S. Perry,

Horse Power.

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Witnesses.
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. **39,324**, dated July 21, 1863.

To all whom it may concern:

Be it known that I, STUART PERRY, of Newport, in the county of Herkimer and State of New York, have invented certain new and useful Improvements 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, making a part of this specification, in which—

Figure 1 represents a top plan of the horse-power, Fig. 2 represents a longitudinal vertical section through the same, and Fig. 3 represents, on an enlarged scale, a case-hardened chain which I use on the horse-power.

My invention relates to that class of horse-powers in which the power of the team is communicated through an endless chain that moves around with the sweeps or frame of the horse-power to a shaft and drive-wheel, from whence it may be transmitted to any mechanism to be driven by or from it. And, as incidental to this class of horse-powers, another part of my invention relates to the case-hardening or cementing of the chain through which the power is transmitted, to prevent it from cutting or wearing away on the sprocket-wheel and the toothed or ribbed pulley against, over, or around which it passes.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A B represent the bed-pieces upon which the horse-power is placed. These pieces may be of plank for convenience of transportation, or any other suitably strong material.

C is a stationary shaft, on or against which the two hubs *a b* turn. These hubs are furnished with flanged disks *c d*, on which flanges the arms D E rest by means of notches, as distinctly seen in Fig. 2. The arms in pairs incline toward each other at their outer ends, and a forked socket, *f*, is driven over them, which, together with their central and notched supports at the hubs *a b*, make them rigid, while at the same time the whole machine can be readily taken down for transportation or storage and as readily set up again without pins, screw-bolts, or such like fastenings, which are liable to be lost or mislaid. The chain F is an endless one and passes around in the forks *f* at the ends of the arms D E until it leaves the fork *f'*. From this fork it passes to and partially around a pulley or friction wheel, G, which is in or on a hinged arm, *g*, and controlled by a spring, *h*, bearing against said arm, so as to take up any slack that there may be in the chain. From this pulley the chain passes between guiding-pulleys *i i*, which are so set as to give the chain more "bight" upon the power-transmitting toothed or ribbed pulley H. Other small guiding-pulleys, 2 2, may also be used to keep the chain truly upon the pulley H. After the chain passes from the pulley H it is caught by the fork at *f''*, and thence around the series of forks which form a sprocket-wheel with which the chain moves and acts.

I is the sweep by which the chain and its supporting wheel or arms are moved around by the team, and a leading-stick, *j*, may be attached to the arm next in advance of the sweep I to lead around the team by.

I have found that the greatest wear in such a horse-power is, first, in the chain, and, secondly, in the power transmitting pulley over or against which the chain works. To prevent the wearing away of the chain I case-harden, or put through the process of cementation, which makes it much more durable.

The process of case-hardening or cementing by animal or vegetable charcoal, and many other ingredients by which the iron is carbonized, or a hard skin put upon it, is well known, and I lay no claim to the process, but believe I am the first to put a hard skin on a chain of any kind, and certainly for a horse-power chain. The pulley over or against which the chain works has steel or chilled teeth or ribs to resist the cutting and wearing of the chain upon it. Power having been thus transmitted to the pulley H, which is upon the shaft J, it is also communicated to the gear K on said shaft, and from said gear to the bevel-pinion L on the end of the shaft M, the opposite end of said shaft being furnished with a band or crank wheel, N, from which the power may be taken and applied to any machinery to be driven by it. I have shown a sawing apparatus as connected therewith, but this constitutes no part of this invention. The hubs *a b* are properly braced by the uprights *k*, extending from one to the other. The ends of the

arms D E are tied by rods *m* to each other, and one of the rods may have a screw-buckle, *i*, upon it to tighten up the whole, or to slacken up with when the machine is to be taken down.

o is a washer placed over the lower hub, *b*, and *p* a pin to hold it down to its place on the shaft C. The upper hub, *a*, may be suspended from the top of the shaft, as shown. The sweep may be hooked to the hub *a* at *s*, and to one of the arms, as at *t*, and have a drag-rod, *u*, extending from it to the next arm in rear of *t*, all these fastenings being detachable. The shaft J has its upper support in a top plate, *q*, and a step at its lower end in the bearing *r*, which also affords a journal-support of the shaft M. The pulleys *i i*, in addition to their guiding the chain and increasing its bight on the main pulley H, also prevent any twist or kink in the chain as it is about to come in contact with said chain-pulley.

At Fig. 4 I have shown a modification of a chain-pulley, H, and on an enlarged scale, in which I have arranged a series of wheels, *v v*, &c., of chilled or hard metal, against which the endless chain F bears, instead of against the pulley itself, and the action of the chain upon these small wheels is such that the wheels are being constantly moved on their axes or journals, and are thus always presenting a new surface-bearing for the chain, which saves the chain-pulley from much of its wear and cutting.

Having thus fully described the construction and operation of my horse-power, what I claim is—

1. The power-transmitting wheel H, having a changing or moving surface for the chain to work upon, substantially as and for the purpose described.

2. Making the forks *f* of a socket form for fitting onto and holding the spokes of the sprocket-wheel, substantially as described.

3. The chain or sprocket wheel composed of the central flanged hubs, the notched spokes, and the sockets, for the purpose of readily taking down the horse power for transportation or for stowage and quickly setting it up again, substantially as described.

4. In combination with the sprocket-wheel and the chain-pulley, a case-hardened or cemented chain for the purpose of preventing undue cutting or wearing of chain, sprocket-wheel, and pulley, substantially as described.

5. The arrangement of the spring-pulley G and hinged arm *g*, for taking up the slack of the chain, substantially as described.

6. The pulleys *i i*, for preventing the twisting of the chain, substantially as described.

7. In combination with the main chain-pulley H, the guiding, directing, and holding pulleys 2 2, substantially as and for the purpose described.

STUART PERRY.

Witnesses:

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