G. E. Burt,

Horse Power.

No. 37,892. Patented Mar. 17, 1863.

Fig. 4.

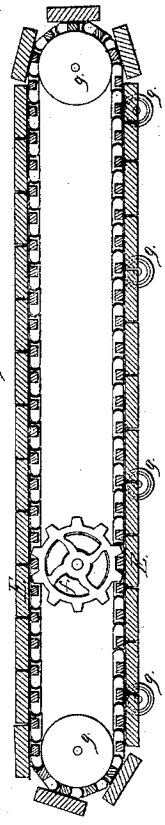


Fig. 1.

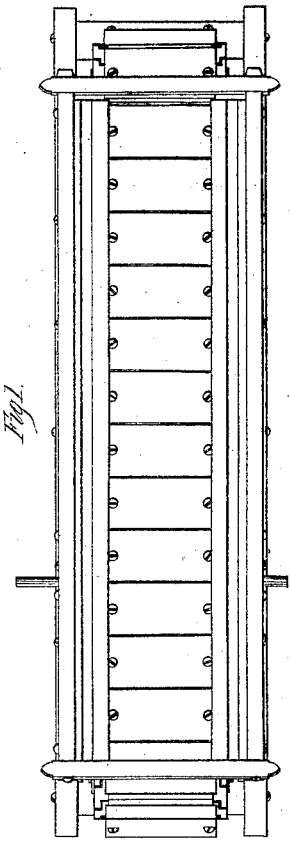


Fig. 2.

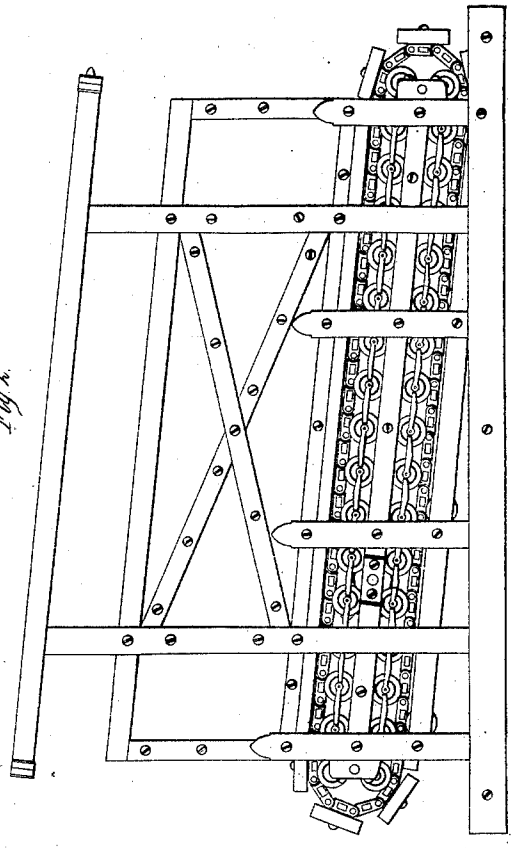


Fig. 7.

Fig. 6.

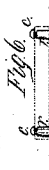


Fig. 5.

Fig. 3.

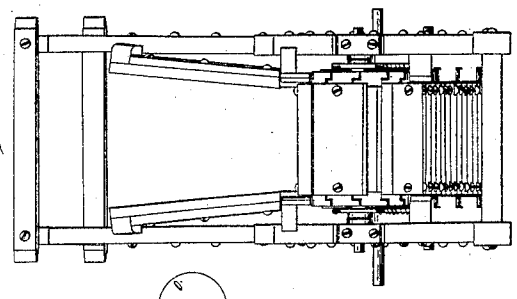


Fig. 8.

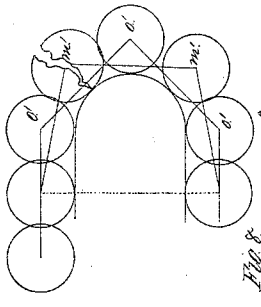
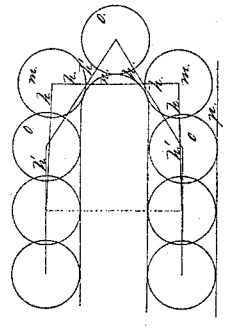


Fig. 10.



Inventor;
George E. Burt

UNITED STATES PATENT OFFICE.

GEORGE E. BURT, OF HARVARD, MASSACHUSETTS.

IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. **37,892**, dated March 17, 1863.

To all whom it may concern:

Be it known that I, GEORGE E. BURT, of Harvard, county of Worcester, State of Massachusetts, have invented a new and Improved Mode of Constructing Horse-Powers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a top view or plan. Fig. 2 is a side elevation of the machine complete, represented with the platform-chain resting on the periphery of the supporting rolls. Fig. 3 is an end view. Fig. 4 is a transverse section through the center of the machine, showing the driving-gear cogging into the endless platform-chain, also showing the position of the stationary rolls that support the return of the endless platform. Fig. 5 is a top view of a detached section of the endless platform, representing one under tread and two links. Fig. 6 is an end view of a detached section of the endless platform, with two links showing the projecting boss. Fig. 7 is a top view of the supporting-chain with roll showing the connecting-bar. Fig. 8 is a diagram showing the supporting-rolls in two extreme positions, and the angles of the connecting-links on the end track. Fig. 9 is a diagram showing the supporting-rolls in two extreme positions with the links at right angles, showing the deficiency of the tension of the chain in the different positions on the end track. Fig. 10 is a diagram showing the supporting-rolls and chain-links in two extreme positions on the end track, also showing the combination of length of link and diameter of end track and supporting-rolls and their angles, so constructed as to pass the end track with the same tension of chain.

Like letters represent like parts.

The nature of my invention consists in constructing endless chain horse-powers in such a manner that the connecting-chain links of the moving platform shall be kept firmly in their proper position by a hollow boss or tube passing nearly through the tread-wood, and thus relieving the tread-bolt in a great measure of its strain; also, by placing the driving-gear directly under the horse and having the gear cog into both the upper and under gears of the moving platform; also, making the connecting-links of the supporting-rolls connected at or near their center, by which device the rolls are guided more perfectly in their track; also, making such length of link to the supporting-rolls and diameter of the semi-circle or end track, that the sections of the endless chain may pass the semi-circle track at an acute angle without causing a jerking or irregular tension. By this device we are enabled to construct horse-powers with a less number of supporting-rolls and connecting-links, making the machine much lower at the rear end, thus saving in cost.

The most of these improvements may be used on machines constructed with the supporting-rolls pivoted directly to the platform-chain.

It is well known that the bolts that attach the wood treads break and get loose, caused by the continual strain and jar of the horse traveling on them. To obviate this difficulty I have a hollow boss cast on the chain-link that passes nearly through the wood tread and takes the strain of the horse and serves also to keep the iron link firm and level. This is shown in Figs. 5 and 6.

a is a link with projecting boss *r*, which passes nearly through the wood tread, represented by the dotted lines.

c is the screw that holds the tread on the boss.

On all endless-chain machines there is a loss of power in getting the sections of the chain around the end track, and the loss increases as the angles of the chain are increased. To overcome this difficulty I construct my machine with the drive-wheel so as to gear both into the top and bottom of the moving platform, by which device the angles of the chain on the end track are relieved of the labor of drawing the platform up the inclined plane. This is shown in Fig. 4.

E is the moving platform-chain. *f* is the drive-wheel. *g* is the stationary supporting-wheels for the return-platform when it is supported on periphery-rolls. It will be seen as the horse propels the top of the drive-wheel that the bottom will propel the returning platform-chain with less loss of power than it would require to draw it around the end track with any considerable angle of chain-links.

There has ever been serious difficulty in running horse-powers on the periphery of sup-

porting-rolls, by reason of the connecting-links of the rolls and the pivots on which the rolls turn becoming worn, therefore allowing one side of the link to get in advance of the other and the rolls to get out of a right line with the platform-chain which they support, and consequently throwing it off the rolls and out of its track. My method to overcome this is to have the links of the periphery-rolls constructed with a firm connection between the wheels, holding both sides of the connecting-links in place. This is shown in Fig. 7.

h h are connecting-links; *i*, the pivot; *j*, the bar that holds the links firmly together and the pivot at right angles with the links.

It is necessary that portable horse-powers should be as low as possible at the rear end. Therefore it is desirable to pass the links to the supporting-rolls around the end track at the most acute angle practicable, whether they are pivoted to the platform or otherwise, and at the same time to avoid irregular tension of chain.

The operation of the machine with these improvements is as follows: By the device of the cog-wheel *f*, cogging into the endless platform, both at the top and bottom, and being placed under the horse when the horse propels the upper portion of the endless platform, the cog-wheel *f* propels the under portion of the endless platform on the straight track, and thereby entirely relieving the connecting-joints of all the strain and friction caused by the labor of the horse while the sections are at angles passing the end track; also, the power is given directly to the top of the gear-wheel *f* always at the same point, by which means the horse gives more effective power, and by the device of the combination the chain-link and diameter of end track and supporting-roll, as shown in Fig. 10, so operates as to give a free and regular motion and equal tension to the chain in all its positions in passing the end track. This is shown by the different positions of the chain-links *h h h h* and rolls *m m* in one extreme position and links *h' h' h' h'* and rolls *o o o* in the other position, and it will be seen the tension of the chain is the same in both positions, the rolls resting on the end track, *n*, and entirely overcoming the variation of tension of chain which occurs when the length of link is such as to pass the end track at a right angle, as shown by the fracture in roll *m'* in Fig. 9, which represents the usual mode of constructing horse-powers; but by this device the chain passes the end track at a more acute angle, making a saving in the height of the machine. It also brings the upper and lower parts of the endless chain nearer together, by which means the driving-cog *f* is of less diameter, consequently giving more speed. The projecting boss *r* in Fig. 6 holds the link firm in its position and relieves the bolt that secures the wood-tread to the link from unequal strain. When the endless platform is supported on the periphery of the supporting-rolls, the rolls are guided in their proper track by the links *h h* and bar *j* in Fig. 7 and flanges on the supporting-rolls and track. The stationary wheels *g* in Fig. 4 support the return or bottom portion of the endless platform; but when the platform is supported on axles the rolls are pivoted directly to the endless platform, as is shown in Fig. 10. The supporting-rolls so attached will support the endless chain both at the top, bottom, and end tracks. It will be seen by giving motion to the endless platform at the top the cog wheel *f* will propel the endless platform up the inclined plane of the bottom track, *p*, and round the end track, the endless platform being sustained by the supporting rolls, and the sections passing the end track with a smooth, regular motion, avoiding the usual jerking motion of the commonly-constructed horse-powers, which is very straining to the machine and wearing to the horse employed on them, consequently a loss of power.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The projecting boss *r*, in combination with the link *a*.

2. The combination of the cog-wheel *f* and the endless platform, arranged in the manner and for the purposes set forth.

3. The connecting of the links *h h* by the bar *j*, for the purpose described.

4. The combination of the link *h* with the supporting-rolls and end track, constructed and operating substantially in the manner specified, and for the purposes set forth.

GEORGE E. BURT.

Witnesses:

JAMES M. BARRY,

AUG. G. HILL.