R. W. BENEDICT

HORSE-POWERS.

No. 180,828. Patented Aug. 8, 1876.

Fig. 1.

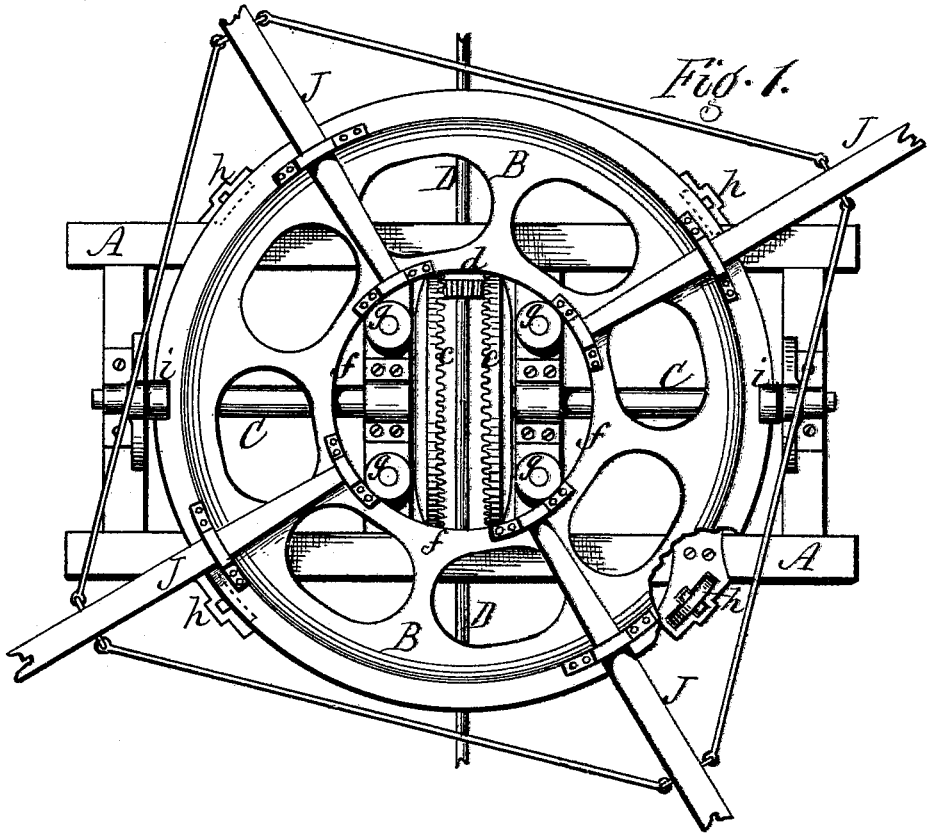
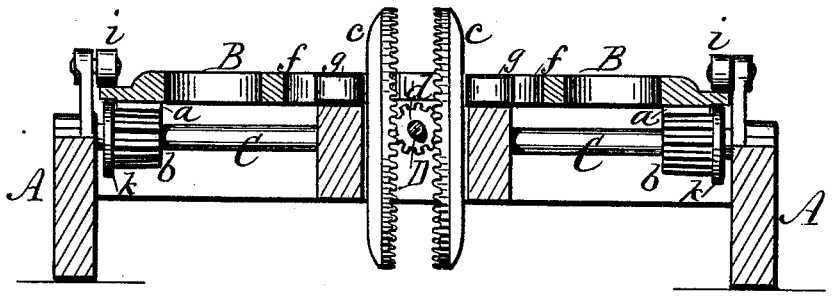


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

RICHARD W. BENEDICT, OF PERRY, NEW YORK.

IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. **180,828**, dated August 8, 1876; application filed December 10, 1875.

To all whom it may concern:

Be it known that I, RICHARD W. BENEDICT, of Perry, in the county of Wyoming and State of New York, have invented a certain new and useful Improvement in Horse-Powers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan. Fig. 2 is a central vertical section.

My improvement relates to horse-powers in which a horizontal toothed driving-wheel is used to give motion to the tumbling-rod by means of center-gears attached to short shafts gearing at the outer end with the driving-wheel. The invention consists, essentially, in constructing the driving-wheel with a central eye or opening to receive the center-gears, and combining with the same a system of friction-rollers, as hereinafter described.

A represents the frame, which may be either stationary or mounted. B is the driving-wheel, having a cog or tooth rim, *a*, on its under side and near its periphery. C C are short shafts located under the driving-wheel, having pinions *b b* at the outer ends, which engage on opposite sides with the cog-rim *a*, and having bevel-gears *c c* at the inner end, between which is located the pinion *d* of the tumbling-rod D. The gears *c c*, engaging with the tumbling-rod pinion *d* on opposite sides, balance the same, thereby making the power more effective, and producing the minimum amount of friction. The driving-wheel is operated by the usual sweeps or levers J J. Thus far the machine is of ordinary construction. The center-gears *c c* are necessarily of considerable size, in order to give sufficient motion to the tumbling-rod. Heretofore, in order to give space for said gears, the driving-wheel B has been made arching or concave on its under side, thereby forming a chamber for the center-gears, and a short spindle or shaft attached centrally on its under side has been made to rest in a step or bearing of the frame elevated above the gears *c c*. The driving-wheel in that case is made entire or with no opening in the center. This has been necessary, because no means have been known by which a flat wheel could be used. Undue weight of the driving-wheel is thus produced, and the hanging of the same in an elevated step is both expensive and difficult to attach and is deficient in strength; and furthermore a wheel so hung, with its bearing elevated above the line of draft, produces great friction and strain, and is unequal in action.

To obviate these difficulties, I construct the driving-wheel B flat, or nearly so, and form in the center an eye or opening, *f*, of sufficient size to allow the gears *c c* to pass through, as shown in Fig. 1. In this opening are friction-rollers *g g g g* resting on cross-pieces of the frame A, and bearing against the inner periphery of the driving-wheel, to keep the same properly centered. On the quarters are four friction-rollers, *h h h h*, which rest under the rim of the wheel for supporting the same, and on top and in line with the shafts C C are two upper rollers, *i i*, resting on the flange, which keeps the wheel down to its work. The inner periphery of the wheel thus forms the rolling-surface resting against the friction-rollers *g*, and no other bearing is required for keeping the wheel centered. The friction is also greatly reduced over a spindle and step. These rollers take the great strain in action—the top and bottom rollers only preventing vertical movement in either direction.

By this means the center-gears have ample room and full play, while the driving-wheel is firmly seated, and, being flat, it is light and occupies less space, there is less cost in construction, and, its center bearings being in line with the draft-levers, there are less strain and binding than in other machines of the class.

I am aware that driving-wheels have before been used, consisting of simple rings, toothed to give motion to the gearing, but used in different kinds of powers from that above described. I design to have only sufficient space at the eye to allow passage of the center-gears, and by this means I bring the friction-rollers *g g* as near as possible to the center of the driving-wheel, which is desirable to reduce friction and lessen the strain.

I construct the outer pinions *b b* on the shaft C C with flanges or rims *k k*, which rest under the flange of the wheel, and thus form rollers additional to the rollers *h h* resting un-

der the wheel. These flanges are not so much to form friction-rollers as to prevent undue friction and binding between the teeth of the cog-rim *a* and pinions *b*. At these points, where the wheel passes under the upper rollers *i i*, the unequal action is likely to force the cog-rim down forcibly upon the pinions at intervals, especially if the power is greater on one side than on the other, or if the drawing-strain is upward. These flanges obviate all difficulty of the kind.

Having thus described my invention, I do not claim, broadly, a cog-rim resting on guides, and giving motion to the gearing in a horse-power.

I claim—

In a horse-power, the combination, with the master-wheel B, provided with the eye *f*, of the center-rollers *g g g g* bearing against the inner periphery, the quarter-rollers *h h h h* bearing under the rim, and the intermediate rollers *i k* embracing the rim in line with the pinions *b b*, as and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

R. W. BENEDICT.

Witnesses:

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