2 Sheets--Sheet 1.

T. HARRISON & W. C. BUCHANAN.

Improvement in Horse-Powers.

No. 129,552. Patented July 16, 1872.

Fig. 1.

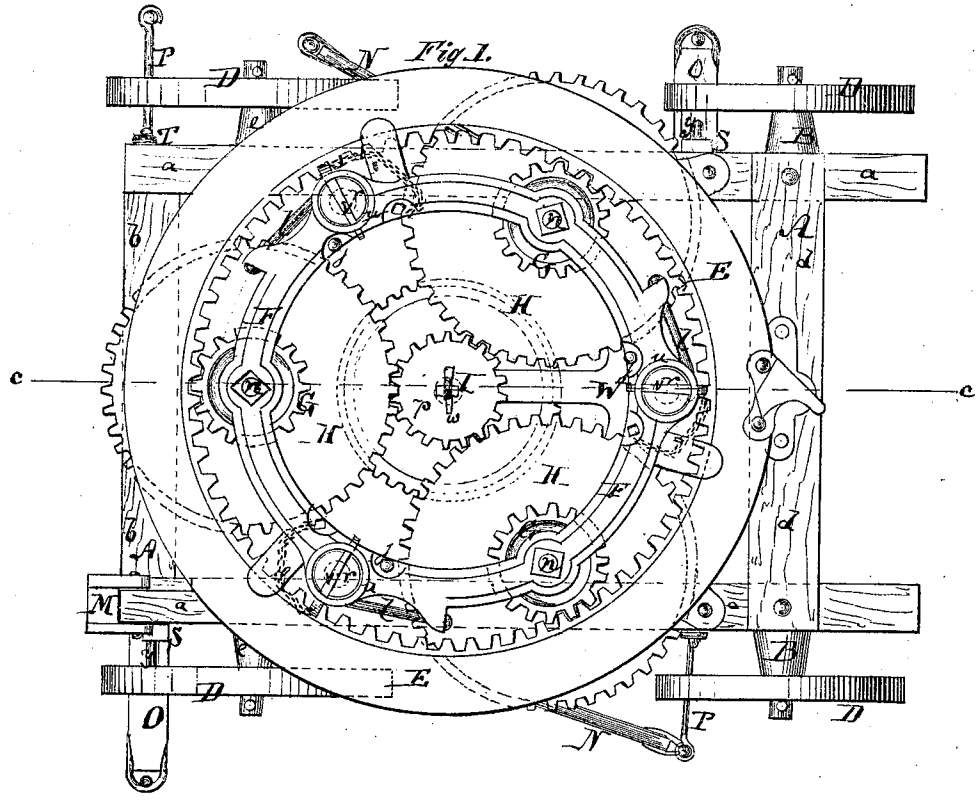
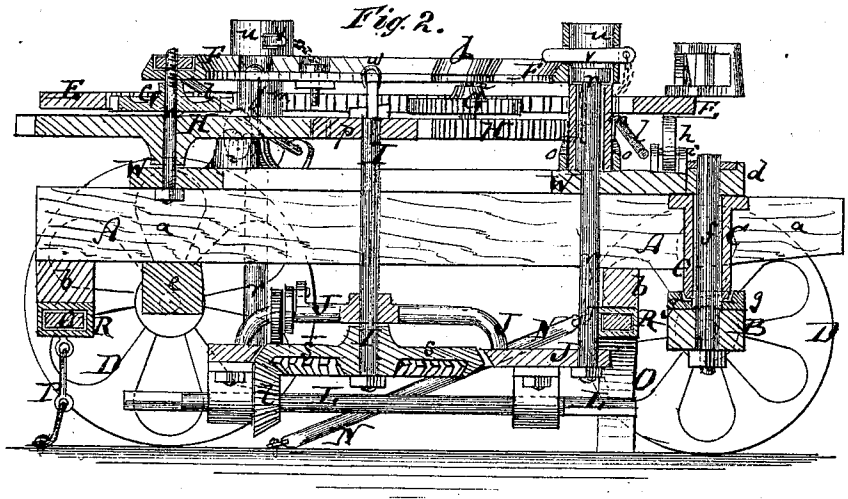


Fig. 2.



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2 Sheets--Sheet 2.

T. HARRISON & W. C. BUCHANAN.

Improvement in Horse-Powers.

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Fig. 3.

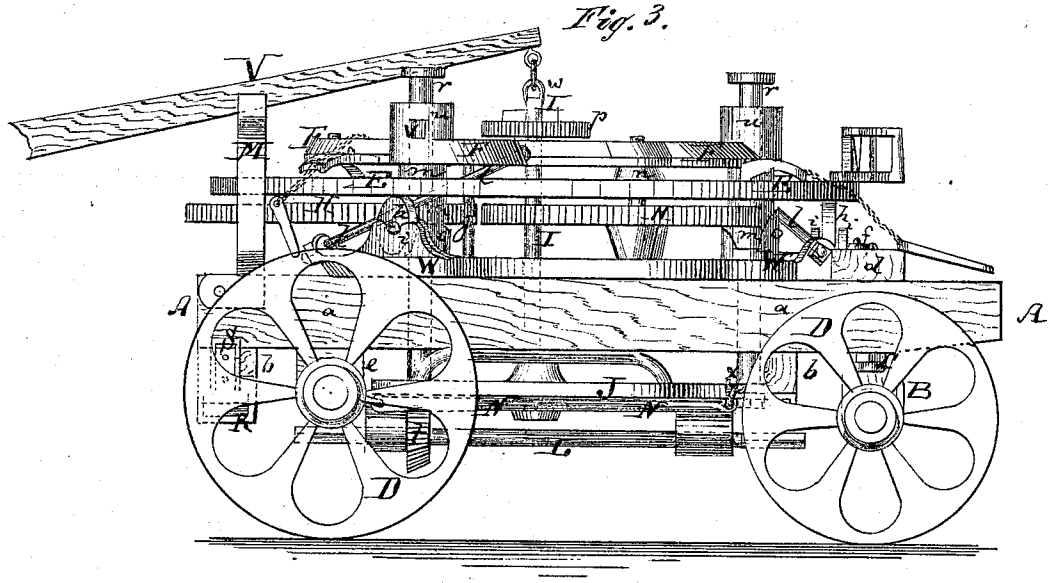
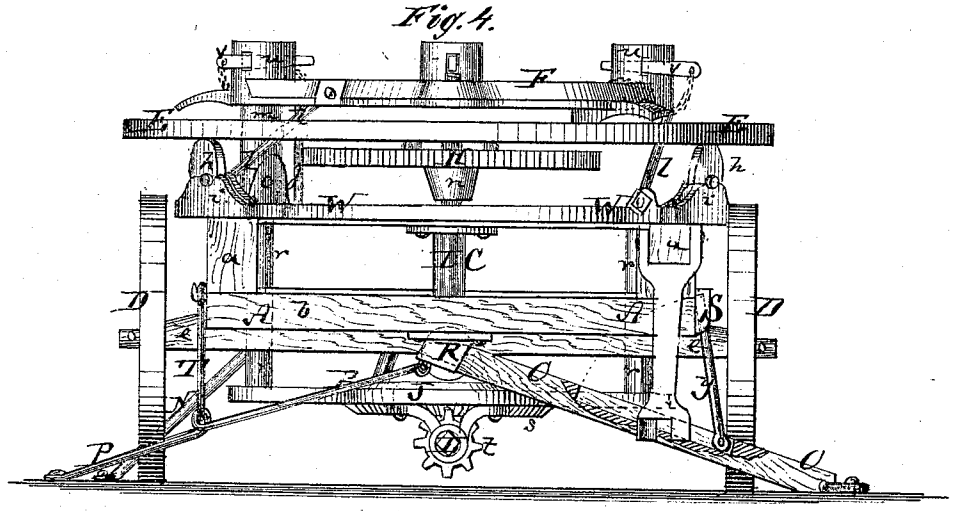


Fig. 4.



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UNITED STATES PATENT OFFICE.

THEOPHILUS HARRISON AND WILLIAM C. BUCHANAN, OF BELLEVILLE, ILL.

IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. 129,552, dated July 16, 1872.

Specification describing a new and Improved Horse-Power, invented by THEOPHILUS HARRISON and WILLIAM C. BUCHANAN, of Belleville, in the county of St. Clair and State of Illinois.

In the accompanying drawing, Figure 1 represents a top view of our improved horse-power. Fig. 2 is a vertical longitudinal section of the same on the line *c c*, Fig. 1. Fig. 3 is a side elevation, and Fig. 4 is an end elevation of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to several improvements of the horse-power for which Letters Patent of the United States were granted to us the 9th day of May, 1871; and consists, more particularly, in a new construction of frame-work and devices for supporting the rods and levers which brace the horse-power on the ground. The invention also consists in a new arrangement of the said rods and levers, which act as braces and also as supports of the vertically-adjustable bevel-wheel frame, and in various other details of improvement, as hereinafter more fully described.

A in the drawing represents the frame of the horse-power, consisting of two side rails, *a a*, two lower cross-bars, *b b*, one upper cross-bar, *d*, and a rear axle, *e*. B is the front axle, placed beneath the cross-bar *d*, and pivoted thereto by a pin or king-bolt, *f*. A tubular post, C, embracing the king-bolt and interposed between the front axle and the cross-bar or bolster *d*, serves as a support for the front part of the frame A, and is therefore made sufficiently strong to sustain the weight of the machine. The upper flanged end of the hollow post C is bolted to the under side of the bolster *d*, while its lower end rests in a socket which is formed in a plate, *g*, secured upon the axle B, so that the axle B can be turned to either side while the device is being transported. The supporting-wheels D D are hung to the ends of the axles *e* and B, respectively, as shown. By means of the post C, the bolster *d* is elevated so far above the axle B that the levers, which are supported on the frame during transportation, can rest on the cross-bars *b b* perfectly level and without being in the way of the upper bolster; while heretofore, when the bolster was directly on the top of the axle B, the levers had to project back of the machine, or else were tilted on the bolster, making transportation inconvenient. E is the annular driving-gear wheel, resting on friction-rollers *h h*, which hang in projecting ears *i i* of the lower bed-plate W, which is firmly secured to the frame A. F is the upper plate of the power, secured, by upright bolts *j*, diagonal bolts *l*, and tubular posts *m*, to and above the lower plate W. We attach great importance to the diagonal bolts *l l*, which are placed to resist displacement of the plate F in obedience to the strain of motion, for the arbor *n n* of the planet-wheels G and H, having their bearings in the plates W and F, are easily thrown out of position by the least displacement of the wheel E. All the strain of draft, however, is, by the wheel E, brought against the pinions G, and has the tendency to crowd them laterally and more or less displace the plate F. The diagonal braces *l l*, being placed against the direction of such strain, will effectually resist all displacement of the plate F. Should, however, nevertheless, a slight change of position take place either in the plate F or central shaft I, it can be easily rectified by tightening the nuts on some of the diagonal bolts and thereby shortening the bolts in the desired manner. The hollow posts *m*, which project downward from the plate F and rest on W, fit with their lower ends into sockets which are provided for their reception on the plate W, said sockets having projecting ribs *o*. When necessary, a packing of sheet metal or other material can be placed between the posts *m* and their respective adjoining ribs *o*, to get the plate F into any desired right position. The lower planet-wheels H gear into the pinion *p*, which is securely fastened to the central shaft I. This shaft fits with its upper part through a diagonal or central bar of the plate W, while its lower part turns in a frame, J, which is, by bolts *r r*, suspended from the upper plate F, and vertically adjustable. The bevel-wheel *s* for turning the pinion *t* on the power-shaft L is mounted upon the lower part of the shaft I. The bolts *r r* are placed so far from the central shaft I that they will be on a larger circle than the arbors *n n*, thereby giving greater steadiness to the bevel-wheel frame J than if they were on a smaller circle, in which case

the frame J would be liable to vibrate. The bolts *r* extend up through the tubes *m* and above the plate F into tubular projections *u* thereon. These projections *u* have holes in the sides for the admission of keys or wedges *v* or eccentrics, which, bearing on the upper ends of the bolts *r*, hold them down and secure the bevel-wheel frame and all its appendages perfectly rigid. The upper ends of the bolts *r* are headed, and support thereby the frame J on the shoulders within the tubes *m* or *n*, as shown. When the frame J is to be elevated with its appendages the keys *v* are withdrawn from the tubes *u*. It is evident that the suspending-bolts *r* can be round or of other suitable form in cross-section. We find it more preferable to firmly fasten the pinion *p* to the shaft I than to make it adjustable thereon. For elevating the bevel-wheel frame J one of the draft-levers V can be used. For this purpose a rest, M, forked on top to constitute the fulcrum for the lever, is pivoted to the frame A at one corner, and a small eye, *w*, formed on the upper end of the shaft I. The rest M is turned up into a vertical position when to be used, the lever rested upon it and hooked into the eye *w*, and swung to elevate the shaft I, and with it the entire frame J, with all appendages, the bolts *r* having been previously removed from the tubes *u*. In the elevated position the frame J is sustained for the transportation of the machine by rods N N, which are hinged to the front or rear cross-bar *b* and fastened to hooks *x* on the rear axle or front cross-bar, to be right under the bottom plate of the frame J, as in Fig. 3.

When the machine is in operation the rods N can be anchored with their free ends to the ground to serve as braces for holding the entire machine steady.

For further staking the machine to the ground other braces, O and P, are made use of. The braces O are rigid bars fitted with their upper ends into sockets R, which are secured to the cross-bars *b*, while their lower ends are fastened to the ground. Every bar O has a projecting brace, *y*, which bears against a socket, S, at the side of the frame A, as shown in Fig. 4, and which serves to hold O steady. The braces P are hinged to the cross-bars *b*, and also secured in the ground at their lower ends, and have projecting braces T, which are connected with hooks at the sides of the frame A, as shown. While the braces O are thrust the braces P are tension bars for holding the machine entirely steady.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. Hollow flanged post C and king-bolt *f*, arranged with the bolster *d* and axle B, as shown and described, for the purpose specified.

2. The upright bolts *j'* and diagonal bolts *l*, arranged with fixed plate, as shown and described.

3. The compound thrust-brace, consisting of the parts O *y*, pivoted and arranged with the frame of the horse-power, as specified.

4. The diagonal bolts *l l* applied to the upper plate F, substantially as and for the purpose herein shown and described.

5. The tubular posts *m* on the plate F, in combination with the projecting ribs *o* on the plate E, as specified.

6. The keys or eccentrics *v* applied to the tubular projections of the upper bed-plate F, to hold the bolts *r* down and lock the frame J, as set forth.

7. The bed-plate F, provided with the tubular projections *u u*, which are perforated for the reception of the keys *v*, as set forth.

8. The combination of the arbors *n n*, plates E F, and bolts *r r* with each other, when the bolts are placed on a larger circle than the arbors, as specified.

9. The combination of the eye *w* on the shaft I with the forked rest and lifting-lever, as set forth.

10. The rods N N pivoted to the frame A, to serve as supports for the elevated frame J, and also as braces for the machine, as set forth.

11. The compound tension-brace P T applied to the portable horse-power, as set forth.

12. The frame A provided with the sockets R and S, for the reception of the thrust-braces, as set forth.

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