(No Model.)

D. S. WAUGH.

HORSE POWER FOR HAY PRESSES.

No. 421,035. Patented Feb. 11, 1890.

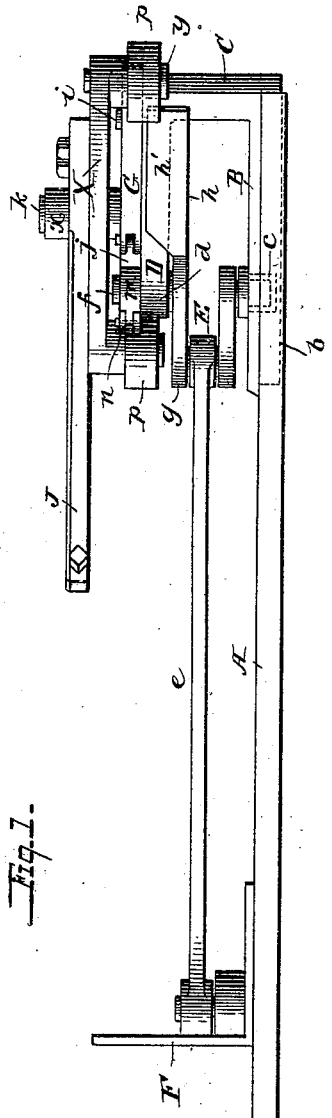

Fig. 1.

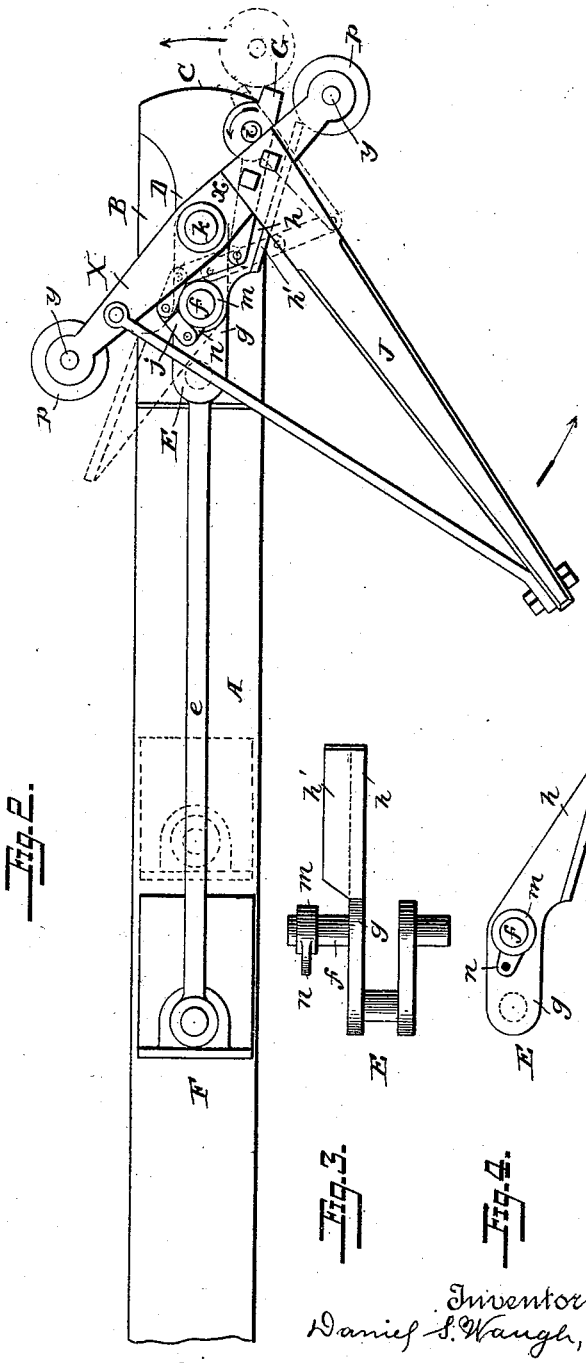

Fig. 2.

Fig. 3.

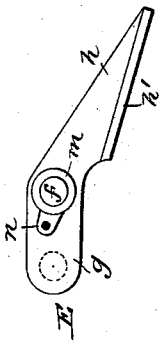

Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

DANIEL S. WAUGH, OF DENVER, COLORADO.

HORSE-POWER FOR HAY-PRESSES.

SPECIFICATION forming part of Letters Patent No. 421,035, dated February 11, 1890.

Application filed June 14, 1889. Serial No. 314,266. (No model.)

To all whom it may concern:

Be it known that I, DANIEL S. WAUGH, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Horse-Power for Hay-Presses, of which the following is a specification.

This invention is an improved horse-power specially designed for use in connection with portable hay-presses of the plunger type, although it may with like facility be employed wherever such a power is applicable and it is desired to impart a positive reciprocating movement to a piston or other similar device; and the invention consists in the construction hereinafter set forth, embodying a light, strong, and inexpensive apparatus wherein the parts are not liable to derangement and may be readily replaced in detail in case of breakage or otherwise.

In the drawings, Figure 1 is a side view of my improved horse-power as applied to a hay-press. Fig. 2 is a plan view. Fig. 3 is a detail side view of the crank-shaft detached, and Fig. 4 is a plan of Fig. 3.

The main frame of the machine consists of a base A, adapted, as usual, to be mounted upon carrying-wheels for purposes of transportation, and at the forward end of the frame is located a frame or casing containing a baling-chamber of any approved form. At the opposite end of the frame and firmly secured thereto is a supporting-plate B, preferably extending entirely across the frame, so as to have a firm bearing thereon, and rising from the outer end of this plate is a standard C, terminating at its upper extremity in a forwardly-extending arm D parallel with the body of the plate, thus forming a substantially U-shaped bearing-frame. These parts are preferably made in one piece, as shown, either by casting or otherwise, and centrally on the reverse side of the plate B is a longitudinal stiffening-rib *b*, which serves as a brace for the plate and the end standard carried thereby.

A crank-shaft E, connected by a pitman *e* to the plunger F of the press, is journaled in suitable bearings *c d*, formed, respectively, in the base-plate and in the horizontal arm D, as shown. The upper horizontal arm *g* of the crank-shaft is prolonged beyond the journal *f* thereof to form a lever or arm *h*, with its side face at a slight angle to the body portion of the shaft, as best illustrated in the plan view, Fig. 4, and on the outer edge of the lever is a comparatively wide bearing-flange *h'*, projecting upwardly.

A lever G, swinging on a stud *i* at the upper end of the standard C near one side of the machine, is suitably connected at its inner end by a flexible connection to the main crank-shaft E. This connection, as shown, consists of a series of connected links *j*, pivoted to the lever and to a lateral ear *n* on a collar *m*, keyed or otherwise secured to the upper end of the journal *f* of the crank-shaft above the horizontal arm D, as clearly shown in Fig. 2.

On the upper side of the arm D, about midway of its length, is arranged an extended vertical stud *k*, upon which is mounted the hub *x* of a sweep-lever X, provided at its outer ends with rollers *p*, turning upon pins *y*, and connected to and carried by the sweep-lever is a sweep J, to the outer end of which the draft-animal is secured in the usual manner.

In the operation of the device, which will be readily understood from the foregoing description, the parts being in the position shown in dotted lines, Fig. 2, the sweep is drawn in the direction indicated by the arrow, and as it continues to revolve one of the rollers *p* comes in contact with the bearing-flange *h'* on the lever *h* and carries the latter around with it to the position shown in full lines, thus forcing the plunger F into the baling-chamber and compressing the hay therein. The parts are so adjusted that when the plunger has completed its inward movement, as just described, the roller *p* passes from contact with the flange *h'* and permits the plunger to remain at rest until the roller on its continued forward movement comes in contact with the outer or free end of the lever G. This lever is then vibrated upon its fulcrum in the direction of its arrow, thereby drawing upon the links *j* and swinging the main crank-shaft back toward its original position preparatory to the commencement of another stroke upon the contact of the succeeding roller *p* at the other end of the

sweep-lever with the lever *h*, the plunger thus making two strokes to each complete revolution of the sweep, as will be apparent. It will be observed that when the plunger is at the limit of its inward stroke the main crank-shaft is on the dead-center, so that the plunger is thereby locked against any outward movement until the crank-shaft is again vibrated by the lever G toward its starting-point, when such outward movement will be completed by the elasticity of the compressed hay within the baling-chamber acting against the plunger. A slight movement only of the lever G is thus required to remove the crank-shaft from the dead-point and to reset it for a second stroke, such return movement of the plunger throwing the said lever to its original position ready to receive the thrust of the following wheel *p* as it rides from the end of the flange *h'*, as before stated.

In powers of this general character at present in use the rebound of the plunger, due to the expansive action of the compressed hay, frequently results in rupturing the operative parts of the apparatus, owing to the great strain imposed thereon as the plunger reaches the limit of its outward movement. I overcome this difficulty in a great measure in my improved power by so disposing the members thereof that upon the outward thrust of the plunger the shaft E is free to vibrate in its bearings disconnected from and without danger of contact with other parts of the device, while at the same time the momentum imparted to the crank-shaft and connected parts by the rebound of the plunger is ordinarily sufficient to carry the crank beyond the outer dead-point and to again start it on an inward movement from the other side, thereby in a measure neutralizing the effect of the outward thrust before the crank finally comes to rest.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, with the plunger, crank-shaft, and connecting-rod, of an arm *h* on the crank-shaft, a pivoted lever G, a flexible connection between said lever and crank-shaft, and a sweep-lever X, pivoted to make contact at each end successively with said arm *h* and lever G, substantially as described.

2. In a horse-power, the combination of the frame, the main crank-shaft mounted therein and provided with an extended bearing lever or arm, as described, a pivoted lever connected at its inner end by links to an ear on the crank-shaft, and a sweep-lever adjusted to successively engage with said arm and pivoted lever, substantially as and for the purpose set forth.

3. In a horse-power for hay-presses, the combination of the frame, the crank-shaft having an extended arm *h*, a plunger and its connection with the shaft, a lever pivoted between its ends and connected to the crank-shaft, as described, a sweep, and a sweep-lever adapted to engage at its ends successively with said arm and pivoted lever, whereby the plunger is first thrust forward and then retracted, substantially as set forth.

4. In a horse-power, the combination of the frame, the main crank-shaft, one arm of which is prolonged to form a bearing-lever, as described, a second lever pivoted between its ends to a stud at the side of the frame, a flexible connection between the inner end of the latter lever and said shaft, and a sweep-lever carrying rollers at its ends and adapted to successively engage with said levers, substantially as and for the purpose described.

5. In a horse-power, the combination of the U-shaped frame, crank-shaft journaled therein, a lever or arm connected to said shaft and having an upturned edge flange and laterally-inclined bearing-face thereon, a second lever pivoted between its ends and connected to an ear on the crank-shaft by links, and a sweep-lever mounted above and carrying depending rollers at its ends adapted to engage successively with said flange and pivoted lever, substantially as and for the purpose set forth.

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

DANIEL S. WAUGH.

Witnesses:
THOMAS WALKER,
C. A. LOVELACE.