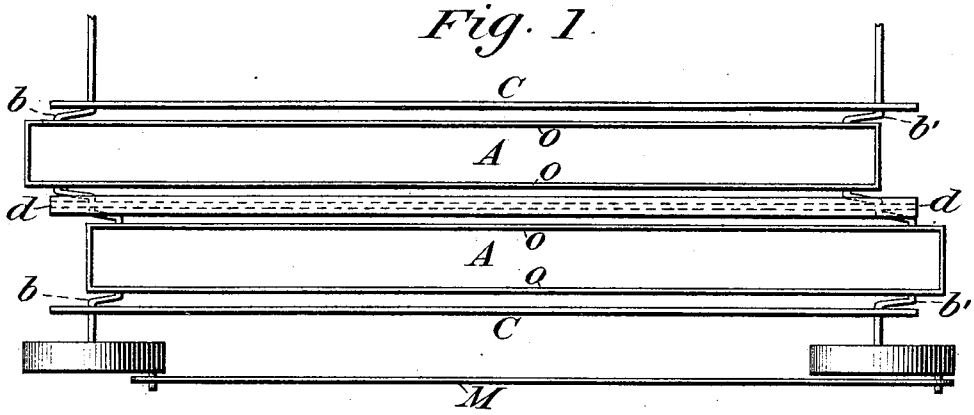
(No Model.) 2 Sheets—Sheet 1.

A. R. BUSHNELL.

TREADLE.

No. 262,368. Patented Aug. 8, 1882.

Fig. 1.



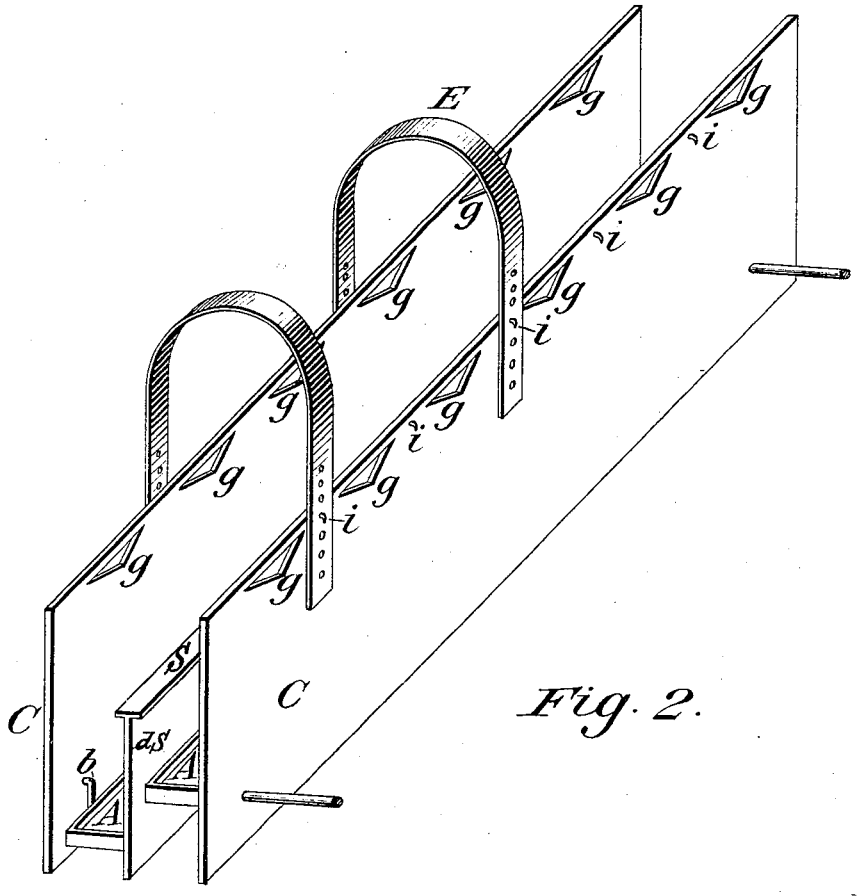


Fig. 2.

Witnesses:
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G. W. Edwards.

Inventor:
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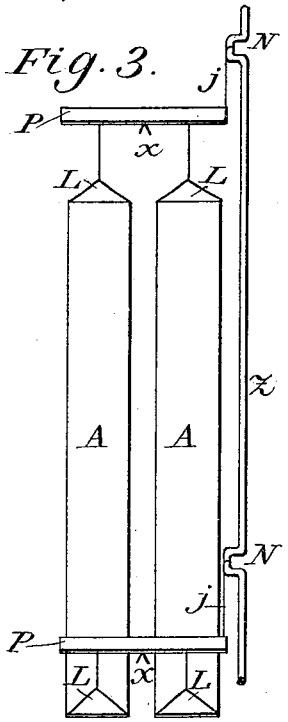
(No Model.)

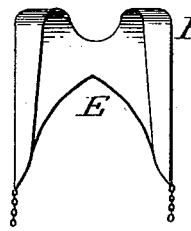
A. R. BUSHNELL.

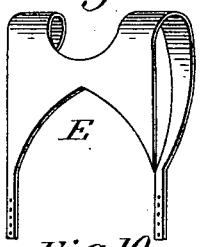
2 Sheets—Sheet 2.

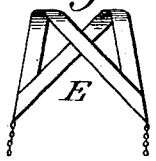
TREADLE.

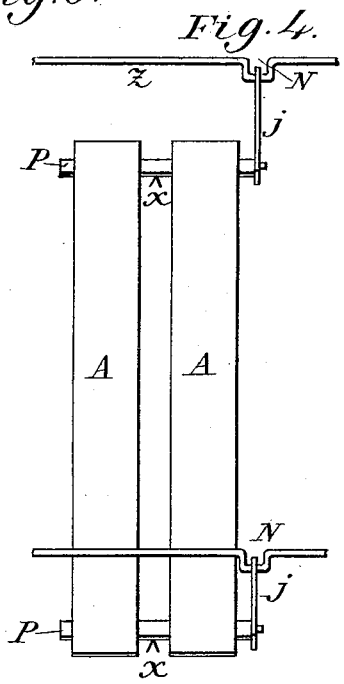
No. 262,368. Patented Aug. 8, 1882.

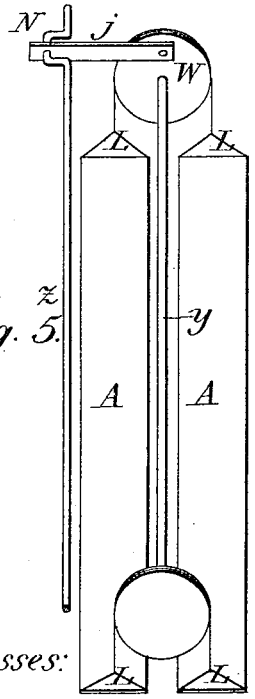


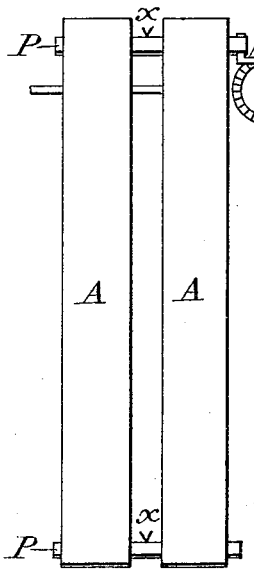


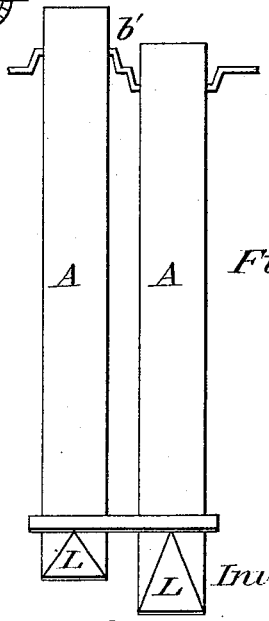












Witnesses:

Myron Sherman,

James A. Walsh,

Inventor:

Allen R. Bushnell.

UNITED STATES PATENT OFFICE.

ALLEN R. BUSHNELL, OF LANCASTER, WISCONSIN.

TREADLE.

SPECIFICATION forming part of Letters Patent No. 262,368, dated August 8, 1882.

Application filed April 12, 1880. (No model.)

To all whom it may concern:

Be it known that I, ALLEN R. BUSHNELL, of the city of Lancaster, in Grant county, Wisconsin, have invented a new and useful improvement of treadles used for imparting motive power, or a new "man-power," as described and set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to greatly increase and extend the power which man may exert by the use of treadles, whereby they may be made more practically useful for the propulsion of all sorts of machinery, railroad and other vehicles, boats, and vessels, to be propelled by man-power.

My invention consists of double treadles working upon one or more double cranks, to be operated by one or more persons up to as many as can stand upon them at a lock-step, standing upon them alternately with the feet; shoulder-braces, side and center guards, seats, hand-holds, and other devices, to enable an increase of motive power beyond the weight of the operators, and for safety, convenience, and facility in operating them.

Figure 1 is a top view of a portion of my invention. A A are the treadles; *b b b' b'*, the double cranks upon which they work; C C, side guards; *d d*, a center guard; O O O O, raised edges or an upward flange around the outer edge of each treadle, and M a connecting-rod.

Fig. 2 is an upright view of the whole machine or power less the connecting-rod M. A A are the treadles; *b*, one of the double cranks; C C, the side guards; *d*, the center guard, with the top broadened to form a seat for the operators. E E are straps or braces, and *i i*, &c., hooks to which these are attached when in use. *g g*, &c., are hand-holds.

Like letters refer to like parts in both views.

The side and center guards, properly secured, by themselves or in connection with the frame-work of that to which it is desired to impart motive power, form the frame-work of the power. The several parts may be made of any suitable material. The treadles are placed parallel with each other at a suitable distance apart, with a double crank of equal length at each end, to the opposite arms of which they are rigidly boxed. The center guard is placed between the treadles and the side guards, one at the outer side of each, and all as near thereto as they can be without friction. These guards extend throughout the whole reach of the treadles in motion. Their office is to prevent injury to the operators through their feet and legs getting off or between the treadles while in motion. The side guards further extend up high enough for the convenient attachment of the hooks *i i*, &c., the formation or attachment of the hand-holds *g g*, &c., and to steady the operators. The center guard further extends up high enough for its top to be widened into or have attached a convenient seat or seats or rests, S, Fig. 2, for the operators when full power is not needed.

To operate this power, one or more operators stand astride of the center guard, *d*, Fig. 2, their feet resting upon the treadles A A, by standing upon which alternately the double cranks *b b b' b'* are revolved.

The shoulder straps or braces E E may be detached when not in use. There should be one for each operator. When an operator desires to increase his motive power beyond his own weight he places one of these over his shoulders and hooks an end on each side at a proper length to one of the hooks *i*, when by lifting against it the force thus exerted will react upon the treadles and increase the motive power. An operator standing, as he does, nearly erect, and lifting with the strongest muscles of his body in the most advantageous position, may thus impart a motive power of several times his own weight.

The hand-holds *g g*, &c., are convenient handles cut in the top of, or they may be attached to, the side guards. They are for the operators to take hold of with their hands to enable them to push forward or backward horizontally upon the treadles with their feet, thus enabling a start from a dead center. By pulling up on them with their hands they may also add to their weight upon the treadles without using the shoulder-braces.

The raised edges or upward flange around the outer edge of each treadle is to keep the feet of the operators from projecting over and rubbing against the guards. They may be extended up so high as to obviate the necessity

of any guards at all for the protection of the operator's feet and legs.

The connecting-rod M is placed outside one of the side guards and each end rigidly boxed to a crank or its equivalent, one upon the outer end of each of the double-crank shafts. These outer cranks must be long enough to make this rod keep the treadles in properly-operating position without too great strain on their boxings. This is its office. For most uses it will not be found necessary. It is obvious that these treadles may be made to act, as shown in Figs. 3 and 4, upon the opposite ends of seesaw-levers P, balanced across the fulcrums *x*, connected by one end by pitmen *j* to single cranks N upon a shaft or shafts, *z;* also, that they may be used, as shown in Fig. 5, by being suspended by cords L over wheels or pulley W upon the shaft *y*, connected by the pitmen *j* with the crank N upon the shaft *z;* also, that they may be used, as shown in Fig. 6, upon like seesaw-levers, upon the end of one of which is fixed the dog D, operating upon the notches of the ratchet-wheel R upon the shaft *z*. They may also be used by thus rigidly boxing one end of each to the opposite arms of one double crank, as at *b'*, Fig. 7, the opposite end of each being supported by a sufficiently-oscillating support to permit the free revolution of the double crank, as the cords L L.

It is also obvious that a harness for the shoulders and back, neck, or shoulder yokes, as shown in Figs. 8, 9, and 10, may be used in place of the shoulder-straps E E.

I am aware that double treadles connected with and made to act upon one double crank by means of a pitman and lever, two pitmen, rods or cords, and equivalent intervening connections have heretofore been used; also, that the handles of the double cranks of most bicycles and velocipedes are enlarged by the attachment to them of foot-rests. These inventions I do not claim. As concerns the use of one double crank, my invention differs from these in these respects, viz: My treadles are rigidly boxed to and work directly upon the double crank without the intervention of lever, pitman, or other connection, and they are not mere enlargements of the crank-handles. The advantage of this rigid attachment is that it enables an operator to change the direction of the power applied to the crank from a perpendicular when desirable. Dead-centers are thus obviated, and the leverage of the whole length of each arm of the crank may be obtained during most of each downward stroke.

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

1. Double longitudinal parallel treadles, each attached to and operating upon the moving mechanism for imparting motive power with them at more than one point, so as to be wholly supported thereby, and so constructed as to be conveniently operated by one or more persons standing upon them alternately with their whole weight, substantially as described.

2. The combination, with double treadles, of shoulder straps, lifts, or braces for the operators to lift or brace against with their shoulders to increase their motive power beyond their own weight, substantially as described.

3. The combination, with double treadles, of side guards provided with hand-holds and shoulder-brace hooks and of a center guard provided with a seat or seats, substantially as and for the purposes described.

4. These double treadles provided with raised edges or flanges, substantially as described.

5. The combination, with these double treadles with double cranks, of the connecting-rod M, substantially as and for the purposes described.

6. The double treadles A A, each rigidly boxed by one end to and working directly upon the opposite arms of one double crank without the intervention of lever, pitman, or other connection, substantially as described.

ALLEN R. BUSHNELL.

Witnesses:
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JOHN J. OSWALD.