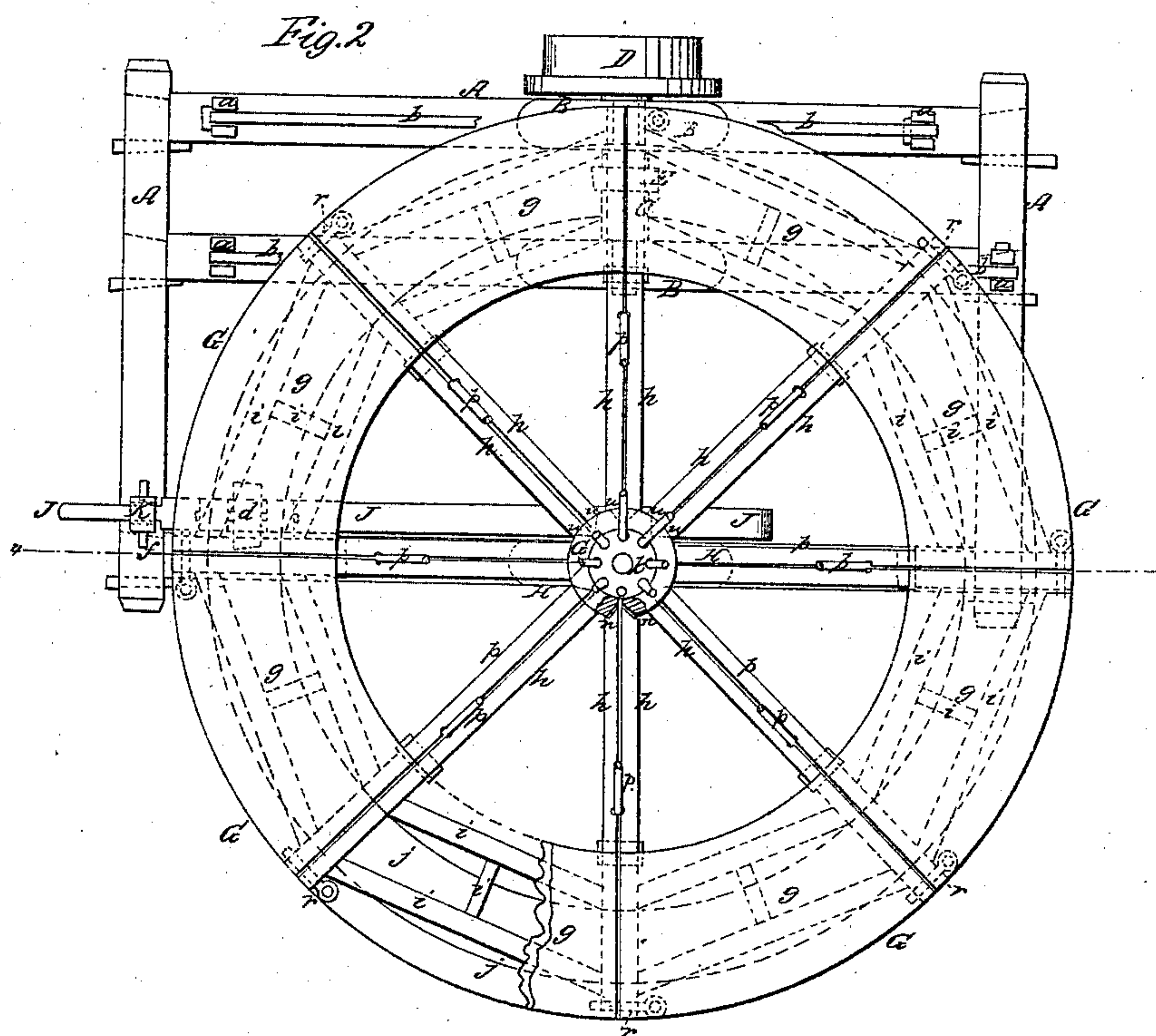
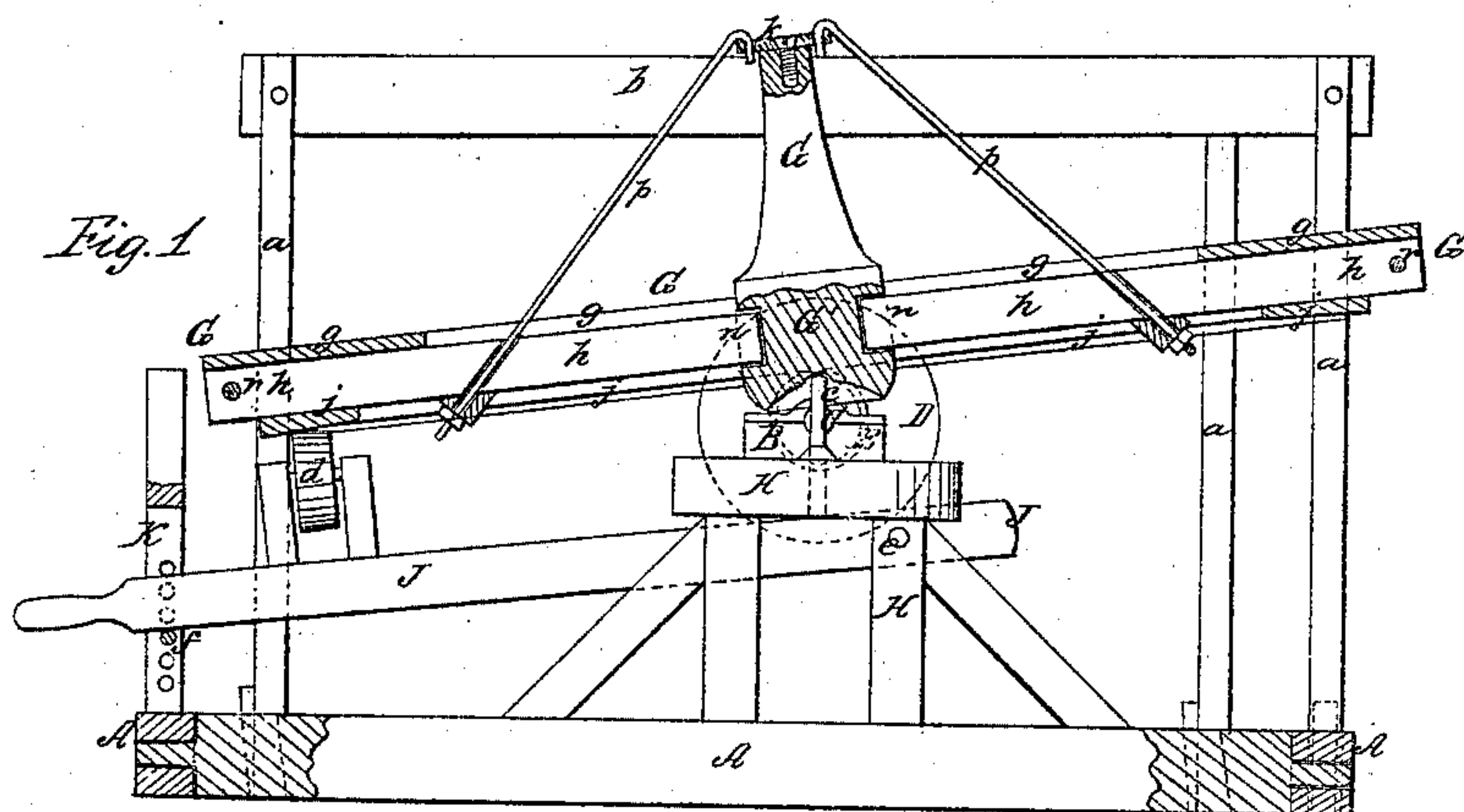


*Middaugh & Clark,*

*Horse Power.*

*N<sup>o</sup> 33,358.*

*Patented Sep. 24, 1861.*



*Witnesses:*  
*J. S. Spencer*

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*attorneys.*



# UNITED STATES PATENT OFFICE.

H. B. MIDDAUGH AND ALBERT CLARK, OF MANSFIELD, PENNSYLVANIA.

## IMPROVEMENT IN HORSE-POWER MACHINES.

Specification forming part of Letters Patent No. 33,358, dated September 24, 1861.

*To all whom it may concern:*

Be it known that we, H. B. MIDDAUGH and ALBERT CLARK, of Mansfield, in the county of Tioga and State of Pennsylvania, have invented a new and Improved Horse-Power Machine; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal section through the improved horse-power machine in the vertical plane indicated by the red line *x x* in Fig. 2. Fig. 2 is a plan view of the improved machine.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to certain novel improvements in that class of horse-powers wherein a large rotating tread-wheel is employed, on which the horse steps for transmitting power from the animal to the machinery to be driven.

To enable those skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A is the horizontal part of the frame of the machine, and *a a a a* are four perpendicular posts carrying two horizontal bars *b b* on their upper ends, which form a kind of frame or stall for keeping the horse in one place when at work on the machine. The horse is therefore hitched between the horizontal bars *b b*, so that he can neither move forward nor backward.

B B is a frame-work, which is built upon frame-work A for supporting the horizontal shaft C, carrying the large belt-wheel D on one end and the beveled cog-wheel E on or near its other end. The frame B B is made sufficiently strong to support the weight of one side of the tread-wheel G and the horse which steps on this wheel G over this frame B B.

The pinion spur-wheel E engages with teeth which are formed around the bottom surface of the wheel G, and as the wheel G is rotated it communicates a rotary motion to the shaft C through the medium of the gearing first described.

The drawings do not represent the teeth of the wheels E and G, as above described, as the teeth may be dispensed with in some in-

stances and the shaft C driven by the friction of contact of the two wheels E and G, and in this case the surfaces of these wheels will be smooth, as represented in the drawings.

H is a strong frame, which is erected on frame A opposite to the frame B B, and on top of frame H a vertical step-pin *c* is securely fixed, on which the hub of the tread-wheel G is stepped, as shown in Fig. 1 of the drawings. The upper end of pin *c* projects up to a horizontal plane touching the highest point of the periphery of wheel E. The wheel G is stepped at its center on the stationary pin *c*, about which the wheel turns, and near the circumference of this wheel G it is supported on the wheel E. Thus wheel G has two bearings which are in the same horizontal plane. This wheel G is supported on a third bearing, which is an adjustable roller *d*, having its bearings on a lever J. Lever J is pivoted at *e* to frame H and extends out in a longitudinal direction and passes through a slot in the vertical stationary post K. Post K has a number of holes made transversely through it for receiving a pin *f*, which supports this end of the lever J at any point of elevation which it may be desired to set it. By raising or depressing the free end of lever J the wheel G may be given any desired inclination from a horizontal plane. At the same time the bottom of wheel G will have a good bearing on the surface of wheel E.

The entire frame-work for supporting the wheel G may be jointed together in such a manner that it can be easily taken apart and put together again when desired. For this purpose half dovetail tongue-and-grooved joints may be used with wedges for locking the parts together, as represented in Figs. 1 and 2 of the drawings.

The tread-wheel G may be made of any desirable diameter, and this wheel is constructed so that it can be readily taken apart in sections and packed up very compactly, as will now be described. The circular treadway *g* is divided into eight or more or less segments, as shown in Fig. 2 of the drawings, and to the bottom of each end of each section *g* a radial arm *h* is securely bolted, to which arms *h h* the bracing-timbers *i i i* are secured. The segments of the circular friction-bearing surface or cogged wheel, as the case may be, are securely bolted to the bottom of each portion



*g*. The ends of all the segments *g* and *j* are nicely beveled, so that they will fit snugly together and form the wheel *G*. The converging ends of the arms *h* are beveled inward and a shoulder *n* is formed on the outside of each arm, which shoulder abuts against the hub *G'* of the wheel *G* when the tapering ends of the arms *h* are inserted into the mortises in this hub. The hub *G'* is formed with a central concavity in its lower end to receive the step-pin *c*, and the hub is made quite long, so that its upper end will project up some distance from the surface of the wheel *G*. On the upper end of the hubs *G'* a cap *k* is fixed, having a number of perforations through its edge, as many as there are radial arms in the wheel *G*, and to this cap the upper ends of the bracing-rods *p p p* are secured, their lower ends being bolted to the arms of wheel *G* when the segments composing this wheel are all put together.

In putting together the segments composing the wheel *G* the beveled ends of arms *h h* are inserted into the mortises made around the hub *G'* to receive them. When the segments have all been thus put around the hub *G'*, the radial arms *h h* of one segment *g j* will be clamped to those of the adjacent segment *g j*, and so on around the wheel. Thus the radial arms *h h* will be clamped together in pairs and held securely in and around the hub by the brace-rods *p p*, above described. The pins *r r*, which are passed through the extreme outer ends of each pair of arms *h h*, assist in securing the segments together, so as to give solidity and stiffness to the wheels.

Now it will be seen from the foregoing description that the tread-wheel *G* can be ad-

justed and placed either in a horizontal position or in a very inclined position by means of the lever *J*, on which the circumference of the wheel *G* rests, and that this adjustment can be effected and the wheel *G* placed in an inclined or in a horizontal position without changing the position of the center or step pin *c*. Thus the wheel *G* may be geared to the pinion *E* and made to operate upon this pinion *E* equally as well in an inclined position as in a horizontal position, as the center of the wheel is not changed in adjusting the wheel.

The tread-wheel *G* may be taken apart by loosening the brace-rods *p p p* and removing the pins *r r r*, and the entire machine may be packed up in a very small compass.

We are aware that the tread-wheel of a horse-power has been so arranged that the plane of its rotation can be variably inclined by stepping the shaft or hub of the wheel in a vertically-adjustable bar, so that the wheel may be adjusted bodily. Therefore, we do not claim such as our invention.

What we do claim as new, and desire to secure by Letters Patent, is—

The arrangement of the elevated hub *G'*, braces *p*, and separable segment toothed wheel *G* with each other and with the centering pin or pivot *c*, adjustable lever *J*, and supporting-wheel *d*, all the parts being constructed and operating together in the manner herein shown and described.

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