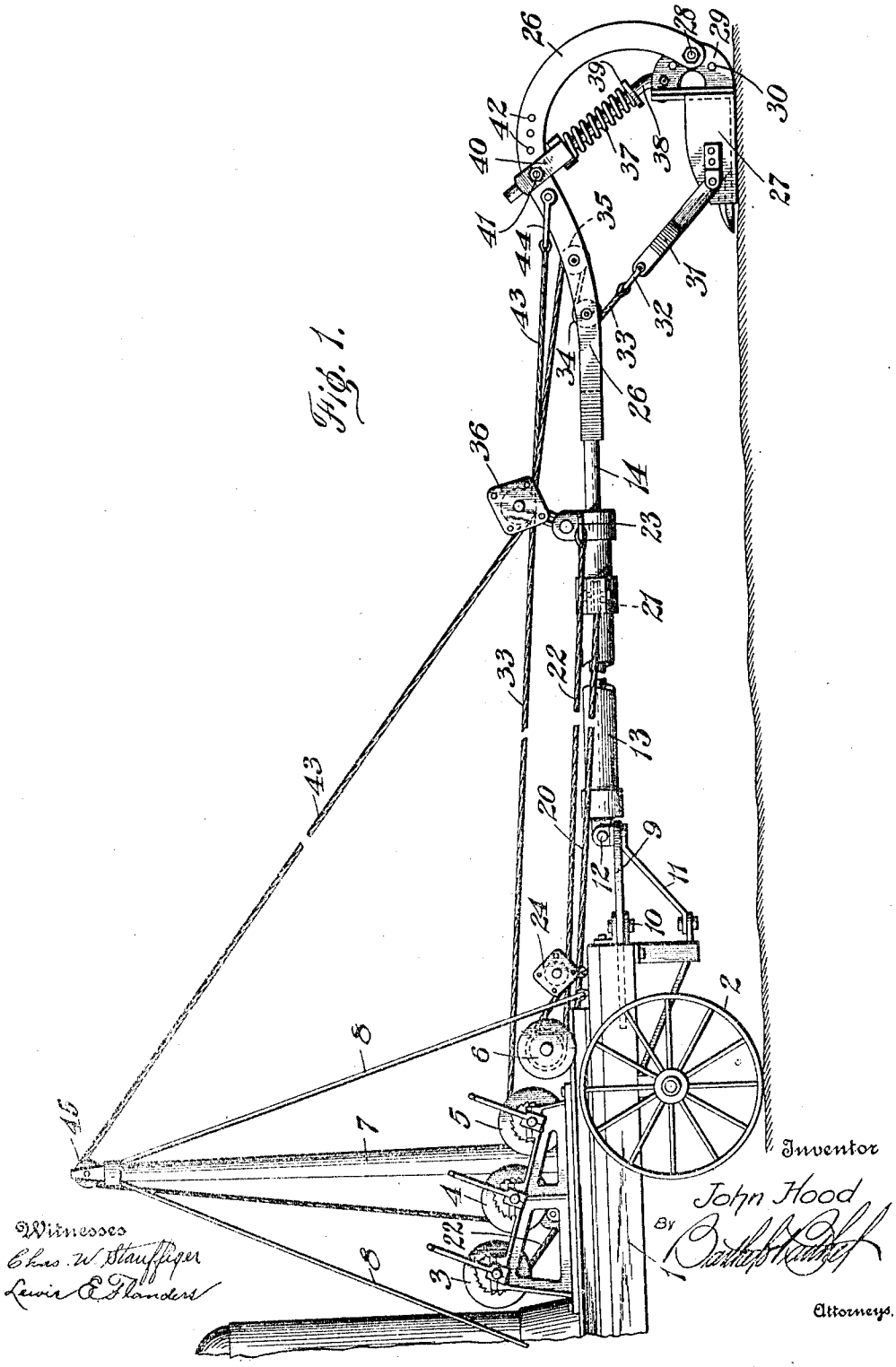
APPLICATION FILED APR. 22, 1911.

1,020,504.

Patented Mar. 19, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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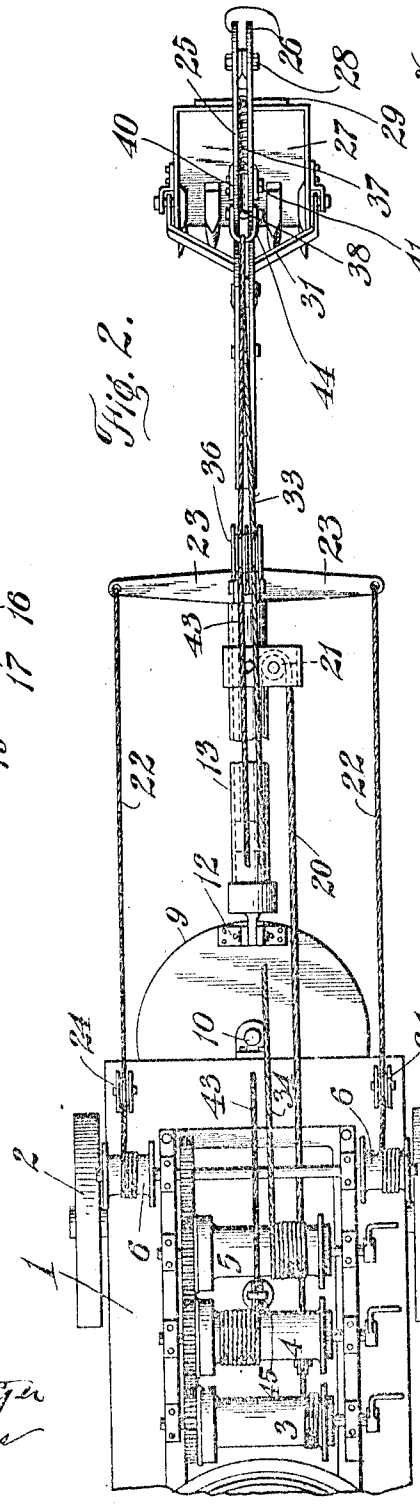

Fig. 2.

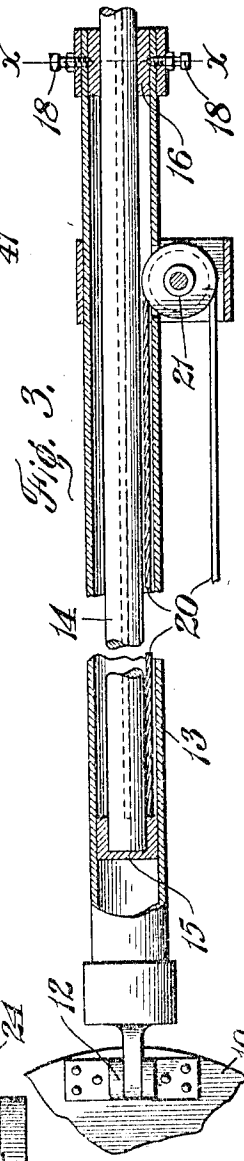

Fig. 3.

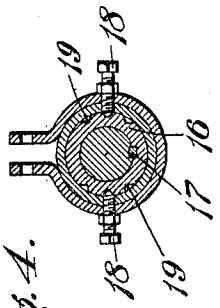

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN HOOD, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO JAMES PITTON, OF DETROIT, MICHIGAN.

EXCAVATING-MACHINE.

1,020,504. Specification of Letters Patent. Patented Mar. 19, 1912.

Application filed April 22, 1911. Serial No. 622,662.

To all whom it may concern:

Be it known that I, JOHN HOOD, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Excavating-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in excavating machines and its object is to provide a simple and efficient device for the purpose which is adapted to be mounted upon a truck so that the same may be readily moved from place to place and positioned as desired.

To this end the invention consists in the matters hereinafter set forth and more particularly pointed out in the claims reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying the invention; Fig. 2, a plan view of the same; Fig. 3, an enlarged sectional detail of the boom; and Fig. 4, a cross section of the same on the line *x*—*x* of Fig. 3.

As shown in the drawings 1 is the rear end of the platform of a suitable truck or wagon having rear supporting wheels 2 and mounted upon the platform 1 is any suitable motor for supplying power to turn a series of winding drums or spools 3, 4, 5 and 6 of any suitable construction and arrangement. A mast 7 is erected upon the platform adjacent to the winding drums and held in vertical position by suitable guy lines 8.

At the extreme rear end of the platform is pivotally supported a turn-table or disk 9 having an axial pivot 10 upon which it turns and a suitable supporting brace 11. Pivotally attached at 12 to the disk is one end of a tubular boom 13 in which is arranged to slide freely, an extension boom 14 of considerably less diameter than the internal diameter of the tubular boom. A head 15 on the extension boom forms a guide for the inner end thereof sliding freely within the tubular boom and in the outer end of the tubular boom is a bushing 16 forming a bearing through which the extension boom slides freely. The extension boom is prevented from turning within the bushing by means of a gib or key 17 carried by the bushing and engaging a slot or keyway in the extension boom. The bushing 16 is adjustably held within the end of the tubular boom by means of set screws 18 engaging a series of notches 19 in the face of the bushing so that by loosening the set screws the bushing together with the extension may be turned and held in an adjusted position by a reëngagement of the set screws with other notches of the series.

The extension boom 14 is projected from the tubular boom by means of a line 20 attached at one end to the head 15 of the extension boom and passing outward within the tubular boom to near the outer end thereof, is extended through an opening in the tubular boom and over a sheave 21 carried thereby. The opposite end of the line is passed around the winding drum 3 to be wound thereon in projecting the boom. The boom is swung laterally, turning upon the axis pin 10 of the disk 9, by means of side lines 22 attached at one end to laterally extending cross arms 23 secured to the extreme outer end of the tubular boom, said lines extending toward the winding mechanism beneath the blocks 24 attached to the platform 1 and wrapped around the drums or spools 6 to be wound thereon, one of the lines being wound around one spool in one direction and the other line being wound in an opposite direction around the other spool so that when the spools are turned one line will be wound up and the other line simultaneously paid out.

Secured to the extreme outer end of the extension boom 14 is a goose-neck 25 comprising two flat parallel bars 26 spaced apart to form a guide slot between them. A shovel or scraper 27 of any suitable form is pivotally attached to the free end of the goose-neck by means of a pivot pin or bolt 28 passing through openings in the ends of the bars 26 and through an opening in a plate 29 secured to the rear end of the shovel. A series of holes 30 is provided in the plate 29 to receive the pin 28, said holes being arranged in a semi-circular row and thus the heel of the shovel may be raised or lowered in relation to the goose-neck by adjusting the pin 28 in this series of holes.

To hold the shovel in raised position relative to the goose-neck so that the dirt thereon will not fall off when the boom is raised, and to permit the shovel to drop,

turning upon its pin 28 to discharge the dirt, a bail 31 is pivotally attached to the sides of the shovel near its forward end and attached to this bail by means of a shackle 32 is a line 33 which passes upward and over a sheave 34 journaled between the bars 26 of the goose-neck near the inner end thereof, and then outwardly around a second sheave 35 similarly supported between the bars. From the sheave 35 the line extends forwardly to the winding drum 5 in engagement with a suitable double block 36.

The shovel is yieldingly held turned upon its pivot 28 in the direction opposite to that in which it is turned by the bail 31, by means of a coiled spring 37 sleeved upon a rod 38 between a head 39 on the rod and a yoke 40 thereon. The rod is pivotally attached at one end to the upper end of the plate 29 on the shovel and extends upwardly between the bars 26 of the goose-neck which bars form a guide for the rod. The yoke 40 embraces the goose-neck and is adjustably attached thereto by means of a pin or bolt 41 passing through the yoke and adapted to engage a series of holes 42 in the goose-neck. The spring 37 is thus held in compression between the yoke 40 and the head 39 on the rod and exerts a force tending to swing the shovel upon its pivot 28 downward. The shovel is thus yieldingly held turned against the lift of the bail 31, and by adjusting the yoke 40 along the goose-neck by means of the holes 42 the tension of the spring 37 may be adjusted.

The boom with its attached goose-neck and shovel is raised by means of a line 43 attached by means of a shackle 44 to the goose-neck and extended beneath the block 36 upward and over a sheave 45 carried upon the extreme upper end of the mast 7. From the sheave 45 the line extends downward and around the winding drum 4.

In the operation of the machine, the line 33 is first slackened permitting the spring 37 to turn the shovel downward into a vertical position. The extension boom is then projected the desired distance by winding up the line 20 and at the same time letting out an equal amount upon the line 43, the boom being supported during such outward movement by said line. When the boom has been projected the desired distance, the line 43 is quickly slackened permitting the boom to fall and drive the shovel into the ground, said shovel being in a vertical position. The line 33 is then wound upon its drum turning the shovel 27 into position to carry its load and retracting the extension boom. When the boom has been fully retracted it is then raised by means of the line 43 and swung laterally in either direction by means of the lines 22 to the position where it is desired to dump the load. When in dumping position the line 33 is slackened, permitting the shovel to turn to a vertical position and discharge its load.

The extension boom may be turned in the tubular boom and held in the position to which it is turned by the set screws 18 engaging the notches in the collar 16. The shovel may, therefore, be tilted or turned laterally where it is desired to have the shovel engage the earth at some other angle than in a horizontal position as in forming a rounding bottom of a ditch or cutting or undercutting a wall of earth.

Having thus fully described my invention what I claim is:

1. In an excavating machine, the combination of an extension boom adapted to turn upon its longitudinal axis, a downwardly curved goose-neck on the outer end of said boom, a shovel attached to the end of said goose-neck at one side of the longitudinal axis of the boom and adapted to be swung laterally by turning the boom, means for holding the boom in the position to which it is turned, and means for actuating the boom to operate the shovel.

2. In an excavating machine, the combination with a truck, power winding mechanism carried by said truck, a vertical mast on the truck, a member pivotally carried by the truck to turn upon a vertical axis, an extensible boom pivotally attached to said member, a goose-neck on the outer end of the boom, a shovel pivotally attached at its rear end to the goose-neck with its forward end toward the truck, a line for turning the shovel leading to the winding mechanism, a spring for turning the shovel against the action of said line, and lines attached to the boom and leading to the winding mechanism for projecting and retracting the boom.

3. In an excavating machine, the combination of a truck, a boom pivotally attached at one end to the truck, a shovel pivotally attached at its rear end to the boom, a line attached to the forward end of the shovel to swing the same upwardly on its pivot, and a spring carried by the boom and acting upon the shovel to turn the same upon its pivot in a direction opposite to that in which it is turned by the line.

4. In an excavating machine, the combination of a boom, a goose-neck secured to the outer end of the boom, a shovel pivotally attached at its rear end to the end of the goose-neck, a bail pivotally attached to the forward end of the shovel, a line attached to the bail to turn the shovel upon its pivot in one direction, a rod pivotally attached to the shovel near its rear end and adjustably connected to the goose-neck at its opposite end, and a spring sleeved on the rod exerting a force to turn the shovel upon its pivot.

5. In an excavating machine, the combi-

nation of a boom, a goose-neck on the outer end of the boom, a shovel pivotally attached at its rear end to the end of the goose-neck, a line attached to the forward end of the shovel to turn the same upon its pivot, a rod pivotally attached to the rear end of the shovel and provided with a head, a yoke through which the rod is adapted to slide, said yoke being adjustably attached to the goose-neck, and a coiled spring sleeved upon the rod between the yoke and the head on the rod.

6. In an excavating machine, the combination of a tubular boom, an extension boom slidable within the tubular boom, means for adjustably holding the extension boom from turning within the tubular boom adapted to be adjusted to turn the extension boom relatively to the tubular boom, a goose-neck on the outer end of the extension boom, a shovel pivotally attached to the goose-neck, and means for operating the shovel.

7. In an excavating machine, the combination of a truck having a platform, a tubular boom pivotally attached to the platform at one end, an extension boom within the tubular boom adapted to be turned within the tubular boom, means for guiding the extension boom and holding the same in the position to which it is turned within the tubular boom, a shovel pivotally attached to the outer end of the extension boom at one side of the longitudinal axis of said boom, and means for swinging the shovel on its pivot.

8. In an excavating machine the combination of a boom, a goose-neck secured to the outer end of the boom formed of parallel bars spaced apart, a shovel adjustably and pivotally attached at its rear end between the ends of said bars forming the goose-neck, a bail pivotally attached to the shovel near its forward end, a sheave journaled between the bars of the goose-neck, a line attached to the bail and engaging the sheave, a rod pivotally attached to the rear end of the shovel and having a head, said rod extending upward between the parallel bars, a yoke through which the rod is adapted to slide, said yoke embracing the goose-neck and adjustably attached thereto, a spring sleeved on the rod between the head and the yoke, and a line attached to the goose-neck for raising the boom.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN HOOD.

Witnesses:
LEWIS E. FLANDERS,
ANNA C. RAVILER.