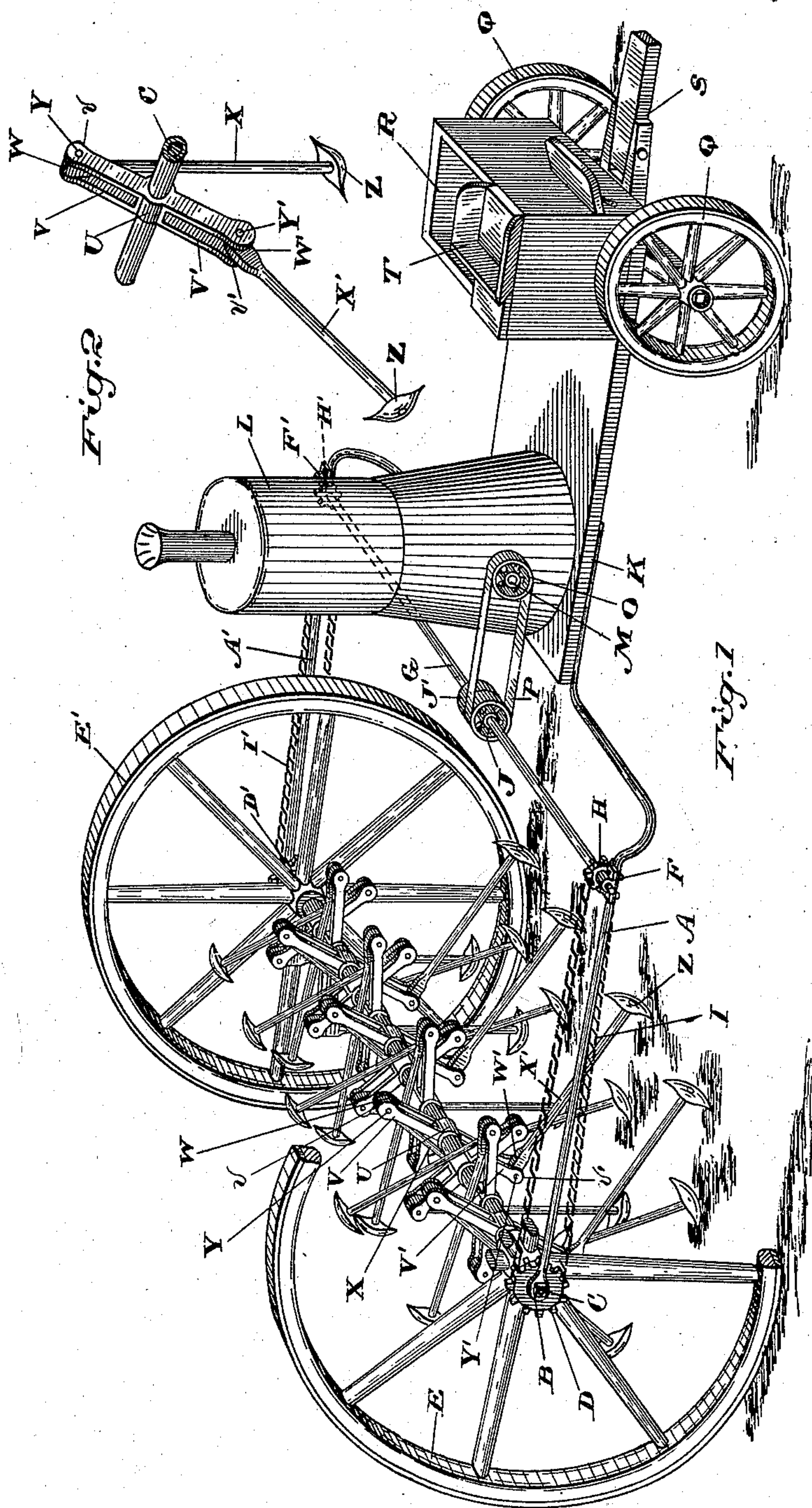


(No Model.)

J. H. STEPHENS.  
EARTH DIGGING MACHINE.

No. 567,622.

Patented Sept. 15, 1896.



Witnesses  
J. H. Stephens  
Donald B. Ridout

Inventor  
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# UNITED STATES PATENT OFFICE.

JOHN H. STEPHENS, OF PETERBOROUGH, CANADA.

## EARTH-DIGGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,622, dated September 15, 1896.

Application filed December 9, 1895. Serial No. 571,492. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HENRY STEPHENS, of Peterborough, in the county of Peterborough and Province of Ontario, Canada, have invented certain new and useful Improvements in Earth-Digging Machines; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to a machine designed especially for road-working purposes, although it may be employed for any other purpose of a similar nature, such as excavating or other work where it is required to loosen or break up earth and stone; and the object of the invention is to so construct the machine that it will raise the tool into a vertical position, and then throw it with considerable force against the surface to be broken and in the case of a pick to drag the head of the pick at an even depth through the earth to the full extent of the arm, in order that the earth can be torn open or loosened, and after the head of the pick has cleared the ground the pick will be raised by the machine into a vertical position for continued action, the whole device being hereinafter more fully set forth, and more particularly pointed out in the claim.

In the drawings, Figure 1 is a perspective view of the machine, showing the various working parts. Fig. 2 is a perspective view of a section of the shaft, showing one set of picks.

Like letters of reference refer to like parts throughout the specification and drawings.

The machine consists, essentially, of two side bars A A', respectively, in which are formed bearings B for the shaft or axle C, adapted to freely revolve in the said bearings. Rigidly mounted on the axle C, on the inner side of and contiguous to the side bar A, is a sprocket-wheel D, and rigidly mounted on the shaft or axle C contiguous to the inner side of the side bar A' is a sprocket-wheel D'. Loosely mounted on the axle C contiguous to the inner side face of the sprocket-wheel D is a carrying-wheel E, and mounted on the axle C contiguous to the inner side face of the sprocket-wheel D' is a carrying-wheel E'. Mounted on the side bars A A' are bearings F F', respectively, in which is journaled a shaft G. Mounted on the shaft G contiguous to the bearing F is a sprocket-wheel H, and mounted on the same shaft G contiguous to the bearing

F' is a sprocket-wheel H'. Passing around the sprocket-wheels D E is a sprocket or drive chain I, and passing around the sprocket-wheels D' E' is a sprocket or drive chain I'. Mounted on the shaft G is a fixed pulley J and a loose pulley J'. Mounted on the platform K is an engine L or other power-producing device, and mounted on the shaft M of the engine L is a pulley O. Passing around the pulleys O J is a belt P, by means of which motion is transmitted from the engine to the shaft G. The front ends of the side bars A A' are preferably secured to the under side of the platform K. Supporting the front end of the platform K above the carrying-wheels Q is a fuel-box R. Connected to the platform K is a shaft or tongue S and mounted on the top of the fuel-box R is a seat T.

Rigidly mounted on the shaft or axle C, at equidistant points between the wheels E E', are a series of hubs U. Projecting from one side of each of the hubs U is a bifurcated arm V, and projecting from the opposite side of the hub U is a similar arm V'. Within the bifurcated end v of the arm V is the hub W of the arm X. Passing through the arm V and through the hub W is a removable pivot-pin Y, which pivotally connects the arm X to the arm V. Pivotaly connected to the bifurcated end v' of the arm V' is the hub W' of the arm X'. The pivot-pins Y Y' are both removable, in order that they can be withdrawn and the picks removed from the arms V V' when it is not required to employ them or when it is necessary to remove and replace them with others. The outer end of each of the arms X X' is fitted with a removable head Z. As shown in the drawings and described throughout the specification, this head Z consists of a pick-head for the purpose of entering and tearing open the earth. It can, however, be changed for any other style of a tool, such as a hammer-head for breaking stone, or any other tool of a similar nature can be substituted for it. The hubs U are set on the shaft or axle C, so as to arrange the bifurcated arms V V' at different angles to the vertical axis of the shaft, in order that the picks can strike the ground continuously from end to end of the axle at different times.

The operation of the device is as follows: Motion is transmitted to the shaft G by means



of the pulley O, belt P, and fixed pulley J on the said shaft. When it is desired to stop the motion of the shaft G, the belt P is transferred to the loose pulley J'. The sprocket-wheels H H' revolve with the shaft G and transmit motion to the sprocket-wheels E E' by means of the sprocket-chains I I'. The revolution of the sprocket-wheels E E' causes the revolution of the shaft or axle C, and the revolution of the shaft or axle C raises the picks into a vertical position and causes them to descend to the surface with sufficient force to break it and then drag the picks through the surface to the full extent of the arms X X', when the continued revolution of the shaft or axle raises the picks again into a vertical position for continued action. For operating on a vertical wall or a margin the machine is backed against the wall and set in motion, the motion being the same as that hereinbefore described.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

25 An earth-digging machine, consisting of a shaft, a series of hubs arranged on the shaft equidistant from each other, a bifurcated

arm extending from each side of each of the hubs, an arm pivotally connected to each of the bifurcated arms, a tool-head fitted to the outer end of each of the arms, frame-bars, bearings in the frame-bars, in which are journaled the ends of the shaft or axle, two sprocket-wheels mounted one contiguous to the inner side of each of the bearings, carrying-wheels mounted on the axle and located one contiguous to each of the sprocket-wheels, a shaft journaled in bearings mounted on the frame, sprocket-wheels mounted on the shaft, sprocket-chains passing around the sprocket-wheels on the shaft and on the axle, fixed and loose pulleys mounted on the shaft, a supplemental carriage, a power-producer mounted on the supplemental carriage, a pulley mounted on the shaft of the power-producer, and a belt passing around the shaft of the power-producer, and around the fixed pulley, substantially as specified.

Toronto, November 25, A. D. 1895.

J. H. STEPHENS.

In presence of—

C. H. RICHES,

M. A. WESTWOOD.