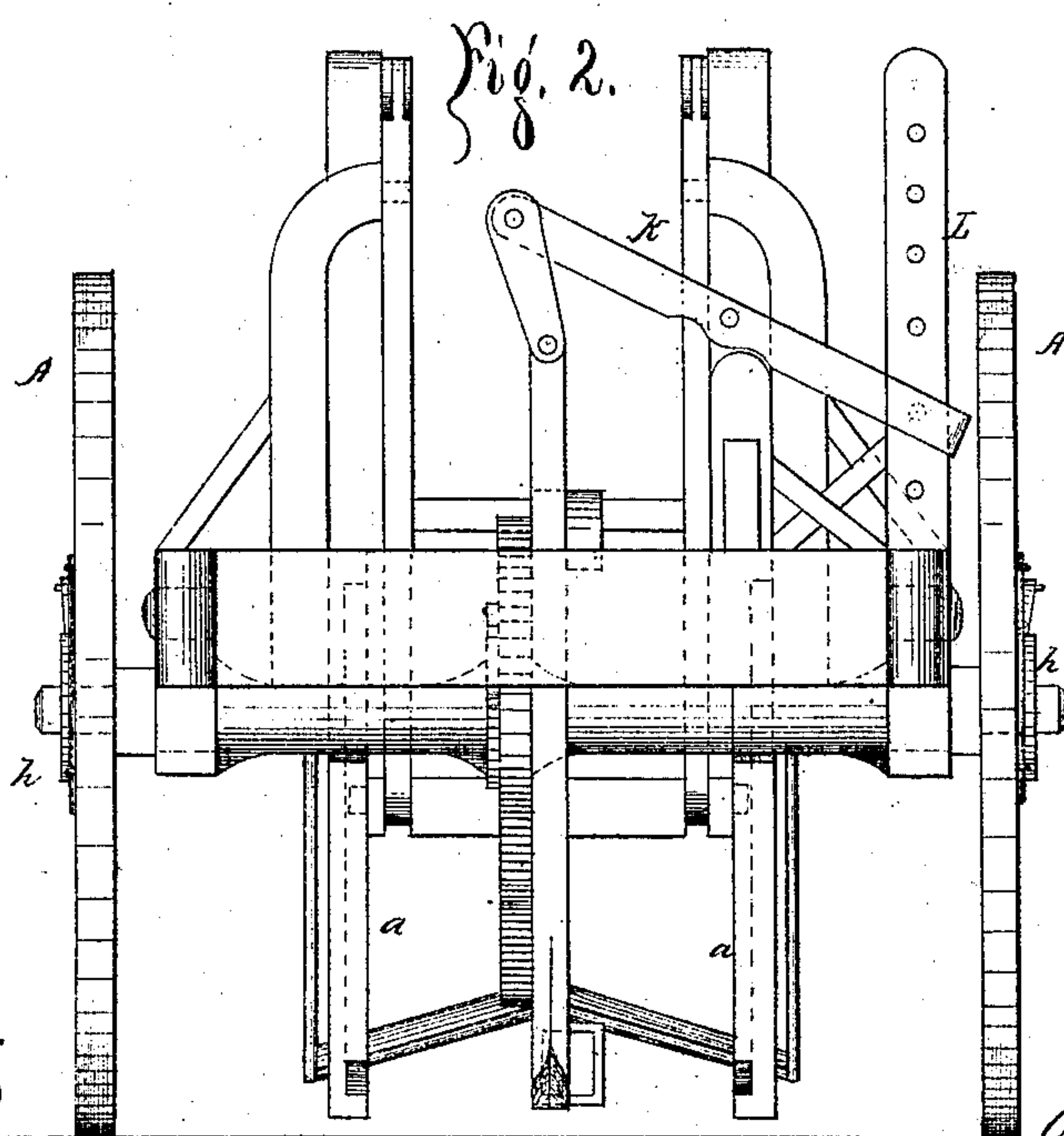
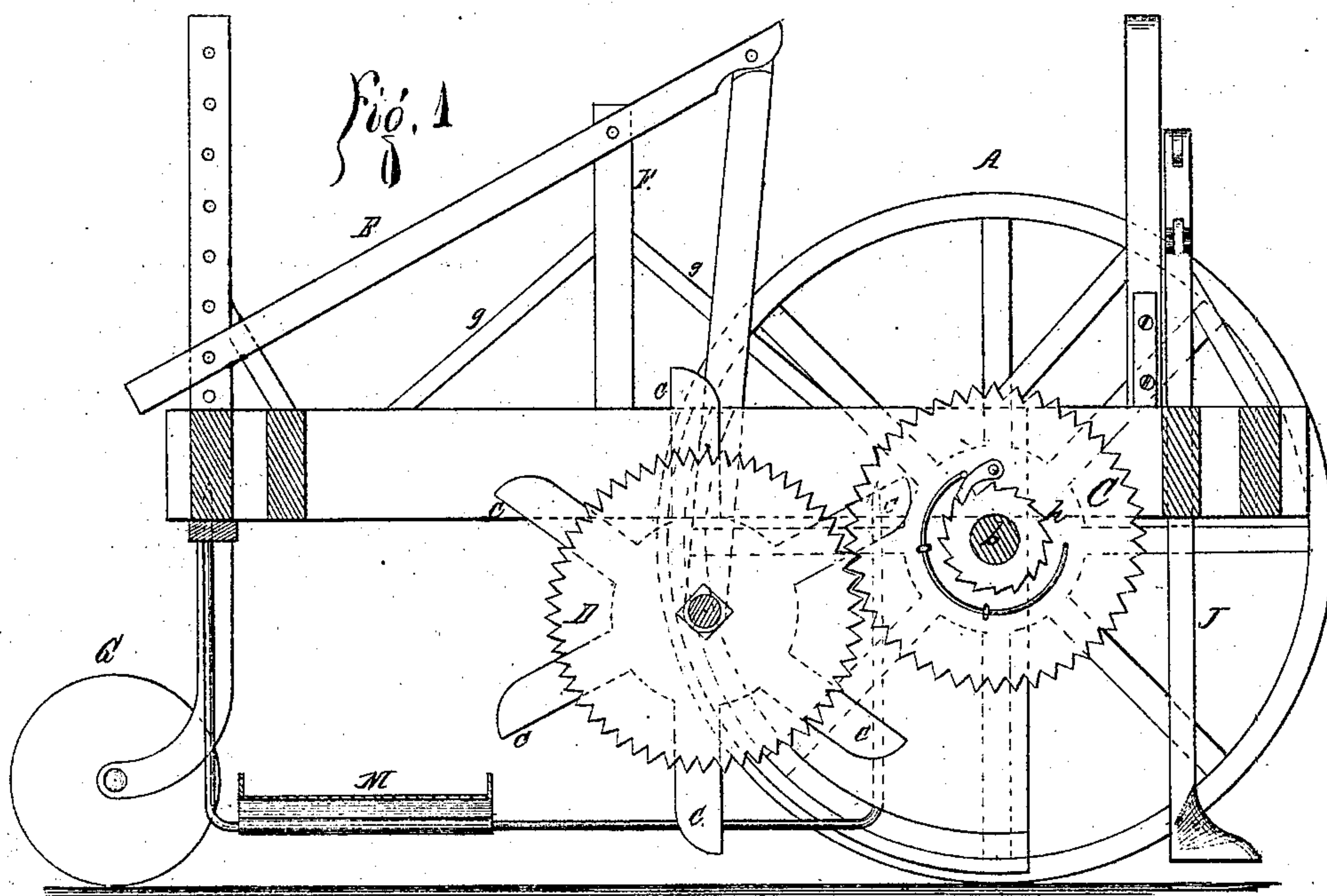


M.C. & G.B. Higgins,

Excavator.

No. 104,153.

Patented June 14, 1870.



Witnesses.

*Francis Snowden
Addie D. Hills*

Inventor.

*Mahlan C. Higgins
Gilbert B. Higgins
by Henry C. Taylor*

United States Patent Office.

MAHLON C. HIGGINS AND GILBERT B. HIGGINS, OF FLEMINGTON, NEW JERSEY.

Letters Patent No. 104,153, dated June 14, 1870.

IMPROVEMENT IN DITCHING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

We, MAHLON C. HIGGINS and GILBERT B. HIGGINS, of Flemington, in the county of Hunterdon and State of New Jersey, have invented a new and useful Improvement in Ditching-Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and the letters of reference marked thereon.

Figure 1 is a longitudinal section of a ditching or trenching-machine, showing our improvement.

Figure 2 is an end view.

The object of our device is to facilitate the operation of ditching and trenching by means of horse or other power.

A particular description of our invention appears as follows:

A, in fig. 1, represents the driving or carriage-wheels, secured to axle *b*, at or near the center of which is a cog-wheel, C, provided either with ratchet or lever, and closely fitting into another cog-wheel, D, so that, when the axle *b* revolves while the machine is being propelled forward, the cog-wheel C turns the wheel D in the opposite direction, causing the shovel-buckets *c c c c c c* to revolve.

These shovel-buckets are secured permanently upon the same shaft or axle as cog-wheel D, which axle and cog-wheel are lowered or raised at pleasure by means of double lever E, which is supported by fulcrums F, and these fulcrums are securely held in a permanent position by means of braces *g g*.

This double lever is used for the purpose of lowering or raising the shaft on which cog-wheel D and the shovel-buckets are attached, and are depressed or elevated, as required, in order to graduate the depth of the trench or ditch. This shaft fits closely and slides through grooves made in a circular form in guides at each end, represented by dotted lines *a a* in fig. 2.

G shows a rear supporting-wheel on each side, provided with a swivel, in order that the machine can be turned at any angle without moving cog-wheel D, and, when it is required to move the machine backward, it can be done without difficulty.

The driving or main wheels A are on the outer end of the axle, and are provided with a ratchet, as shown by *h*, so that, when the machine is moved backward, the cog-wheels will not turn, and the shovel-buckets therefore remain stationary.

The machine can be turned at any angle backward without moving the cog-wheels; but, when propelled forward, either in turning wholly or partly around, the shovel-buckets move proportionately.

Under the forward part of the machine, and in front of the shovel-buckets, we place a plow, J, composed of steel, and may or may not be braced and used in the same manner as an ordinary plow-colter, for the purpose of loosening the earth in the trench or ditch, in order that there may be less strain upon the shovel-buckets.

This plow is raised or lowered by means of the hinged lever K, operated by the driver, and held in its position by a small peg in standard L.

Near the lower end of plow J there is a chain, which is attached to the forward part of the machine, in order to give the plow additional strength and to further secure it in the position required.

M is an apron or platform on the rear end, sloped on each side, so as to throw off the earth deposited upon it by the shovel-buckets. This platform can be raised or lowered according to the desired depth of the trench. It can also be constructed so as to throw all the dirt on one side, or partly on the one side and partly on the other.

This machine can be made entirely of iron except the plow, or of wood and iron combined.

Our device is less expensive in manufacture than any other now in use, in no way liable to get out of order, and easily operated by two persons.

Having thus fully described our invention,

What we desire to secure by Letters Patent is—

A ditching-machine, composed of the three ratchet-wheels *h h h*, fixed upon the shaft *b*, the internal gearing D and C, by which the movement of the main wheels A is imparted to the arms containing the shovel-buckets *c*, the double lever E, regulating the height of the wheel D and buckets *c*, operating in guides *a a*; also, the lever K, graduating the depth of plow J, and rendered stationary by small pins in standard L, the guide or supporting-wheels G, and platform M, when arranged as herein described.

MAHLON C. HIGGINS.
GILBERT B. HIGGINS.

Witnesses:

GEORGE HANSON,
JOS. C. SMITH.