2 Sheets--Sheet 1.

J. M. POWELL.

Horse-Powers.

No. 150,889. Patented May 12, 1874.

FIG 1.

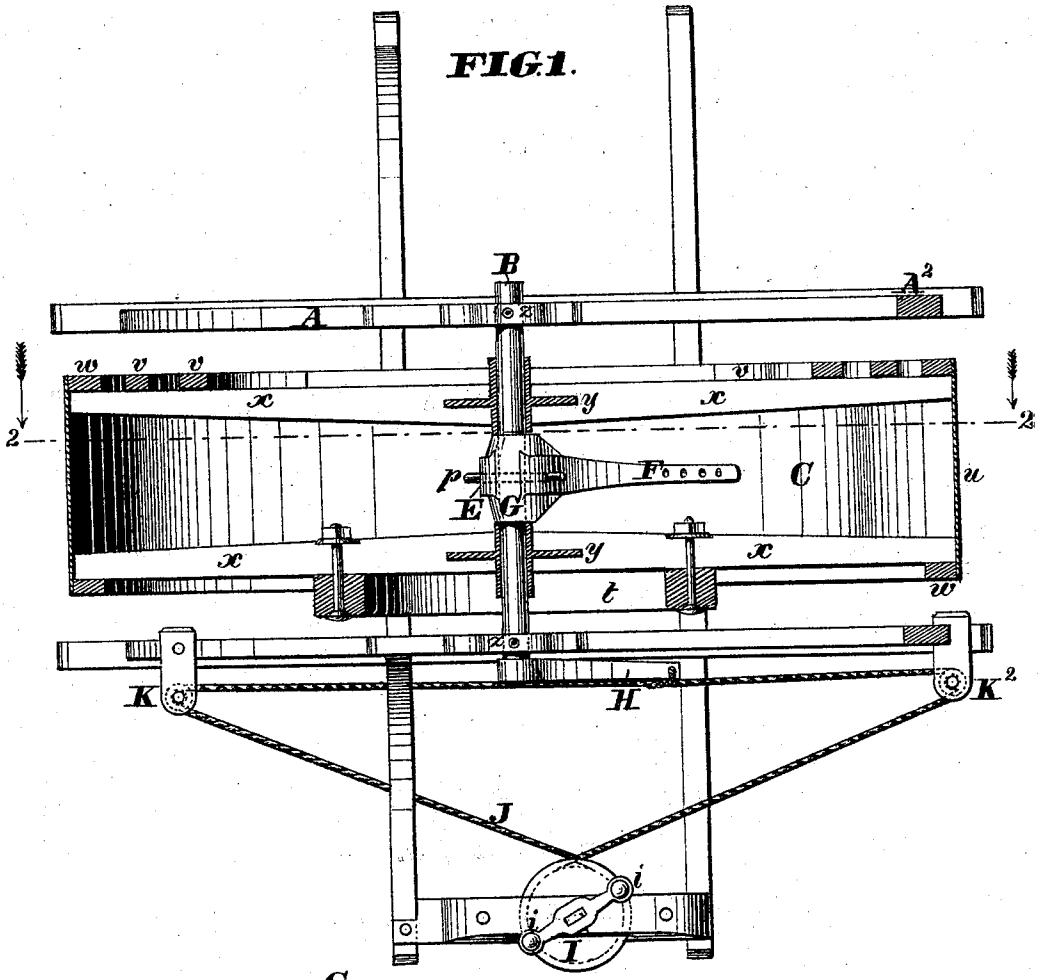
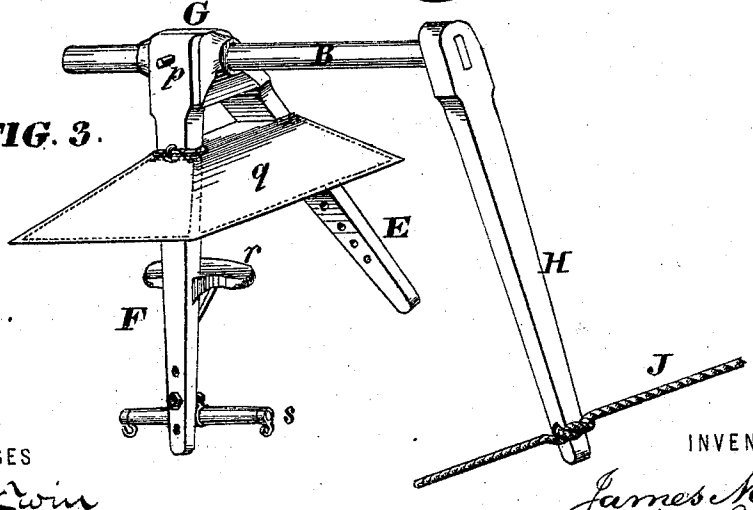


FIG. 3.



WITNESSES

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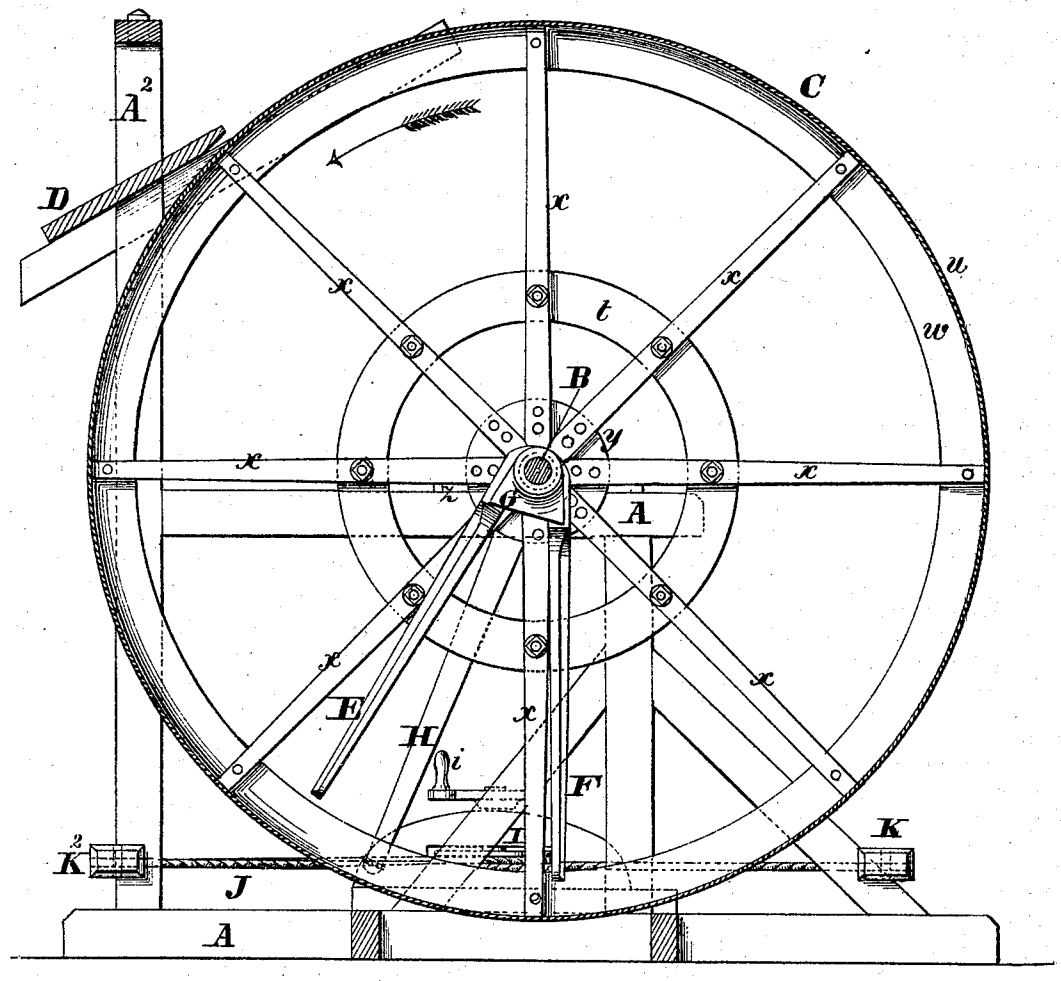
2 Sheets--Sheet 2.

J. M. POWELL.

Horse-Powers.

No. 150,889. Patented May 12, 1874.

FIG. 2.



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UNITED STATES PATENT OFFICE.

JAMES M. POWELL, OF ALVARADO, TEXAS.

IMPROVEMENT IN HORSE-POWERS.

Specification forming part of Letters Patent No. **150,889**, dated May 12, 1874; application filed April 2, 1874.

To all whom it may concern:

Be it known that I, JAMES M. POWELL, of the town of Alvarado and county of Johnson, in the State of Texas, have invented a certain Improvement in Animal-Power Apparatus, of which the following is a specification:

This invention relates to means for driving cotton-gins and other light machinery by animal power; and it relates to that form of animal-power apparatus termed the vertical tread-wheel. The present invention consists in a vertical tread-wheel, mounted loosely on a horizontal shaft, in combination with levers or arms projecting from the shaft within the wheel, to be provided with a leading-pole and draft-bar, with or without means for applying a second team externally at the top of the wheel. The invention consists further in the provision of a regulating-lever, for adjusting the shaft with its arms so as to shift the team within the wheel, and thus readily increase or diminish the power, as required.

Figure 1 is a plan view of this improved apparatus, partly in horizontal section, in the plane of its shaft. Fig. 2 is a vertical section of the same on the line 2 2, Fig. 1, looking in the direction of the arrows. Fig. 3 is a perspective view of the shaft and its attachments, illustrating certain details.

A strongly-braced frame, A, to support the working-parts of this apparatus, may be constructed of any suitable shape and material. This is provided with bearings *z z*, for an elevated horizontal shaft, B, on which a large vertical tread-wheel, C, is loosely mounted. This determines the size and maximum power of the apparatus, and is designed to measure, say ten feet across its periphery, and twenty-four feet in diameter. A wheel of these dimensions will yield ten-horse power from four oxen working abreast within it, or twenty-horse power by the addition of four more oxen, to be applied externally at the top of the wheel. The wheel may be made wider or narrower to accommodate a larger or smaller team, or it may be made of greater or less diameter, as preferred. The wheel is composed of a pair of heavy cast-iron hubs, *y y*, radial arms or spokes *x* in sufficient number securely attached to the hubs, annular rim-strips *w*, and any number of concentric segmental braces *v*, or straight braces, spiked or bolted to the arms, with the cylindrical rim or periphery *u* of transverse planks, spiked or bolted to the rim-strips *w*, and roughened by ribs if preferred. In the illustration the hubs are formed with deep perforated circumferential flanges, which are embraced by the slotted inner ends of the arms, and united therewith by through-bolts. In lieu of this construction, the hubs may have sockets for the same, if preferred. A ring, *t*, bolted to one face of the wheel, may constitute a pulley, or serve for the attachment of a spur-rim for transmitting motion, or the power may be taken in any common or preferred way.

For applying a team externally to the top of the wheel, the frame A may be extended vertically, as shown at A^2 in Fig. 2, and support the upper end of an inclined way, D, leading from the ground, the edge to be properly banistered, and the requisite appliances added for hitching and controlling the team. These may be similar to those used in the common endless-chain horse-power.

For applying and controlling the team within the wheel, a pair of levers or arms, E F, are rigidly and strongly attached to the stationary shaft B, so as to project before and behind the animals. The front arm E serves for attaching a leading-pole, (not shown.) The rear arm F serves for attaching a draft-bar, *g*, Fig. 3, to which the animals may be hitched, so as to utilize their pulling-capacity as well as their weight. A seat, *r*, for a boy to drive the team, may be applied to this arm, and a canvas screen, *q*, may be stretched between the arms, or attached thereto, to protect the boy and team from falling trash or dirt, as illustrated in Fig. 3. The arms may be perforated as represented to render the leading-pole and draft-bar adjustable as to height, and they may also be braced beneath the shaft. The arms E F may be attached to the shaft B, as in the illustration, by a segmental hub, G, with dovetailed grooves to receive the upper ends of the arms, in combination with a transverse pin or key, *p*, to lock the whole. To provide for regulating the power, the shaft B being non-rotary and mounted in bearings, as already described, a lever, H, is attached thereto, outside of the wheel. By moving this the

shaft is turned slightly, and its arms E F within the wheel are adjusted, and the team thus shifted to a position where the periphery of the wheel represents a more abrupt or less abrupt incline, and where the weight of the team will consequently have a greater or less effect, as the case may be. This regulating-lever may be actuated by the hand applied directly, and a notched bar, or its equivalent, be provided for holding it; or any approved mechanical device may be employed for working the lever with increased force. A preferred device of this character, as applied to the apparatus, is illustrated in the drawing. It consists of a short windlass, I, having a pair of hand-cranks, *i*, in combination with a continuous rope, J, attached centrally to the extremity of the lever, and a pair of pulleys or sheaves, K K^2, around or through which the rope is carried. Motion is imparted to the windlass by one or both hands, and, as one end of the rope is wound thereon, and the other is unwound, the lever is forcibly drawn in the desired direction, and any sudden movement thereof by the team is prevented.

Having thus described this my invention, I claim—

1. A vertical tread-wheel, C, mounted loosely on a horizontal shaft, B, in combination with arms E F, projecting radially from the shaft within the wheel, for the attachment of a leading-pole and draft-bar, as herein described.

2. The combination of the vertical tread-wheel C, the shaft B, having radial arms E F within the wheel, and the inclined way D and frame-extension A^2, substantially as and for the purpose set forth.

3. The regulating-lever H, in combination with the stationary shaft B mounted in bearings *z z*, and having the arms E F attached to said shaft, substantially as and for the purposes set forth.

JAMES M. POWELL.

Witnesses:

B. F. POWELL,

J. W. TURPEN.