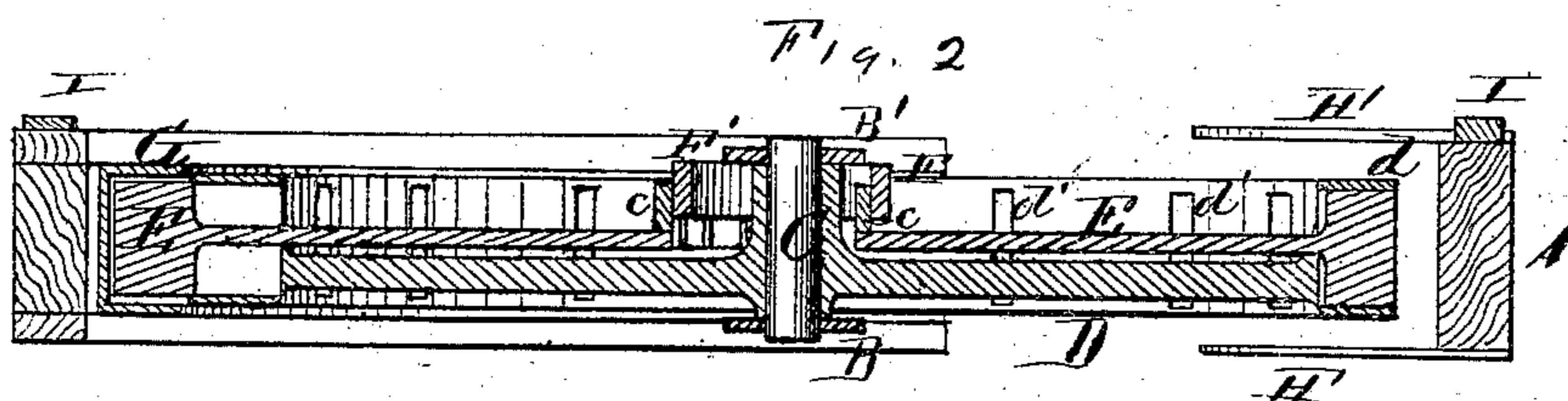
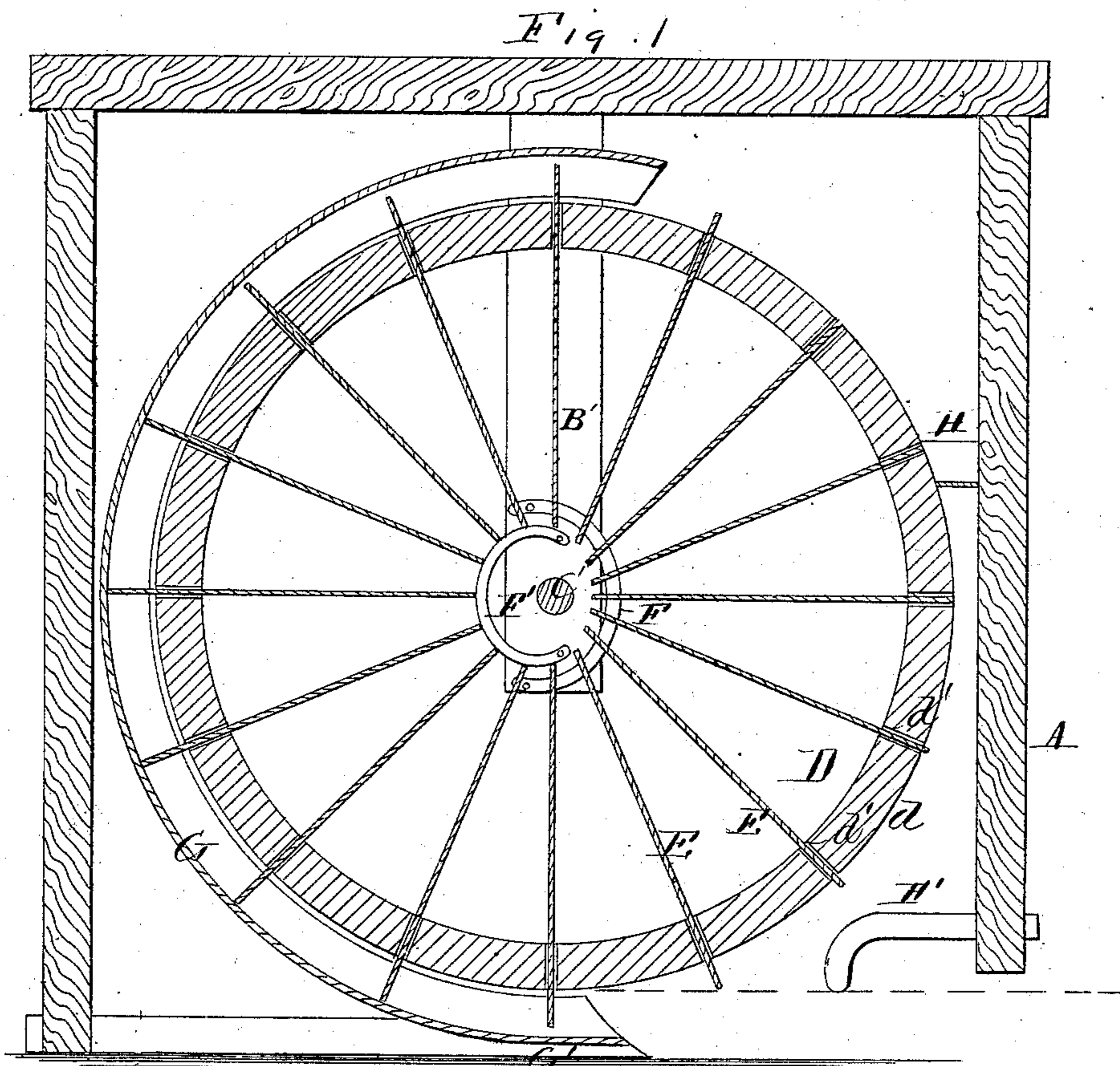


R. STARBRICK.
Ditching-Machines.

No. 135,605.

Patented Feb. 4, 1873.



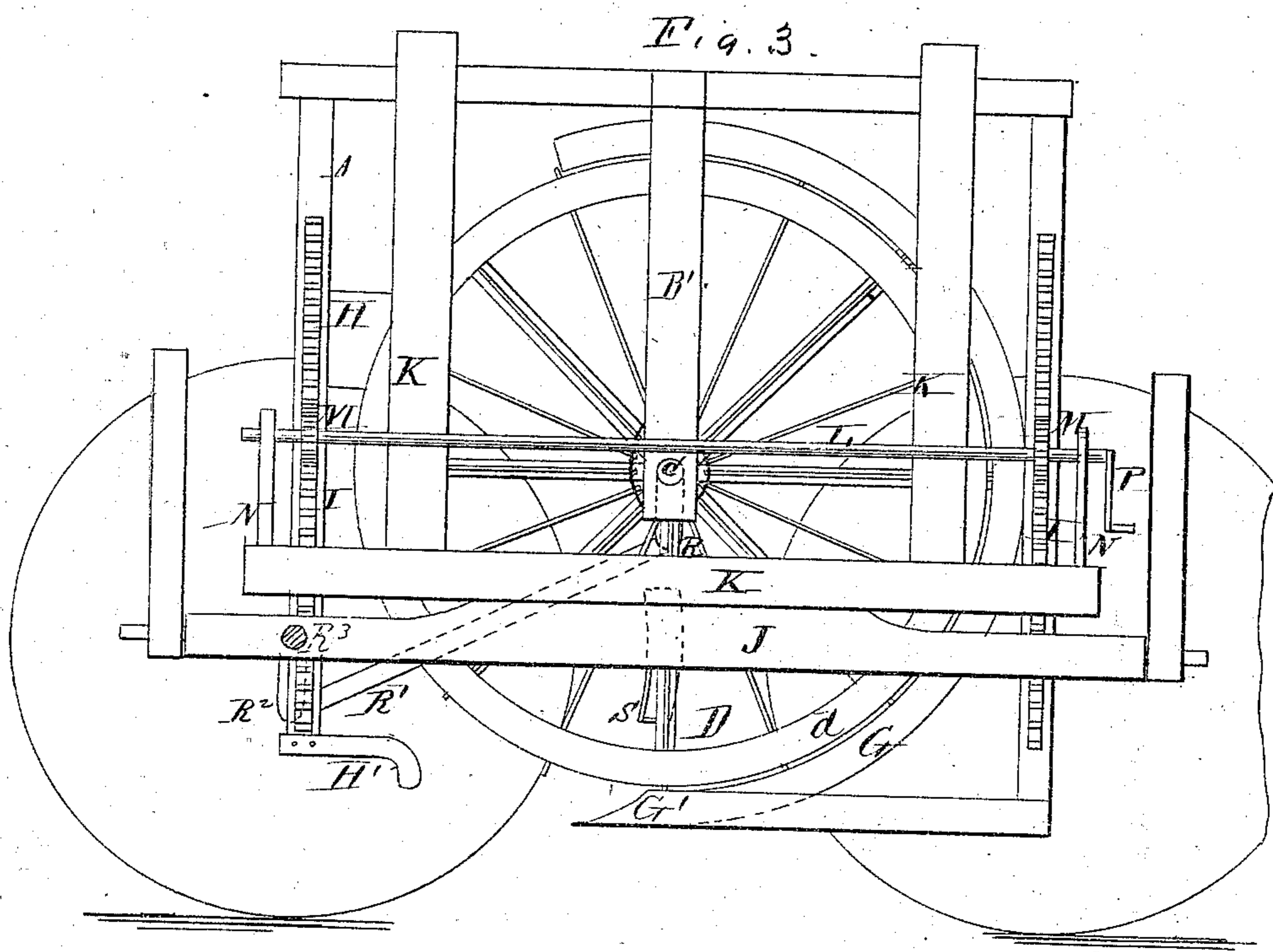
Witnesses
E. A. Bates
C. B. Hale

Inventor
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UNITED STATES PATENT OFFICE.

REUBEN STARBRICK, OF WILMINGTON, OHIO.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. 135,605, dated February 4, 1873.

To all whom it may concern:

Be it known that I, REUBEN STARBRICK, of Wilmington, in the county of Clinton and State of Ohio, have invented an Improved Ditching-Machine, of which the following is a specification:

In the accompanying drawing, Figure 1 is a vertical longitudinal section of my invention. Fig. 2 is a horizontal section; and Fig. 3 is a side elevation of my improved ditcher supported on a wagon, the latter being shown in vertical longitudinal section.

This invention has relation to ditching-machines; and consists in the combination and arrangement of a ditching-wheel with slotted rim, semi-elliptic cams of different sizes secured to the frame of the machine, reciprocating spades having followers to engage with said cams, a scoop-plow, semicircular dirt-spout, frame having toothed racks, earth-cutters, and wheel-scraper, and wagon provided with pinion-shaft holding pinions to engage with the toothed racks for the purpose of raising and lowering the main frame, all substantially as hereinafter more fully set forth.

Referring to the drawing, A designates a rectangular upright frame; B B', standards depending from the top, one on each side, and supporting the shaft C of the ditching-wheel. D designates the ditching-wheel, having a wide rim, *d*, slotted at regular intervals, as shown at *d'*, the slots running toward the center of the wheel. This rim projects further over one face of the wheel than over the other, in order to allow space for the spades and their operating devices. E designates the spades, the blades or heads of which pass through the slots *d'*, while the handles extend toward the shaft C. Upon the end of each spade-handle is a follower, *c*, which projects toward the standard B', to which are bolted the stationary cams F F'. The cams F F' are in the nature of two C-shaped or semi-elliptical flanges, arranged with their concave surfaces toward each other, and their convex surfaces toward the rim of the ditching-wheel. The major axes of these cams are vertical. The cam F is larger than the cam F', but the cam F' lies further in a horizontal direction from the center of the wheel than the cam F does, and is nearer in form to a semicircle

than the latter. Now, when the wheel turns forward, the followers *c* pass over and around the outer surface of the cam F', and then under and against the inner surface of the cam F. By this means the spades are forced out gradually as they approach the rear end of the machine, and are drawn back gradually as they approach the forward end, the cam F' forcing them out, and the cam F drawing them back. G designates a dirt box or spout, arranged at the back part of the ditcher, and secured to the frame. This spout is concentric with the ditching-wheel, the spades of which project into said spout, and, when the wheel is on duty, convey the earth into and up through it to its upper end, which end lies forward of the center of the wheel, and thus the spout is enabled to empty its contents into a scraper, H, by which the clay is carried off to one side of the ditch, and the rim of the wheel kept clean. The spades begin to project from the forward side of the wheel at a point a short distance above the surface upon which the wheel is rolling, and enter the clay gradually, loosening it and then conveying it into and up through the spout. The spout at its lower end has a scoop-plow, G', which slices the clay off underneath the spades, so that they may easily gather their loads. The spades begin to recede at a point slightly back of the center of the wheel, and are drawn back gradually as they approach the scraper until their ends are flush with the surface of the wheel. In this way one spade at a time casts its load into the scraper. H' represents cutters, secured to the lower part of the front beam of the frame A. These cutters are designed to mark out and pare off the sides of the ditch so that the wheel may pass through more easily. I designates toothed racks secured to the sides of the front and back beams of the frame A. J represents a wagon or truck, having a frame, K, to hold the ditching-machine while the same is being transported. L designates a shaft running across said truck, and holding pinions M, which engage with the racks I, and serve as means for raising and lowering the ditching-machine. The shaft L is supported by standards N, and is operated by means of a crank, P. In order to rotate the ditching-wheel, its shaft is formed with

cranks R outside the standards B B'. These cranks are connected by pitmen R¹ to cranks R² formed on the shaft or axle R³ of the front pair of carrying-wheels, said shaft or axle being arranged to turn with its wheels. When the wheel D is lowered for work, the ends of its shaft, beyond the cranks R, descend according to the progress of the work through guides S secured to the wagon-frame, said guides being curved to keep the shaft C at the same distance from the centers of the cranks R² at any position to which the wheel is lowered. When the ditching-wheel is raised from the ground the pitmen may be uncoupled from the cranks R.

Other available means for rotating the ditching-wheel may be employed, when desired.

Having fully described my invention, what

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

The improved ditching-machine, having the rotary ditching-wheel D with slotted rim devoid of flanges, the semi-elliptic cams F F' of different sizes rigidly secured to the standard B', the reciprocating spades E having the followers c, the scoop-plow G', and semicircular dirt box or spout G, in combination with the frame A having the toothed racks I, cutters H', and scraper H, and the wagon J supporting the pinion shaft L, all substantially as and for the purpose specified.

REUBEN STARBRICK.

Witnesses:

A. HOOKETT,
L. J. WALKER.