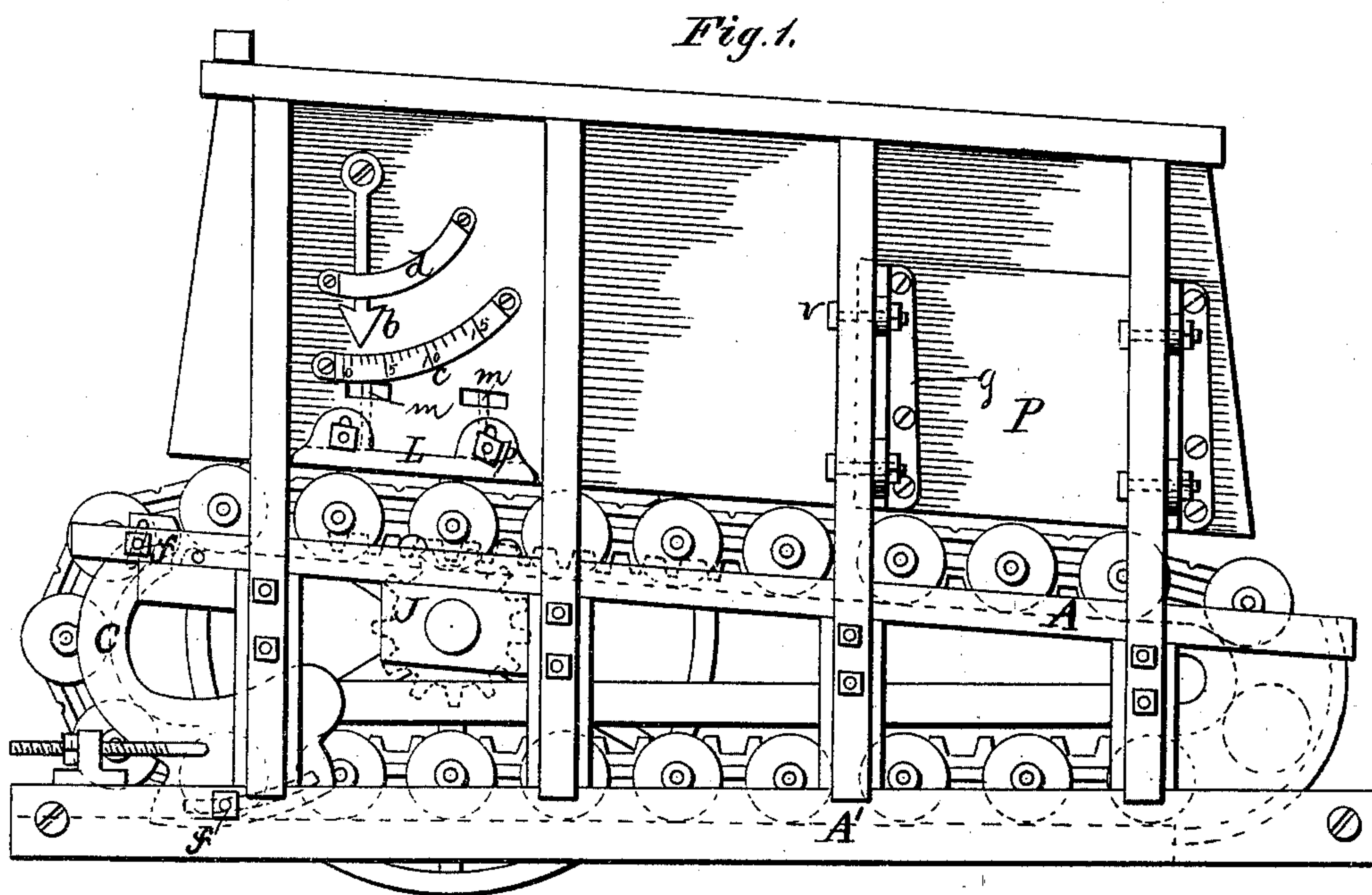


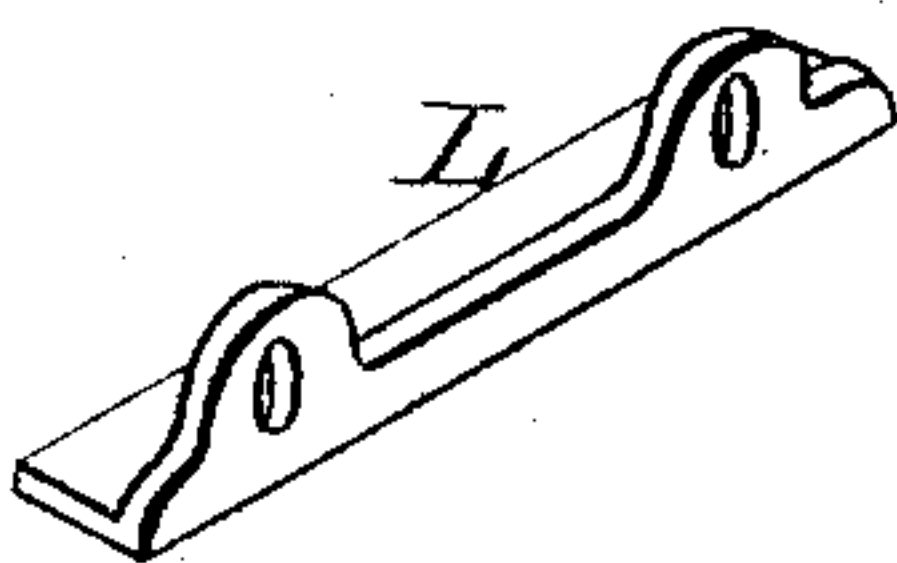
W. H. BUTTERWORTH.  
HORSE-POWER.

No. 171,094.

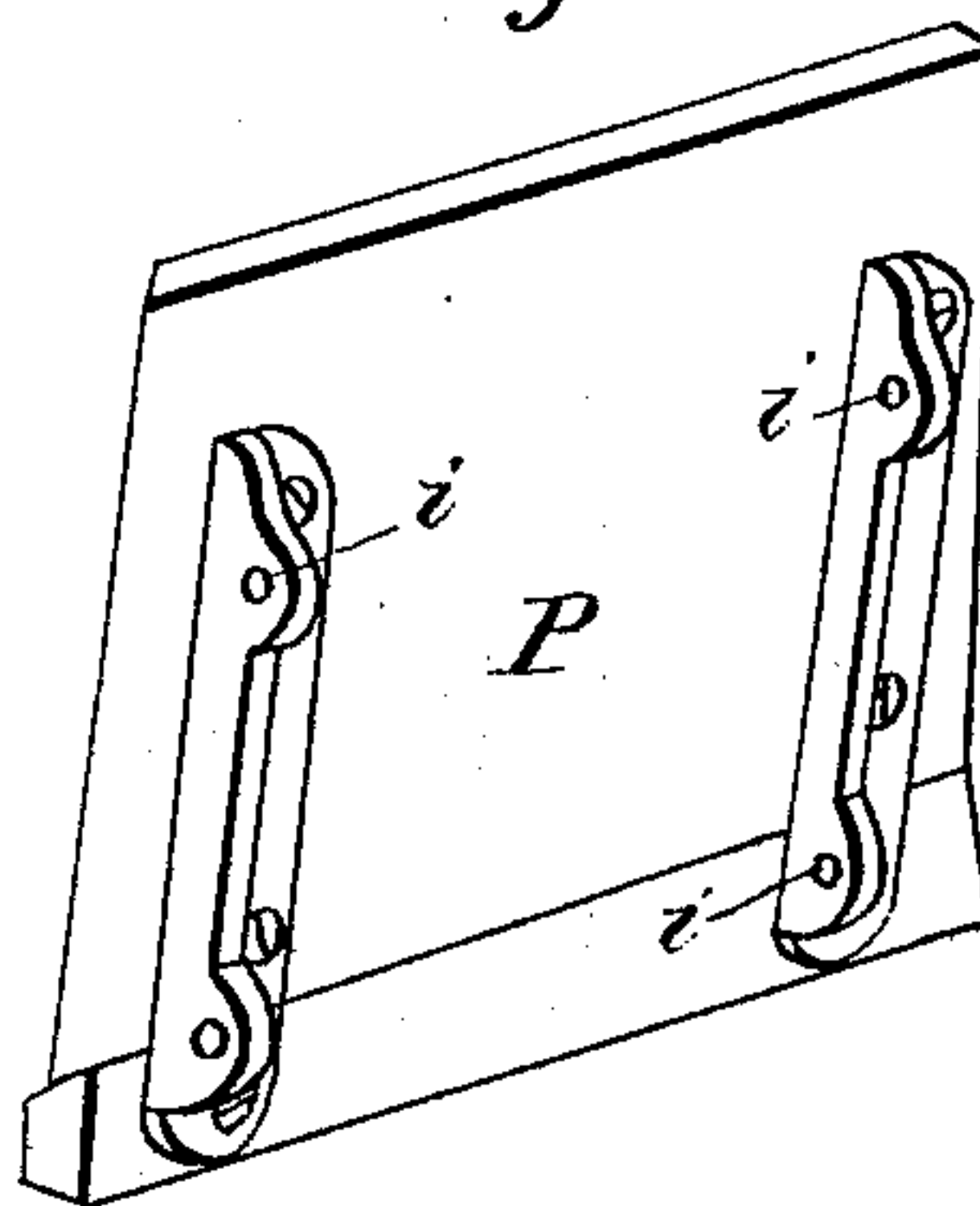
Patented Dec. 14, 1875.



*Fig. 6.*



*Fig. 7.*



WITNESSES

*Henry N. Miller*

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By

INVENTOR

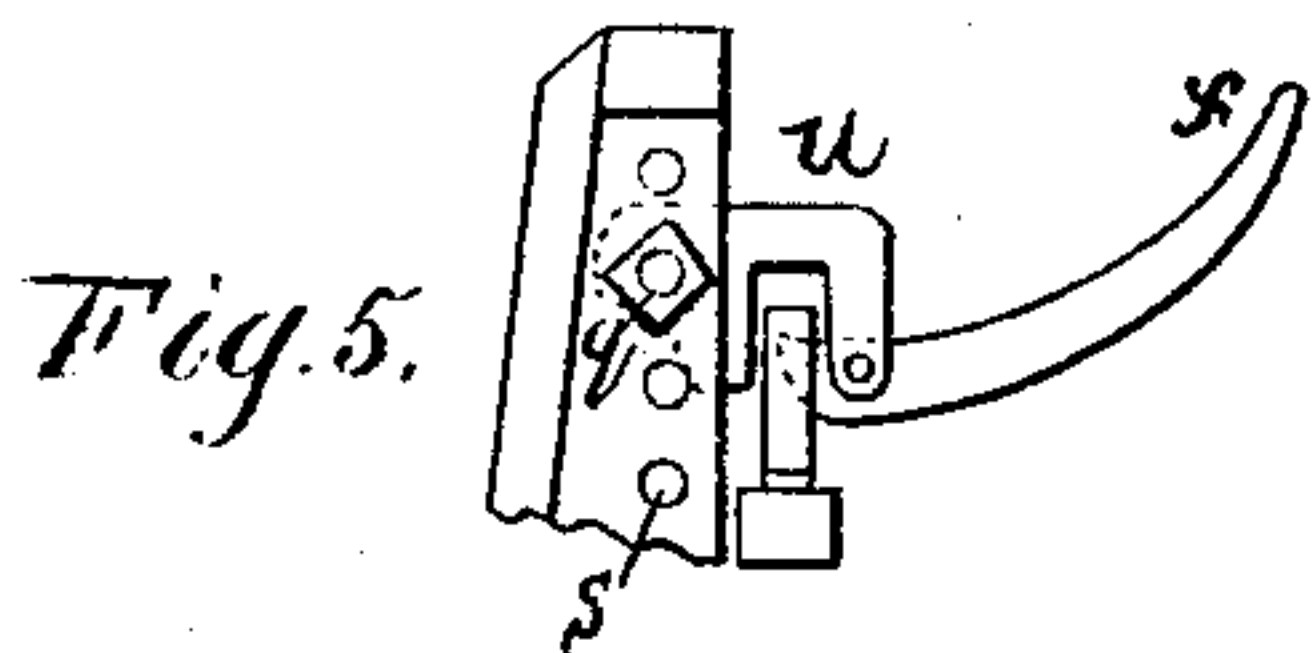
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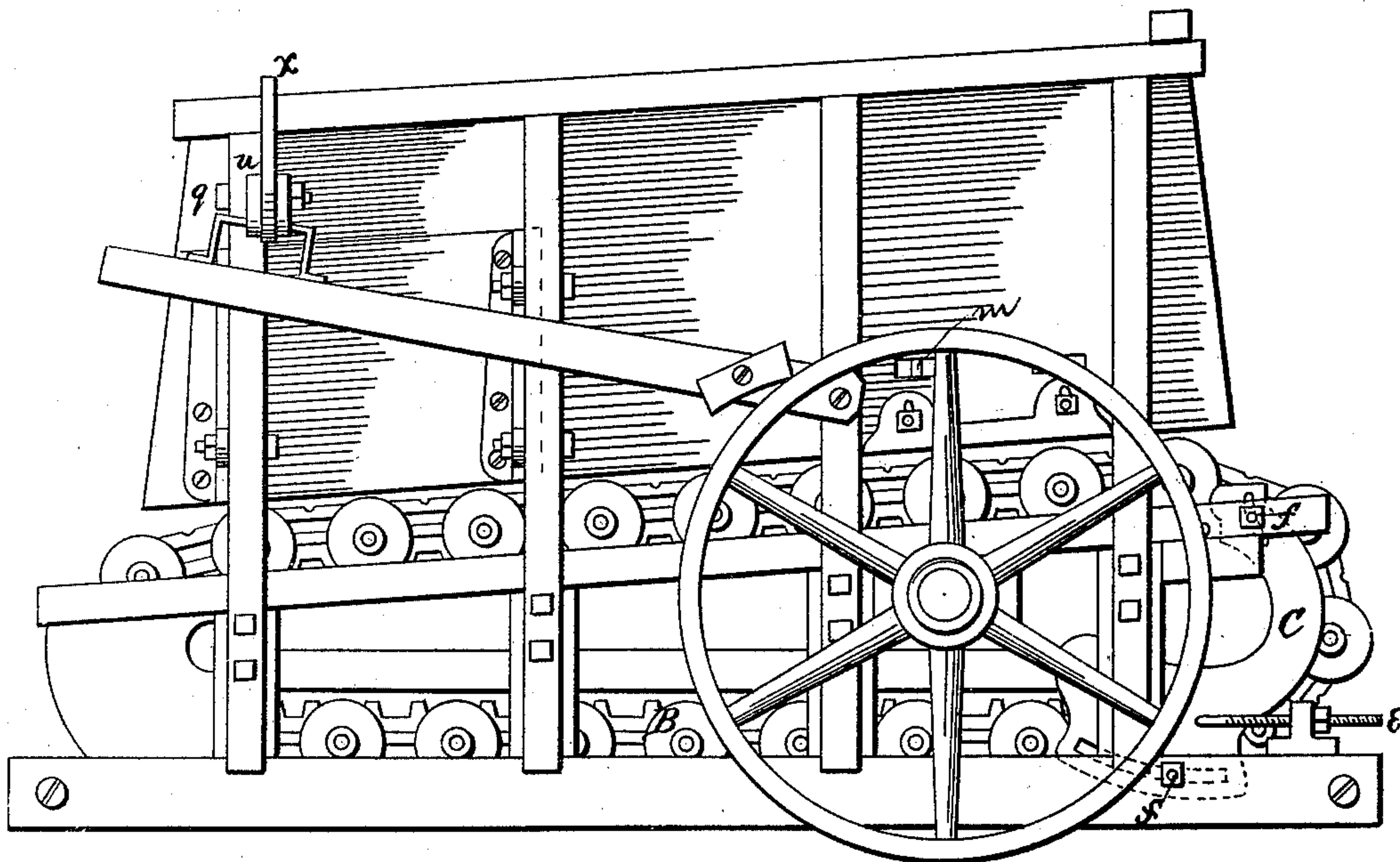
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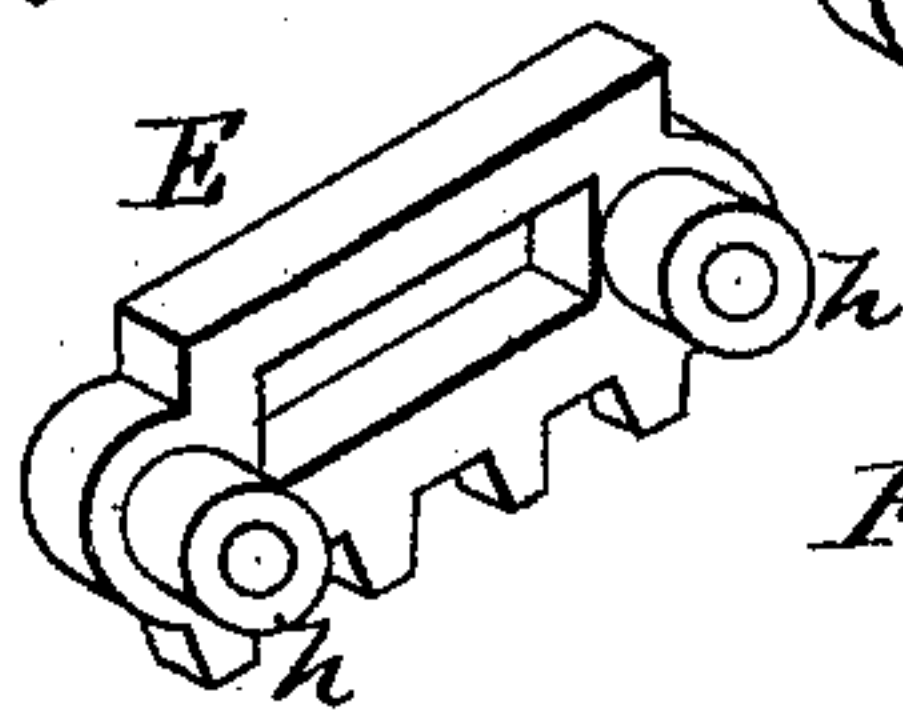
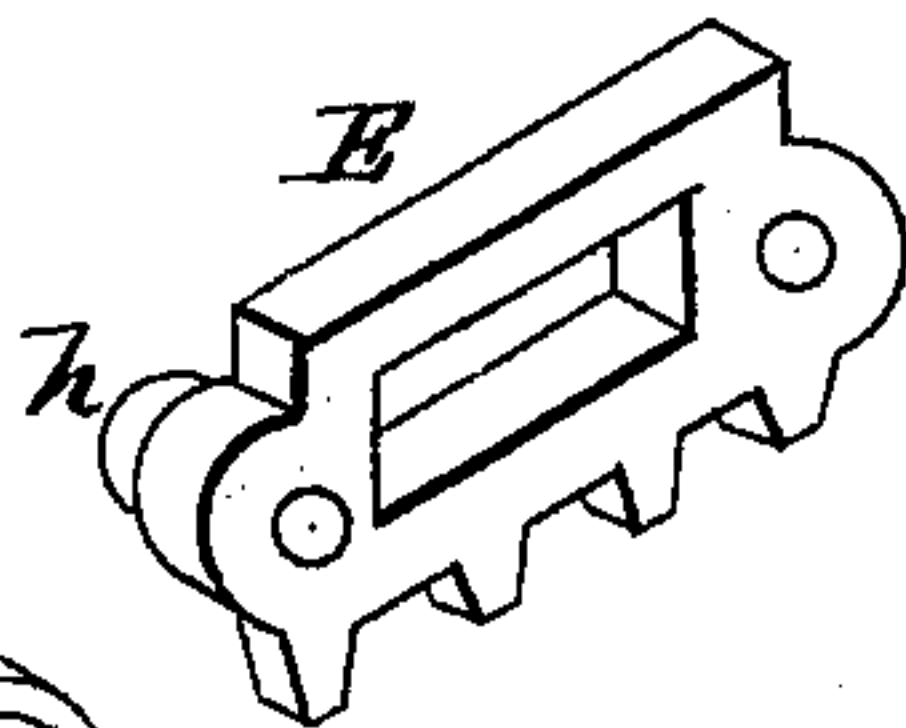
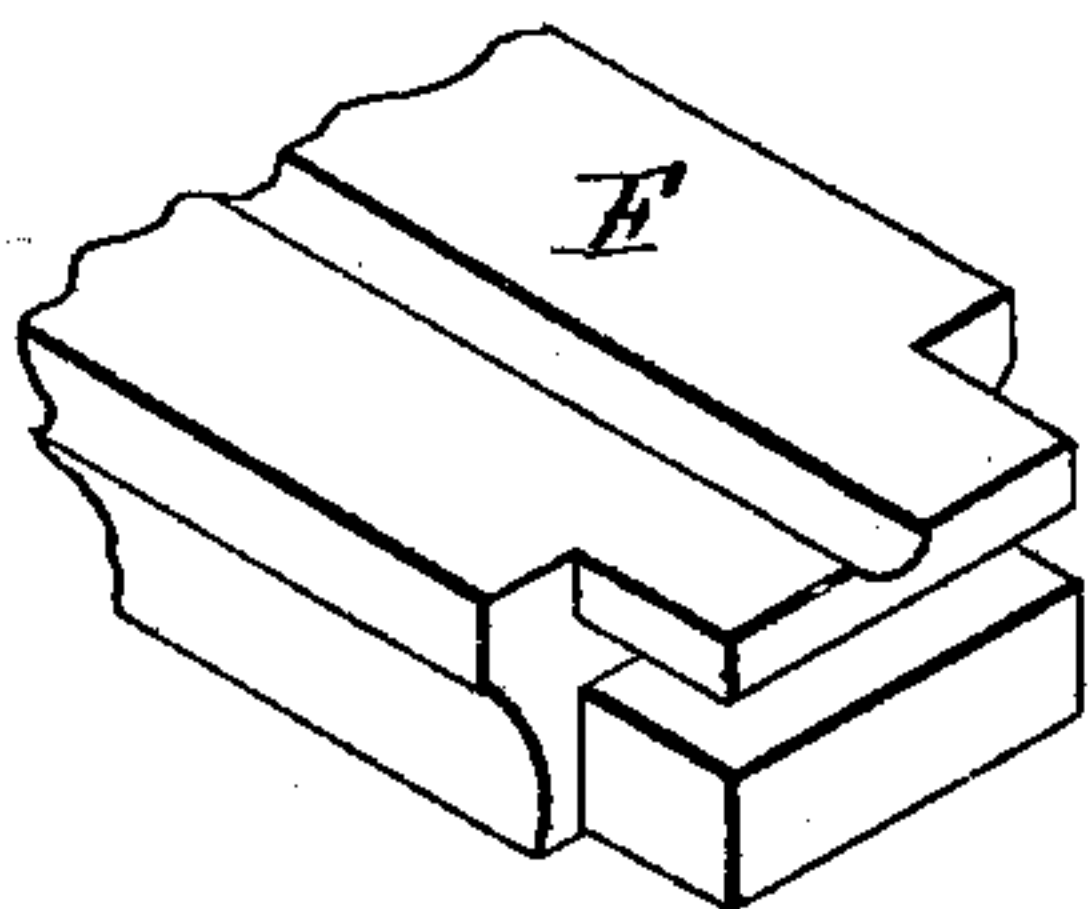
Patented Dec. 14, 1875.



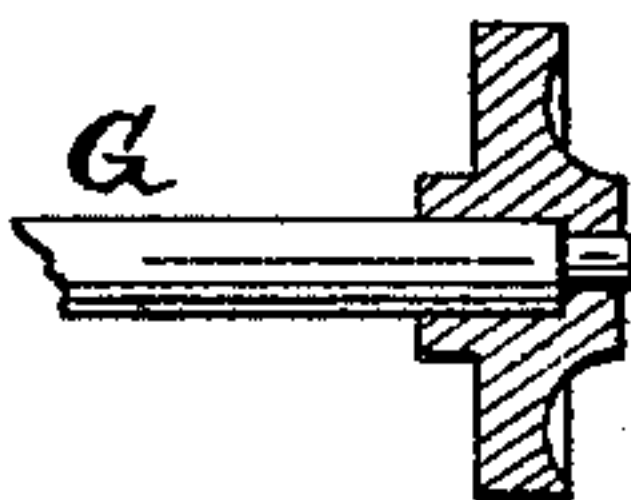
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

WILLIAM H. BUTTERWORTH, OF TRENTON, NEW JERSEY.

## IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. 171,094, dated December 14, 1875; application filed August 11, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM H. BUTTERWORTH, of Trenton, in the county of Mercer and in the State of New Jersey, have invented certain new and useful Improvements in Horse-Powers; and 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, making a part of this specification.

My invention relates to that class of horse-powers known as endless-chain or railway horse-powers; and it consists, first, in the peculiar construction and arrangement of the curved portion of the track, whereby not only a very minute and perfect adjustment to the length of the endless chain is obtained, but also the serious difficulty heretofore encountered in this class of horse-powers in the performance of this function is entirely overcome; second, in the construction of the links which compose the endless chain, whereby great durability and strength are increased with but very little additional weight or expense; third, in the arrangement of the guard-plates for holding the links of the endless chain in gear with the pinions on the main shaft, whereby the said guard-plates are made adjustable to compensate for wear or shrinkage, and the manner of applying the same to the side of the horse-power, so that it can be adjusted to suit the belt when the horse-power is set at different inclinations; fourth, in the peculiar construction of the brake-trip; fifth, in the construction of an indicator for the purpose of pointing or indicating the degrees of elevation at which the horse-power sets.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of a horse-power embodying my invention. Fig. 2 is a side elevation, showing the opposite side of my improved horse-power. Figs. 3 and 4 are detached views of certain parts thereof.

In constructing my horse-power I make a frame in the usual manner. At each side of this frame is placed the railway or track A A',

on which the wheels B of the endless chain roll. The curved portions C of the track are made adjustable, so as to compensate for wear of the endless chain.

The construction and manner of adjusting this portion of the track enable the operator to keep the endless chain at the proper tension at all times, which have heretofore been the serious difficulty and great objection to this class of horse-powers.

This curved section C has an axis on a plane with the track A, and is constructed with a projecting arc, D, concentric with its axis. This feature allows the curved section to be moved on its axis without altering the relative distance between the projecting arc D and the track A', and on account of the axis being placed on a plane with the track A the curved section can be adjusted without causing an opening or aperture between the curved section and the track A.

The rod *e* is for the purpose of facilitating the adjustment of the curved section C, and the bolts *f f* are for the purpose of securing the said section after being adjusted to the length of the chain.

It is obvious that this curved section C can be applied to either end of the horse-power, and will also perform the same functions if used in an inverted position.

The endless chain is composed of a series of links, E, having cogs on their under side, and suitable openings or mortises to receive the lugs F. These links are coupled together by means of rods G, which extend through the links and receive the wheels B.

The construction of the links E is of such a form that the durability of both the rods G and links E is materially increased with but very little additional weight or expense.

It will be observed that each link is provided with bosses or projections *h h*, through which the rods G extend. These bosses are cast on and project from the sides of said links. The application of these bosses *h h* to the links not only adds to their durability, but also adds greatly to the durability of the rods G, thereby causing the endless chain to run with a steady and more uniform tension than heretofore.

The ends of the rods G, on which the wheels



B revolve, are turned smaller than the main part of the rods, so as to allow the ends of said rods to pass through the counter-bore of the wheels B, and also to form a shoulder on the rods, to prevent them from too much endwise movement when in operation.

By this arrangement of counterboring the wheels B and constructing the rods as above mentioned, I obtain the following very important and beneficial results, viz: A very superior and efficient mode of oiling the wheels and rods, preventing the escape of oil at the ends of the wheels, excluding dust and dirt from the bearings, and keeping the rods in their proper position when in motion.

The manner of applying oil to the inside of the wheels B is to push the rods G or withdraw the wheels B until the small ends of the rods are out of the counterbored parts of the wheels; then the oil can be applied, after which the rods or wheels are returned to their former position, and serve to prevent the escape of oil or the entrance of dust at the ends of the wheels B. This arrangement insures a perfect lubrication of these parts, very materially lessens the friction, adds greatly to the durability of the horse-power, and also prevents the rods from having too much endwise movement when in operation.

The wheels B are placed loosely on the ends of the rods G, and are prevented from running off the same by the construction of the track, which is made L-shaped, the vertical parts of the track keeping the wheels in position, while they are sufficiently removed from the wheels to allow of endwise movement to oil or lubricate the parts without the wheels coming entirely off from the rods.

The links E of the endless chain are held in gear with the pinions J J on the main shaft by means of the adjustable plates L L, which are made adjustable to compensate for wear and shrinkage. The plates are adjusted by means of set-screws m m, and are held in place, when adjusted, by means of bolts p p.

The brake-tip consists of the angular plate u and bent arm x. This bent arm is pivoted to the angular plate u, and is held in a horizontal position by means of the brake being hung on its inner end. The construction of the angular plate u admits of it being applied to either side of the horse-power. This brake-tip is attached to the side of the horse-power by means of the bolt q, and is made adjustable to suit the different positions of the main belt by means of the series of holes s s to receive the bolt q.

To the side of the horse-power is attached an indicator, for showing the elevation at which the horse-power is set. It consists of the pointer b, graduated curved plate c, and the protector or shield d.

The pointer b is suspended loosely from a screw or pivot in the side of the horse-power, and when the front end of the horse-power

is elevated, this pointer retains its perpendicular position, and indicates, by reference to the figures and marks on the curved plate c, the number of degrees of elevation at which the horse-power sits. The shield d is for the purpose of protecting the pointer b and preventing too much side movement of the same.

A portion, P, of the sides of the horse-power is movable, to allow replacement of broken or worn-out parts of the endless chain without the necessity of removing the entire side. This part of my invention consists in the manner of holding the said movable portion in position, and is accomplished by the peculiar construction of the plates g g and the beveled end of the movable portion P.

It will be observed that the plates g, which are attached to the movable portion P, are provided with slotted holes i, through which the bolts v pass. These slots are for the purpose of allowing the removal of the portion P from the side without the necessity of removing the bolts v. The ends of the movable portion P are beveled, and fit in a corresponding bevel in the side of the horse-power.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the railway or track A A', of the curved adjustable section C, constructed substantially as and for the purposes herein set forth.

2. In an endless-chain horse-power, the links E, provided with the projections or bosses h h, through which the rods G pass, substantially as and for the purposes herein set forth.

3. The combination, with the links E, rods G, and wheels B, of the adjustable plates L, arranged to operate substantially as and for the purposes herein set forth.

4. The combination, with the frame-post having a series of perforations, s, of the angular plate u, having bent arm x pivoted thereto, and said plate adjusted up or down within the post for holding the brake-lever to suit the different positions of the main belt, as set forth.

5. The indicator consisting of the pointer b, graduated plate c, and the protector or shield d, all constructed and arranged to operate substantially as and for the purposes herein set forth.

6. The combination, in a horse-power, of the counterbored wheels B, the rods G, turned to correspond with said counter-bores, and the L-shaped track A A', substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 9th day of August, 1875.

WILLIAM H. BUTTERWORTH. [L.S.]

Witnesses:

LEE C. MOORE,  
JOHN THINES.