

GEORGE BRODIE.

Horse Power.

No. 123,229.

Patented Jan. 30, 1872.

Fig. 1.

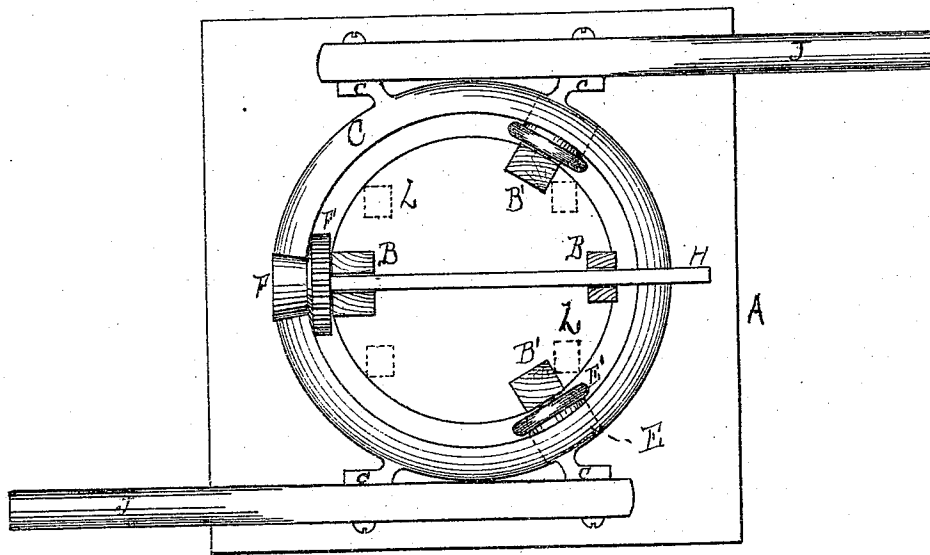
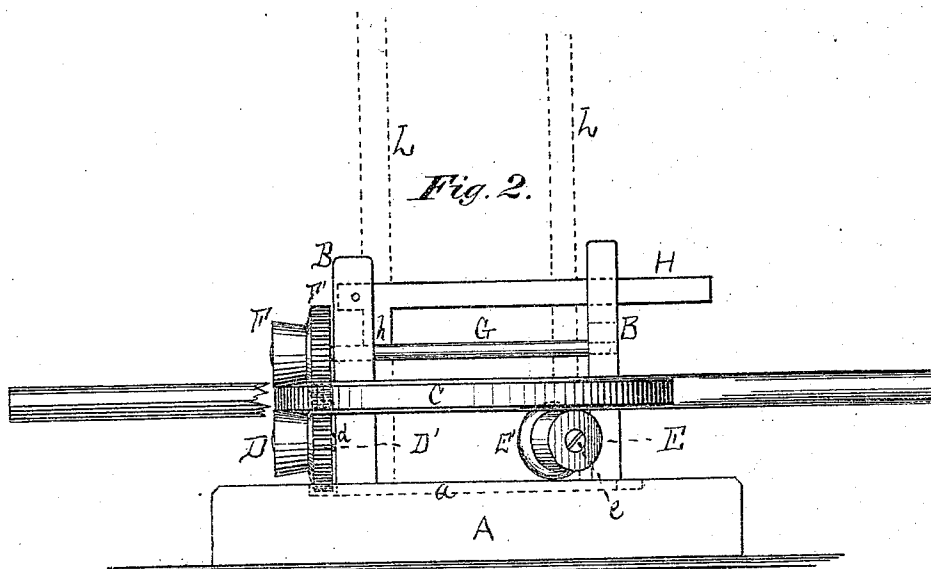


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE BRODIE, OF JEFFERSON, ARKANSAS.

IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. 123,229, dated January 30, 1872; antedated January 19, 1872.

To all whom it may concern:

Be it known that I, GEORGE BRODIE, of the county of Jefferson and State of Arkansas, have invented certain new and useful Improvements in Horse-Powers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a top-plan view. Fig. 2 is a vertical sectional view.

The drawing is made on a scale of three-fourths to the inch.

My present invention relates to an improvement in horse-powers, and while it is adapted for all purposes in which devices of this character are employed, it is pre-eminently fitted and chiefly designed to be used as a motor for driving a cotton-gin and press. On plantations the labor of cleaning the cotton is performed in a gin-house, which invariably occupies the second or upper story of a building especially constructed or erected for the purpose, while the horse-power occupies the lower story or basement. With the horse-powers now used, the difficulty and expenses of constructing a suitable and proper gin-house is very great, which is due to the fact that such immense girders and timbers are required in order to secure the necessary strength to support its floor. These timbers have to be from thirty-five to forty feet in length, and are, owing to the character of the horse-power, denied all central vertical support. A span of this length is required, as practical experience has fully shown that a horse or mule, to work effectively, cannot travel in a circle having a diameter less than thirty-two feet. With the ordinary horse-power it is absolutely demanded that this entire area should be unobstructed, as a moment's reflection will readily show. The nave or hub of the driving-wheel is always so united with its rim or felly by radial arms or spokes, which prevents within the circumference of the wheel the insertion of any stud or equivalent device to support or strengthen the timbers of the gin-house; while the free sweep required for the draft-levers will not allow of the insertion of any such device outside of the wheel, and within the course in which works the horse or mule. The result is, these

girders being held entirely by supports at the side of the building, are required to be of immense size, often two feet thick. Timbers of this character, forty feet long and two feet through, are very difficult to procure and consequently very expensive. With my improvement all these difficulties are remedied, and this it is which constitutes the essence of my invention, and furnishes its chief advantage. Instead of constructing the driving-wheel with a hub and spokes so as to rest and work in a center step, I construct it in the form of a ring-plate or quoit, and support it on friction-rollers. This leaves the interior of the wheel so open or unobstructed as to permit of the introduction of center studs to support the girders, or if desired, the uprights of a press-frame. Another great advantage of my improvement is found in the so combining the friction-rollers and cog or gear-wheels, that the entire strain and pressure of the draft shall rest on the former, the latter only supporting such strain as is absolutely required to revolve the driving-shaft. The great value of this arrangement is found in the fact that, while through a pivoted lever the necessary bite of the friction-rollers on the driving-wheel is insured, the cogs only so engage as to insure the revolution of the one through the movement of the other, and which frees them from all danger and liability of being broken by any sudden start or jerk of the animal.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

A is the bed-piece, which is constructed of any suitable material, and provided with an annular groove, *a*. On the bed-piece A are secured two uprights, B B, and two or more short studs or stumps B' B'. These furnish the necessary supports for the entire operating mechanism. C is the driving-wheel, and consists simply of an open ring-plate or rim of the ordinary quoit-form. This wheel or rim C is cast either solid or hollow, in one piece, or in segments or sections, and without hub, spokes, or any other equivalent device. This wheel C is supported and travels on friction rollers D and E E; the former having aatchet-flange, D', and the latter the ordinary car-wheel flange E' E'. The roller D is pivoted

by an axial bolt, *d*, to one of the uprights *B*, while the rollers *E E* are secured by like axial bolts *e e* to the posts or stumps *B' B'*. It will be observed, by reference to Fig. 1, that these friction-rollers are so distributed on the bed-piece *A*, as to furnish a uniform and even support to the wheel *C*, and which always insures of its revolving in a true horizontal plane. The width of the tread of these rollers should be equal to that of the wheel or rim *C*, so as to secure the greatest possible bearing of the one on the other. The friction-bite of the rollers on the driving-wheel is regulated by a friction-roller, *F*, attached to the driving-shaft *G*, and a pivoted hand-lever, *H*. The driving-shaft works in a fixed journal in one of the uprights *B*, its other bearing being in the slotted head of the opposite upright. This driving-shaft should be of such length as to allow of its projecting through the slot a sufficient distance to afford an axial bearing for the friction-roller *F*. This roller *F* is provided with a ratchet-flange, *F'*, and is in every respect the exact counterpart of the roller and flange *D D'*. The bearing of these rollers being on a line, of course, one works immediately above the other, their ratchet-flanges meeting and meshing together. The driving-shaft *G* is connected with the gin-house by suitable belting. *J J* are the levers, to which the horse or mule is attached, and are secured to the outer periphery of the wheel *C* by means of ears *c c*, or other equivalent device. It will be observed, that owing to the form of the wheel *C*, how easy it is to introduce within the circle of its periphery uprights or posts *L L*, which may serve to support the upper story of the building, or if desired, the vertical studs or supports of a press may be introduced.

From the foregoing description the operation will readily be understood. The friction-rollers *D* and *E E* are pivoted to their supports by axial bolts, as stated. The wheel *C* is then passed over the uprights *B B* and falls on the friction-rollers. These rollers being of uniform diameter, and their axial bearings be-

ing on a true horizontal line with each other, a uniform and even traveling support is furnished to the wheel. The driving-shaft *G* is then secured, as stated, one end working in a fixed journal in one of the uprights *B*, while its other end rests and works in the slotted head of the other upright. This end of the shaft projects through the slot, and carries the friction-roller *F*, with its ratchet-flange *F'*.

The friction-face of the roller *F* rests on the upper face of the wheel *C*, immediately above the roller *D*. The ratchet-flanges *F'* and *D'* meshing, furnish the cog-gearing necessary to revolve the driving-shaft *G*. It will be seen, by reference to Fig. 2, that the head *h* of the hand-lever *H*, rests directly upon the shaft *G*. So, by depressing this lever, the friction-bite of the roller *F* is regulated, and the degree of contact between the teeth of the wheels *D' F'* controlled. It will be seen by this arrangement how entirely the cog-wheels are freed from all undue strain, and guarded against all danger of being injured by any sudden start of the animal, as all strain of this character falls necessarily on the friction-rollers.

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

1. The wheel *C*, provided with lever attachments, friction-rollers *D E E F*, ratchet-wheels *B' F'*, and axial-shaft *G*, when the same are so combined and arranged as to operate substantially as described.

2. The hand-lever *H*, when the same is so arranged as to operate in the manner described, as and for the purpose specified.

In testimony whereof I have signed my to this specification in the presence of two subscribing witnesses.

GEORGE BRODIE.

Witnesses:

WM. MARTIN,
EDWIN JAMES.