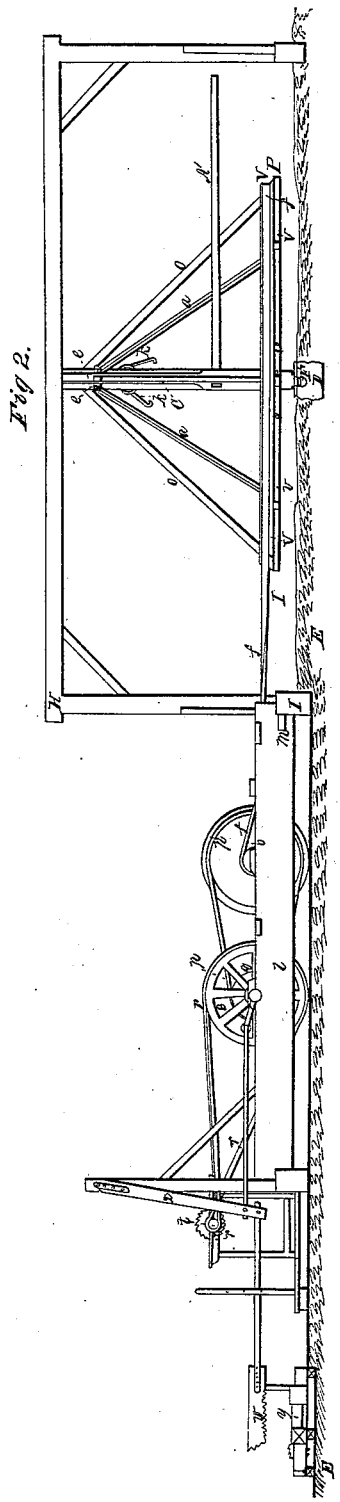
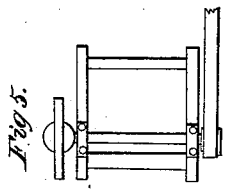
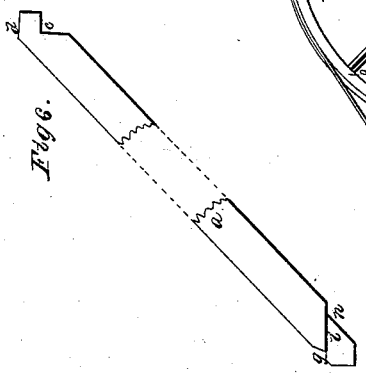
L. S. Rand,

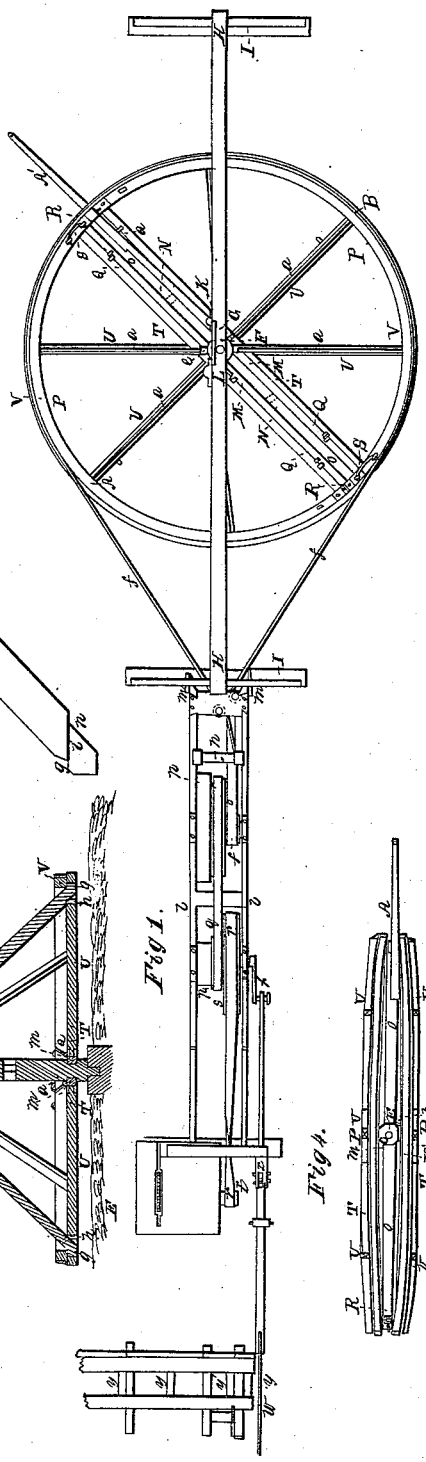
Horse Power.

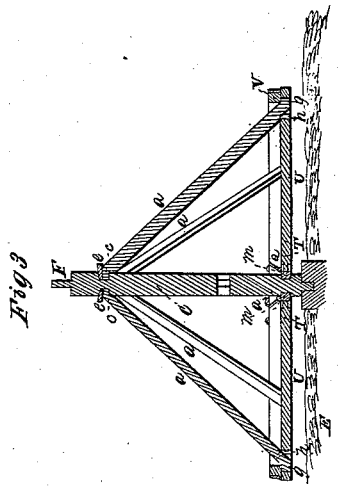
No. 2,992. Patented Mar. 4, 1843.

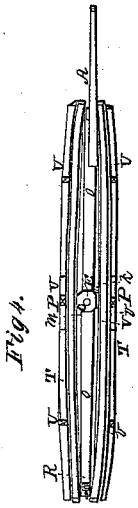












UNITED STATES PATENT OFFICE.

LUKE S. RAND, OF TOWNSHEND, VERMONT.

IMPROVEMENT IN HORSE-POWERS FOR DRIVING MACHINERY.

Specification forming part of Letters Patent No. **2,992**, dated March 4, 1843.

To all whom it may concern:

Be it known that I, LUKE S. RAND, of Townshend, in the county of Windham and State of Vermont, have invented new and useful Improvements in Horse-Powers, or in the main or driving wheel of the same; and I do hereby declare that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein are set forth the nature and principles of my said improvements, by which my machinery may be distinguished from other kinds for a similar purpose, together with such parts or combinations as I claim, and which I wish to have secured to me by Letters Patent.

The great objections to the horse-powers which have heretofore been devised are, first, their extreme cumbersomeness, by which they occupy more space than can be conveniently spared, and which also renders them stationary, as it were, or makes it impracticable to carry them from one locality to another; and, secondly, the great expense or cost of the same, which makes them rare in a neighborhood, or prevents those who are in want of such a machine from possessing the same.

By my improvements I produce a horse-power which is exceedingly cheap, being simple in its construction, and so arranged as to be portable or capable of being easily transported from place to place, to perform any of the various operations of sawing, grinding, &c., the occasions for which are so frequent in agricultural districts, so that, in fact, my apparatus, instead of being styled a machine, may rather be considered as a common farming or mechanical utensil or implement, which all who may have occasion to use may possess.

The figures of the accompanying plate of drawings represent my improved apparatus. Figure 1 is a plan of the machine. Fig. 2 is a side elevation. Fig. 3 is a vertical section taken on the line A B, Fig. 1; while Fig. 4 represents the driving-wheel folded up, as it were, the provisions for which will be hereinafter explained, Fig. 5 being a detailed view of an emery-wheel or grindstone, which may be connected to the apparatus.

It will be seen, as, indeed, I have before intimated, that my improvements are principally in the main part of a horse-power or the driving-wheel of the same, to which the horse or other animal is connected.

C, Figs. 2, 3, 4, is the main vertical shaft, having a metallic journal, F', at its lower end, which rests and revolves in a suitable bearing or step in the block D, which should be firmly embedded in the earth E E, as shown in the vertical section in Fig. 3. The upper part or end of the shaft C has also a suitable wooden or metallic journal, F, which is supported and turns in a proper box or bearing, G, in the longitudinal beam H H of the standard frame I H H I, which is properly strengthened by diagonal braces, as seen in the several drawings, and the parts I I of which should be properly weighted or embedded in the earth, so as to keep said standard frame stationary when the machine is in use. The box G is constructed with a hinge, K, and with a button, L, so that the shaft C, with the parts connected to the same, may be easily removed from its bearings and laid aside.

M M are two string-pieces or timbers firmly attached, in any convenient manner, to the bottom of the shaft C, as shown in Fig. 1, said shaft being suitably cut away or mortised out for the purpose, as shown in Fig. 3, and cross timbers or joists N N (shown by dotted lines in Fig. 1) being properly arranged between them, for the purpose of giving additional strength.

O O are two diagonal braces, the upper ends of which are firmly connected to the top of the shaft C by suitable mortises and tenons, while their lower ends are securely fastened between the string-pieces M M in any proper manner and near the ends of the same, as shown in Figs. 1, 2, and 4. Segments of wheels P P are hinged by proper hinges, Q Q Q, Fig. 1, to each of the string-pieces M M, so as to form with the hinged blocks R R (which serve in part, when fastened down with the hooks and loops at S S, to keep the segments horizontal) an entire wheel. These segments of wheels P P are each formed of the following parts, viz: string-pieces T T (on which the loops of the hinges are arranged, and which, when the wheel is horizontal, are in close proximity with the exterior sides of the string-pieces M M) and radial arms or spokes U U U, &c., the inner ends of which are suitably mortised into the exterior sides of the string-pieces T T, while

on the top faces of their outer ends the felly or periphery V V V of the wheel is supported and secured. In addition to the hinged blocks R R and hooks and loops at S S, for keeping the wheel-segments P P horizontal, diagonal, or radial, braces *a a a* extend from each of the radial arms or spokes U U U, near their ends and inside of the periphery *r r r*, to the main shaft C near its top. Suitable mortises, *b b b*, are formed round the shaft C near its top, as shown in Fig. 3. The upper ends of the braces *a a a*, &c., are formed with angular notches *c c c*, &c., on their under sides, their tops being beveled off, as shown at *d*, Fig. 6, which is a detail view of one of the braces *a*. The short sides of the notches *c c* rest on the bottoms of the mortises *b b b*, (which incline downward a little, as shown in Fig. 3,) while the long sides brace against the several faces of the main shaft C, the wedges *e e e* serving to confine the above-described peculiarly-shaped ends of the braces *a a* in the mortises *b b*, &c., of the shaft. The lower ends of the radial braces *a a a* have also a peculiar shape, as shown in Figs. 3 and 6, which, as will be shown, is for the purpose of counteracting any tendency which the wheel-segments P P may have to spring up or down when the band *f f* is in its place and the wheel is revolving. This peculiar shape is exhibited more particularly in Fig. 6, and consists of a notch, *g*, on the upper side and a notch, *h*, on the lower side, and a diagonal ledge or shoulder, *i*, which is formed by making the arms *a a* thinner here than at other parts. The notches *g* on the upper side of the arms *a a*, &c., press against the under and inner side of the periphery V V of the segments P P, and counteract any tendency which they may have to fly or turn downward, while the opposite tendency or the danger of their flying or turning up when revolving is corrected or prevented by the lower notches, *h*, and the ledges or shoulder *i*, which press against or upon the upper sides or faces of the radial arms or spokes U U U of the segments P P.

The horse or other animal motor power is connected to the horizontal beam A′, which is arranged in the usual manner, or as seen in Figs. 1 and 2.

It will be seen that by the above-described construction and arrangement of the radial arms *a a*, &c., great strength is given to the horizontal wheel, while at the same time they may be removed with greater facility than any other kind from their places, so that when the hinged blocks R R are unhooked and turned up or over upon the periphery V V of the wheel the hinged wheel-segments P P may be turned up by the sides of the shaft C, as shown in Fig. 4, being confined in this position by the hooks and loops seen at *k k* in said figure. Thus it will appear that the wheel, which is the principal part of the horse-power, may be removed from its bearings and placed away so as to occupy but a very small space.

In order to show the application of my improved wheel, I have exhibited in my drawings a portable apparatus for sawing in various ways, which I shall proceed to describe, though very generally, as it contains no material novelty or improvement, and as it will be evident that any of the various kinds of mills used by farmers or mechanics may be substituted for the same.

The frame-work *l l*, which supports the operative parts of this sawing apparatus, is secured to the bottom of the standard frame I H H I by the wedges *m m*, Fig. 2.

The band *f f* from the driving-wheel passes under the inclined roller *n* (which sways it from the vertical to the horizontal position) and around a pulley of the cone of pulleys *o*, Fig. 1. From one of these pulleys another band, *p p*, passes to and around a pulley or drum, *q*. Another or twisted band, *r r*, passes from a wheel, *s*, Figs. 1 and 2, on the same shaft with the pulley or drum *q*, to and around the pulley *t* on the same shaft with the circular saw *n*, which serves for slitting and sawing timber into boards in the usual manner. A crank, *v*, on the end of the shaft, on which are arranged the drum *q* and wheel *s*, imparts a vibrating or reciprocating rectilinear motion to the horizontal saw *w*, through the medium of the vibrating or pendulous beam *x*, said saw *w* serving to separate timber or trees into logs, and said trees or timbers being fed or moved up to it on the feed-rollers *y y y*. (Shown in Fig. 1.)

The whole of the above specified apparatus, it will be apparent, may be separated into its several parts and transported in a common horse-cart to any desired location, and there set up in a half an hour, ready to perform any work which may be arranged for it.

Having thus described my improvements I shall claim as my invention—

Constructing the main or driving wheel of a horse-power in two hinged segments arranged on each side of the driving-shaft, so that the wheel may be folded up in a compact and portable form, said segments being confined in position or kept horizontal when the wheel is revolving by means of the hinged blocks R R, hooked down, as herein above described, and also by radial diagonal braces arranged between the driving-shaft and said hinged segments, the whole being constructed and operating substantially as hereinbefore specified.

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this 6th day of December, 1842.

LUKE S. RAND.

Witnesses:

OSCAR F. BUTTERFIELD,
SAML. F. THOMPSON.