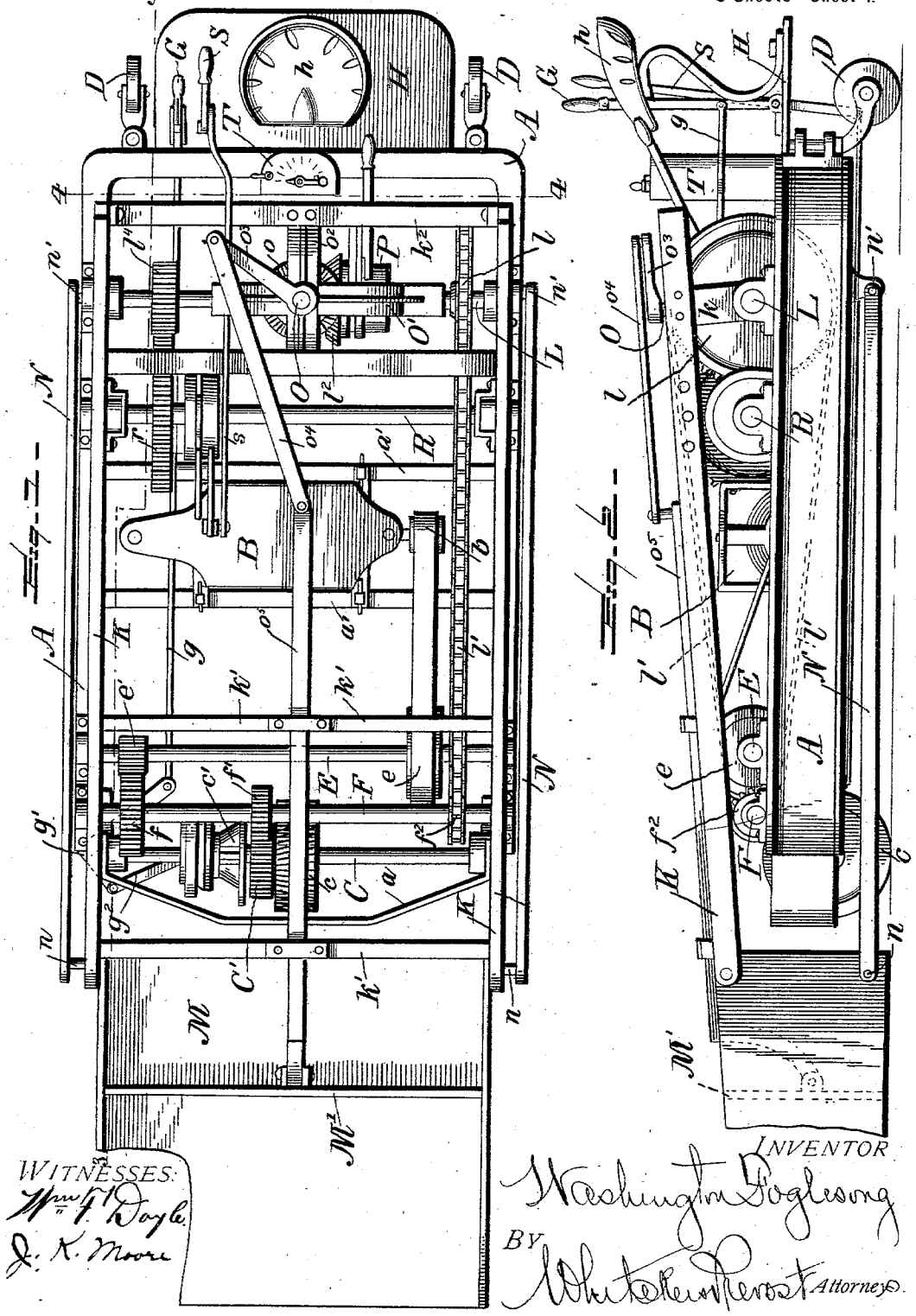
No. 704,740. Patented July 15, 1902.

W. FOGLESONG.

EXCAVATING AND LOADING APPARATUS.

(Application filed Oct. 22, 1901.)

(No Model.) 3 Sheets—Sheet 1.



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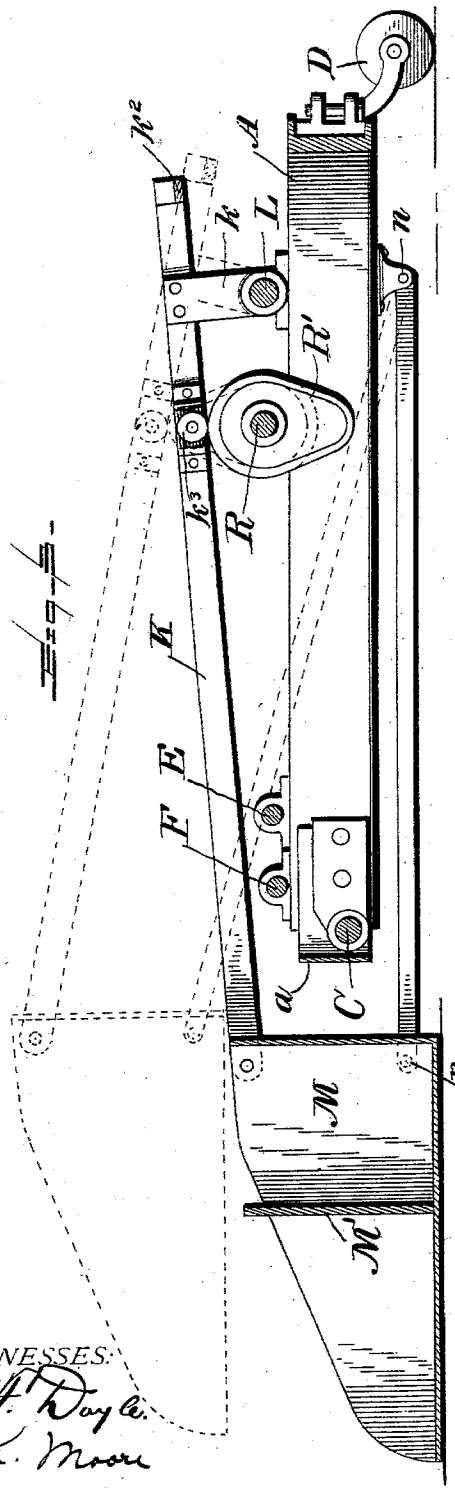

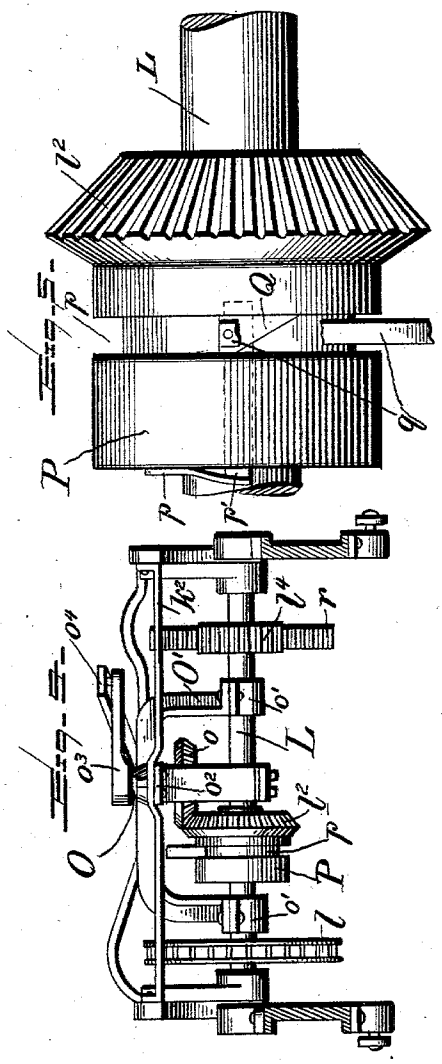

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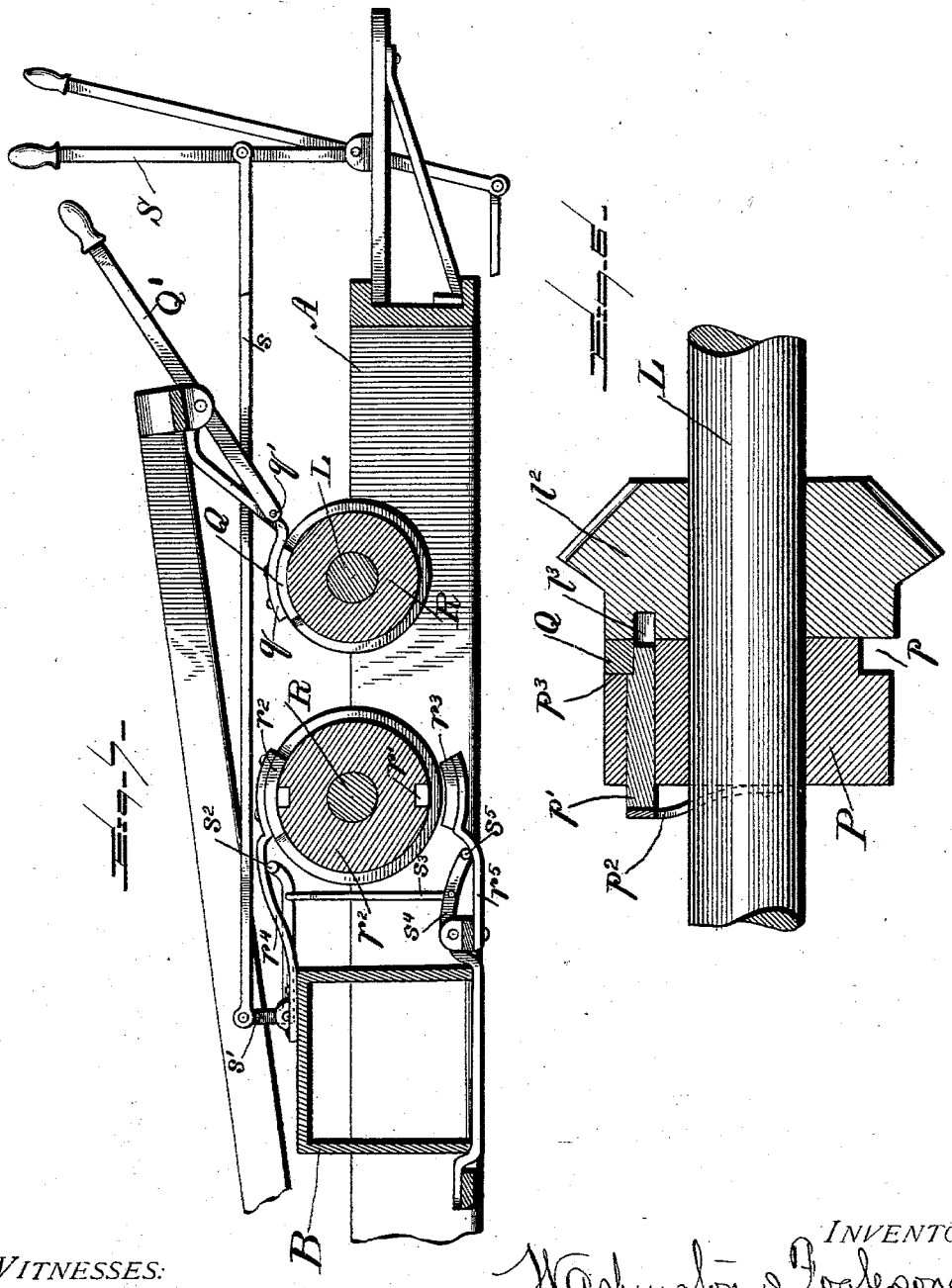

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UNITED STATES PATENT OFFICE.

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EXCAVATING AND LOADING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 704,740, dated July 15, 1902.

Application filed October 22, 1901. Serial No. 79,534. (No model.)

To all whom it may concern:

Be it known that I, WASHINGTON FOGLESONG, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Excavating and Loading Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improvement in apparatus for excavating and loading; and it consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

Referring to the said drawings, Figure 1 is a top plan view of my improved apparatus for excavating and loading. Fig. 2 is a side view of the same. Fig. 3 is a longitudinal sectional view of the apparatus on line 3 3 of Fig. 1. Fig. 4 is a transverse section on line 4 4, Fig. 1. Fig. 5 is an enlarged view of one of the driving-gears of the mechanism for actuating the dumping end board, showing the clutch operating in connection therewith. Fig. 6 is a sectional view of the same. Fig. 7 is a longitudinal sectional view of part of the apparatus, showing the arrangement of levers for operating the clutches with which the machine is provided.

The main frame of the machine consists of a continuous bar A of flanged iron in the form of a letter **U**, the two ends being at the front of the machine and connected by a guard-bar *a*. The side pieces of the frame are braced by suitable cross-bars *a'* to render the construction strong and to assist in supporting an electric motor, which is indicated at B and which is supported by two of the cross-bars *a' a'* adjacent to the middle of the machine and provided with a driving-pulley *b*. At the front end of the main frame is a transverse shaft C, which is provided centrally with a driving and supporting wheel or roller *c*, preferably having its outer surface corrugated or roughened. The rear end of the machine is carried by a pair of caster-wheels D D, mounted in the frame A.

Suitable speed-reducing gearing is employed between the motor and the driving-wheel *c*, which in this instance is constructed as follows: A cross-shaft E is mounted on the main frame forward of the motor and is provided with a band-wheel *e*, which is connected with the band wheel or pulley *b* of the motor. The shaft E is also provided with a pinion *e'*, meshing with a gear-wheel *f* on a shaft F, mounted on the main frame forward of and parallel to shaft E. The shaft F is also provided with a pinion *f'*, meshing with a gear-wheel C', loosely mounted on the shaft C of the driving-wheel *c* and adapted to be connected to said shaft by a clutch *c'* of any preferred style. The clutch *c'* is thrown into and out of gear by a lever G, located on a platform H, carried by the rear end of the main frame and provided with a seat *h* for the operator, said lever being connected by a link *g* with a bell-crank lever *g'*, which is connected by a link g^2 to the clutch. Any other preferred means may, however, be employed to operate said clutch, if desired.

K K represent the scoop lifting and supporting arms, which are provided near their rear ends with downwardly-extending brackets *k*, pivotally mounted on a cross-shaft L, mounted in bearings on the rear part of the main frame. The front ends of the arms K K are pivoted to the upper part of the scoop or shovel M, and said bars are connected by suitable cross-bars, as indicated at *k' k'* and k^2. In order to maintain the scoop in a horizontal position as it is raised or lowered, I provide on each side of the machine a link or rod N, which is pivotally connected at one end to the scoop at *n* adjacent to the bottom thereof and has its other end pivoted to a part of the main frame, as shown at *n'*.

The rear cross-shaft L is provided with a large driving sprocket-wheel *l*, which is driven by a chain *l'* from a smaller sprocket-wheel f^2 on the cross-shaft F. The shaft L is also provided with a bevel-gear l^2, mounted loosely on the shaft and meshing with a horizontal bevel-gear *o*, carried on a vertical shaft O, mounted in a yoke O', the ends of which are

provided with bearings o' o', engaging the shaft L, as shown most clearly in Fig. 4. This yoke is connected by an arm o^2 with the rear cross-bar k^2 of the lifting-arms, so that the yoke, shaft O, and beveled pinion o will remain always in the same position with respect to the lifting-arms. The vertical shaft O is provided at its upper end with a crank o^3, which is connected by a link o^4 to a push-bar o^5, mounted in guides on the cross-bars k' k', and the forward end of the push-bar o^5 is connected to a dumping end board M', arranged in the scoop or shovel M, the arrangement being such that when the shaft O is rotated a complete revolution the end board will be forced from the inner end of the scoop to the outer end, thus discharging the contents, and will then be withdrawn to the rear end of the scoop again.

I provide a clutch mechanism for giving the shaft O one complete revolution, which in this instance is made as follows, reference being had to Figs. 5 and 6: P represents a clutch wheel or pulley secured rigidly to the shaft L at one side of the hub of the bevel-gear l^2 and is provided with an annular groove p adjacent to the pinion. The clutch-wheel P is provided with a sliding bolt p', working in a transverse aperture in said wheel and adapted to enter a notch or recess l^3 in the hub of the bevel-wheel l^2, being forced thereto by a spring p^2, secured to the clutch-wheel and engaging the bolt p'. The bolt p' has the end adjacent to the bevel-wheel l^2 reduced on its upper side to form a shoulder p^3, the said reduced portion being flush with the bottom of the annular groove p. Q represents a wedge which is secured in this instance to a spring-arm q, supported from a part of the framing—in this instance the rear cross-bar k^2 of the lifting-arms. This wedge lies in the groove p at such a point that the notch or recess l^3 in the hub of the bevel-gear l^2 will be opposite the thickest portion of said wedge when the end board is in its rear or retracted position. Q' represents a lever extending within reach of the operator and provided with means for lifting said spring-arm q and wedge Q, in this instance a stud q'. By operating this lever the wedge Q will be lifted out of the groove p, and as the clutch-wheel P revolves, carrying with it the bolt p', when said bolt comes opposite the recess l^3 it will be forced into it by its spring p^2, and the bevel wheel or gear l^2 will then rotate with the shaft L. The operator will then release lever Q', permitting the wedge Q to descend into the groove p. When the bevel-wheel l^2 has nearly completed a single revolution, the wedge Q will engage the shoulder p^3 of the bolt p' and withdraw the bolt from the notch or recess in the gear l^2, thus releasing it just as it completes its revolution, whereby the load in the scoop has been forced out by the end board and the end board has been withdrawn to the rear of the scoop again.

Forward of the shaft L is a cam-shaft R, mounted in bearings secured to the main frame and provided at each side with a cam R' for elevating the arms K K and the scoop. Each of said arms K K is provided, preferably, with a friction-roller k^3, engaging one of the cams R', as clearly shown in Fig. 3. On the shaft R is loosely mounted a gear-wheel r, meshing with a gear-wheel l^4 on the shaft L. I provide a clutch mechanism for connecting the gear-wheel r to shaft R, so as to give the shaft R a half-revolution at a time, and the cams R' R' are so arranged that one half-revolution of the shaft R will elevate the arms K K and the scoop to their highest position, and the other half-revolution will allow the scoop to descend to its lowest position. For this purpose I employ a clutch-wheel R^2, mounted on shaft R and constructed exactly similar to the clutch-wheel P, having a bolt r' adapted to engage a notch or recess in the hub of the gear-wheel r. I, however, provide two wedges r^2 r^3, located at opposite sides of the shaft, so that the bolt r' will be withdrawn when the shaft has made a half-revolution.

In Fig. 7 I have shown the two wedges r^2 r^3 mounted on spring-arms r^4 r^5, respectively, and an arrangement for throwing one of said wedges out at a time to allow the shaft R to make a half-revolution.

S represents a hand-lever pivoted on the rear platform and connected by a link s to one arm of a bell-crank lever s', the other arm being provided with a stud s^2 to engage and lift the spring-arm r^4 and wedge r^2. This bell-crank arm is connected by a link s^3 to a pivoted arm s^4, provided with a stud s^5, adapted to engage the spring-arm r^5 and move the wedge r^3 out of the path of the bolt r'. From the drawings it will be seen that by moving the lever S in one direction one of said wedges r^2 r^3 will be moved out of operation and the other into operative position, and by moving it in the opposite direction the positions of the wedges will be reversed. Thus the shaft R can be readily given a half-revolution to elevate the scoop, and when desired by moving the lever in the opposite direction the shaft R can be given another half-revolution to lower the scoop.

The motor will be supplied with current from a trailing wire or in any other desired way and will be operated by controller T, mounted on the machine conveniently to the operator. The apparatus will be moved up to a pile of dust, gravel, or other matter which it is desired to remove and with the scoop lowered will be driven into it until the scoop is filled. The operator will then throw out the clutch c' and stop the driving shaft and wheel, after which he will operate the lever S so as to impart a half-revolution to the shaft R and raise the scoop to its highest position. The clutch c' will then be thrown in and the machine moved to the place where it is desired to dump the material, when the operator will move the lever Q' to impart a

full revolution to shaft O and thereby dump the contents of the scoop. The machine can then be run back to the desired point, the scoop lowered, and the operation repeated.

This apparatus is particularly advantageous in removing ore, &c., from horizontal shafts, although it can be used for other purposes as well.

What I claim, and desire to secure by Letters Patent, is—

1. In an excavating and loading apparatus, the combination with the main frame, of supporting and driving wheels therefor, a motor carried by said main frame and connected with the driving-wheel, a scoop-supporting frame pivotally mounted on said main frame, a scoop connected to said pivoted frame, a cam-shaft provided with cams for engaging said pivoted frame to raise and lower said scoop and connections between the motor and said cam-shaft, substantially as described.

2. In an excavating and loading apparatus, the combination with the main frame, of a scoop-supporting frame pivoted to the main frame, a scoop carried by said pivoted frame, mechanism for raising and lowering said pivoted frame, and mechanism for automatically maintaining said scoop always in a horizontal position, substantially as described.

3. In an excavating and loading apparatus, the combination with the main frame, of a scoop-supporting frame pivoted thereto, a scoop pivotally connected to said pivoted frame, a connection between said scoop and the main frame for maintaining the scoop continually in a horizontal position and mechanism for raising and lowering said pivoted frame, substantially as described.

4. In an excavating and loading apparatus, the combination with the main frame, of a pivoted scoop-supporting frame carried thereby, a scoop carried by said pivoted frame, a cam-shaft mounted on the main frame and provided with lifting-cams engaging said pivoted frame, and mechanism for imparting a half-revolution to said cam-shaft, substantially as described.

5. In an excavating and loading apparatus, the combination with the main frame, of a pivoted scoop-supporting frame carried thereby, a scoop carried by said pivoted frame, a cam-shaft mounted on the main frame and provided with lifting-cams engaging said pivoted frame, driving mechanism for said cam-shaft including a part loose on said shaft, and a part secured to said shaft, one of said parts being provided with a clutch-bolt, and the other with a recess to receive the same, a wedge secured to a stationary part and adapted to engage said bolt to withdraw the same from engagement with the recess of the other part, and means for moving said wedge into and out of the path of said bolt, substantially as described.

6. In an excavating and loading apparatus, the combination with the main frame, of a scoop-supporting frame pivoted thereto, a scoop carried by said pivoted frame and provided with a sliding end board, a crank carried by said pivoted frame, operative connections between said crank and said end board for dumping the contents of the scoop and mechanism for operating said crank, substantially as described.

7. In an excavating and loading apparatus, the combination with the main frame, of a scoop-supporting frame pivoted thereto, a scoop carried by said pivoted frame and provided with a sliding end board, devices carried by said pivoted frame for operating said end board, and mechanism carried by the main frame operatively connected with said end-board-operating devices, substantially as described.

8. In an excavating and loading apparatus, the combination with the main frame, of a scoop-supporting frame pivoted thereto, a scoop carried by said pivoted frame and provided with a sliding end board, a crank carried by said pivoted frame, operative connections between said crank and said end board, a motor carried by said main frame, connections between said motor and said crank including a clutch for imparting a single complete revolution to said crank, substantially as described.

9. In an excavating and loading apparatus, the combination with the main frame, and a power-shaft mounted thereon, of a scoop-supporting frame pivoted on said shaft, a scoop secured to said pivoted frame and provided with a movable end board, a crank carried by said pivoted frame and connected to said end board, a driving-gear connected to said crank, a driving-gear on said power-shaft engaging said first-mentioned gear, and mechanism for raising and lowering said pivoted frame, substantially as described.

10. In an excavating and loading apparatus, the combination with the main frame provided with supporting and driving wheels, a motor carried by said main frame, connected with the driving-wheel thereof, a pivoted scoop-supporting frame secured to said main frame, a scoop carried thereby, a cam-shaft mounted on said main frame and provided with cams for raising and lowering said pivoted frame and scoop, a crank on said pivoted frame, a movable end board in said scoop, connections between said end board and said crank and connections between said crank and said motor, substantially as described.

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

WASHINGTON FOGLESONG.

Witnesses:
O. C. SIPE,
JOHN D. BOROFF.