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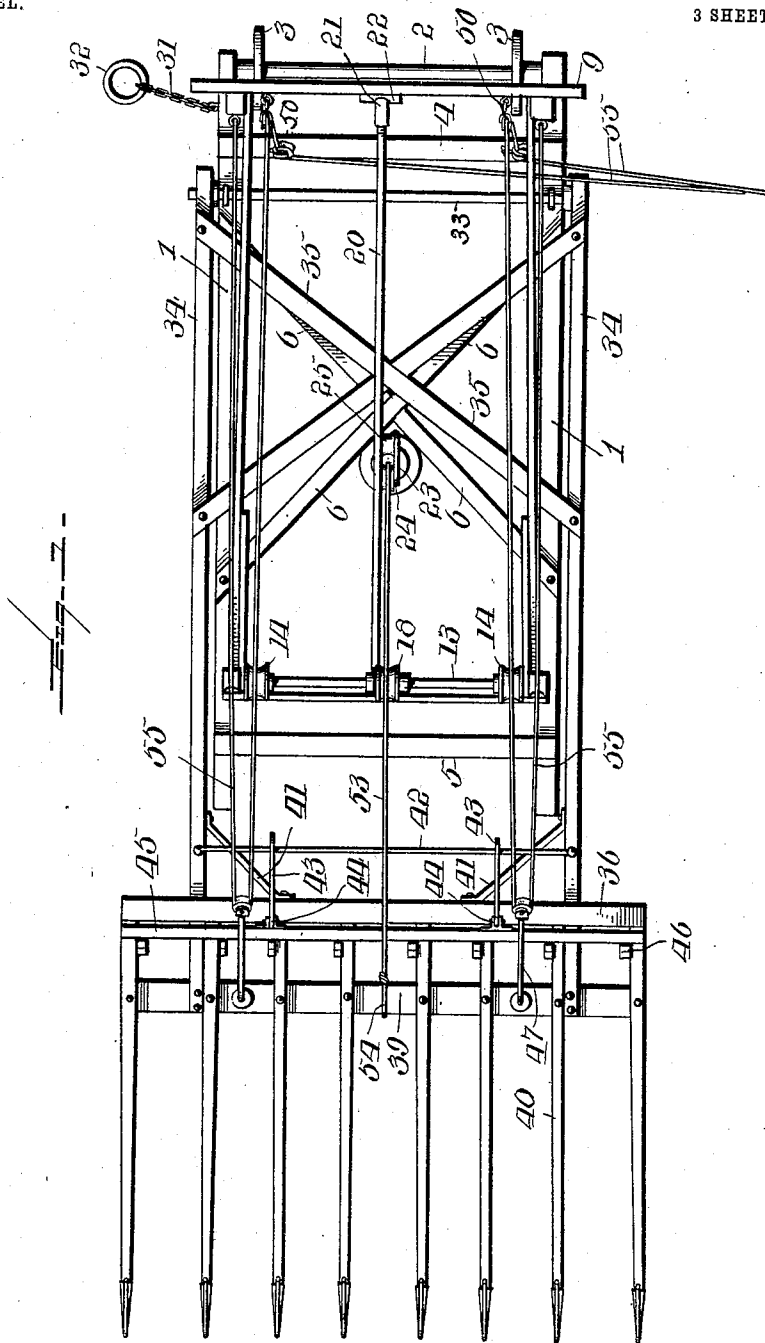
PATENTED JAN. 20, 1903.

J. M. COPENHAVER.
HAY STACKER.

APPLICATION FILED APR. 29, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

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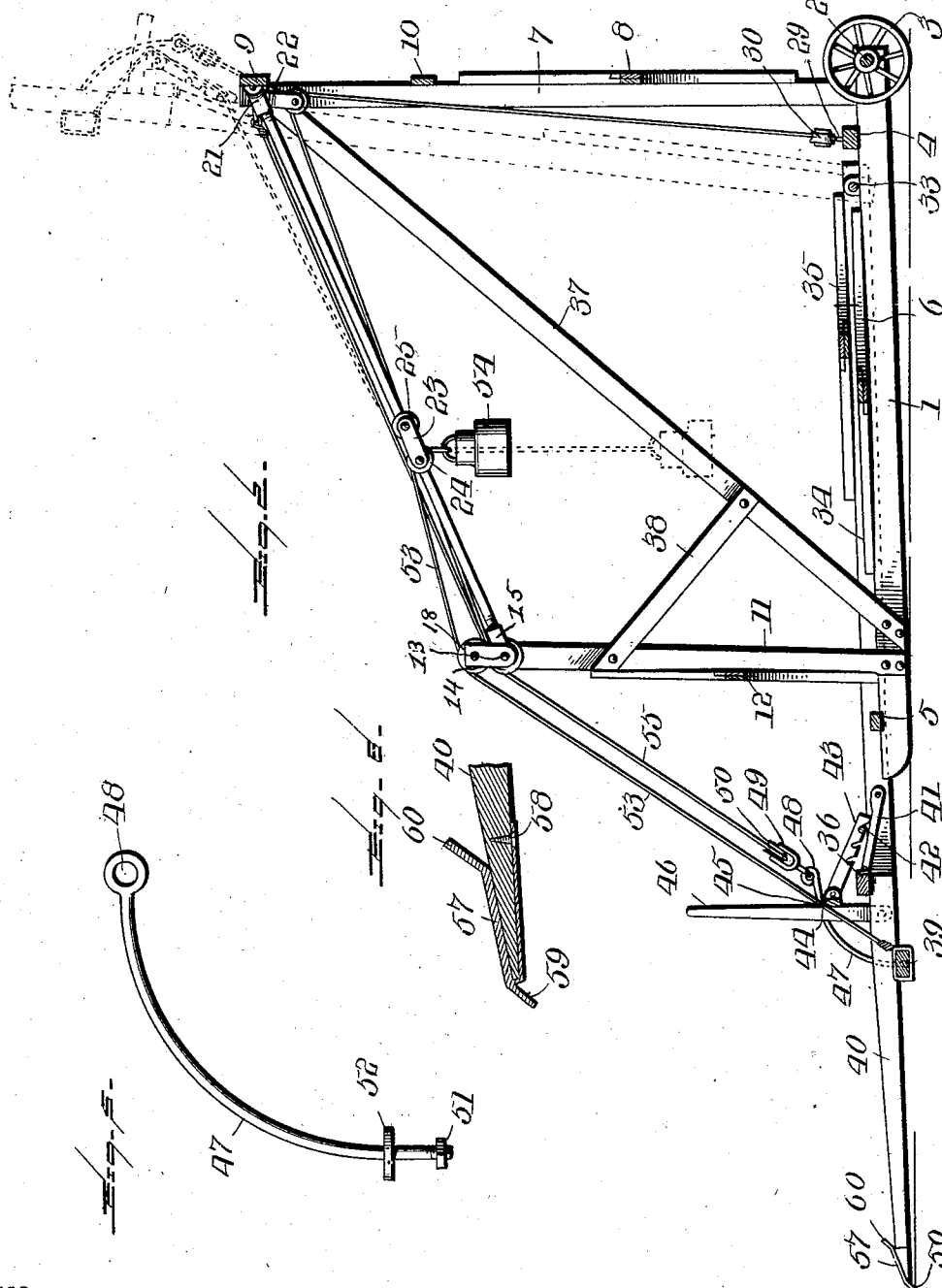
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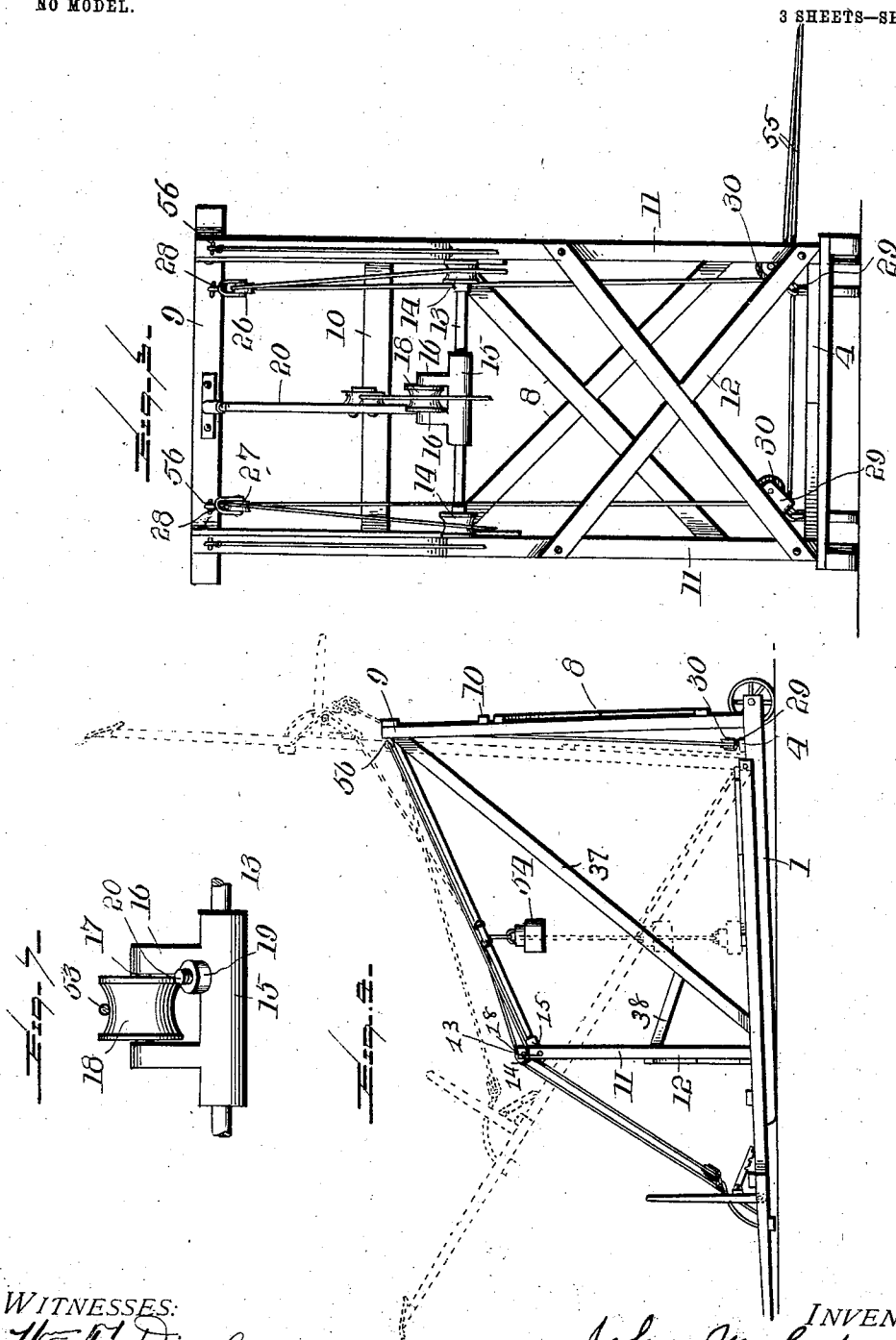
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UNITED STATES PATENT OFFICE.

JOHN M. COPENHAVER, OF LUTON, IOWA.

HAY-STACKER.

SPECIFICATION forming part of Letters Patent No. 718,605, dated January 20, 1903.

Application filed April 29, 1902. Serial No. 105,243. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. COPENHAVER, a citizen of the United States, residing at Luton, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Hay-Stackers, of which the following is a specification.

This invention relates to certain new and useful improvements in hay-stackers; and it has for its object, among others, to provide a simple and cheap stacker by means of which more hay may be stacked in a given length of time at less expense and by the exertion of less power. The elevating-ropes are given a greater angle in order that the load may be lifted more easily. The front and rear posts are braced centrally, so as to render the stacker more rigid. My stacker can be moved about more easily, and but one stake is required to stake it down in position for use. It is very durable, will stand a great amount of rough usage, and will lift the hay higher and top out the stacks better, and the device as a whole will be found most efficient and reliable in use.

Other objects and advantages of this invention will hereinafter appear, and the novel features thereto will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is the top plan of my improved hay-stacker. Fig. 2 is the substantially central longitudinal vertical section through the same. Fig. 3 is a rear elevation with the rake-head removed. Fig. 4 is the side elevation on a smaller scale, showing the parts in different positions by dotted lines. Fig. 5 is the detailed view of one of the pulley-arms. Fig. 6 is an enlarged sectional view through one of the tooth-points. Fig. 7 is an enlarged elevation of the pulley-casting.

Like numerals of reference indicate like parts throughout the several views.

Referring now to the details of the drawings, 1 designates the sills, which may be of any suitable material and dimensions, in the rear portion of which is the axle 2, on which are the wheels 3. The sills 1 are braced at their rear ends by the transverse timber 4

and at their forward ends by a similar timber 5. Between their ends they are braced by the crossed braces 6, as seen best in Fig. 1. Rising from the rear end of the sills are the rear posts 7, the lower ends of which are rigidly secured to the sills in any suitable manner, and these rear posts are braced by the crossed braces 8 and at the upper end by a cross-plate 9 and between the top brace 9 and the crossed braces by a plate 10, all as clearly shown in the drawings.

11 designates the front posts rising from the front end of the sills, to which they are connected in any suitable manner, and these front posts are braced by the crossed braces 12, so as to give great rigidity thereto.

13 is a rod or shaft held in the upper ends of the front post, and on this rod or shaft, near each end, are the grooved pulleys 14, mounted so as to loosely revolve upon the rod or shaft and held against movement longitudinally of the same in any suitable manner. Secured centrally to this shaft or rod is the pulley-casting 15, (seen detached in Fig. 7,) the same comprising the body portion, through which the rod or shaft passes, and the lugs or ears 16, in which is mounted the shaft 17, on which is mounted to loosely revolve the grooved pulley 18, all as seen clearly in Figs. 3 and 7. The body portion of this casting is provided with a screw-threaded piece or socket 19, into which is received one end of the brace-rod 20, the other end of which is engaged in the screw-threaded socket 21 of the casting 22, secured centrally to the forward face of the upper brace-bar 9. On this brace-rod, intermediate its ends, is secured a plate 23, in which are mounted to loosely revolve the grooved pulleys 24 and 25. This plate is secured to the brace-rod by suitable pins or the like which pass through the same into the said rod and serve as pin-tles for the rollers 24 and 25, as will be readily understood upon reference to Figs. 2, 4, and 1. On the forward face of the bar 9 are pivotally supported grooved pulleys 26 and 27, carried by the pivotally-suspended hangers 28, while on the cross-bar 4 are pivotally-connected hangers 29, in which are mounted the grooved pulleys or rollers 30, the use of which will be hereinafter described.

31 is a stake-chain secured to the rear end

of the sill and provided with a ring 32, which is designed to be engaged by the stake (not shown) for staking the stacker in the desired position.

5 Mounted in the sills or in suitable means upon the upper faces thereof just forward of the brace-bar 4 is a shaft or rod 33, on which are pivotally mounted the rear ends of the arms 34 in any suitable manner. These arms
10 are braced near their rear ends by the crossed braces 35 and near their forward ends by the back fork-head 36, all as clearly shown in the drawings.

Braces 37 connect the upper ends of the
15 rear posts with the sills near their forward ends, and the inclined braces 38 connect this brace 37 with the front posts 11, as seen best in Fig. 2. It will thus be seen that I provide a very strong, well-braced, rigid framework
20 and that the short forward posts give such an angle to the hoisting-ropes as to render it an easy matter to elevate the load.

39 is the front bottom fork-head, secured to the under side of the teeth 40, the rear ends
25 of which teeth are connected to the under side of the back fork-head 36, as seen clearly in Fig. 2. These teeth may be as many in number as may be desired and of any suitable length.

41 designates brace-rods for the fork-head. They are disposed angularly, as shown best in Fig. 1, being secured at one end to the rear face of the member 36, and 42 is a transverse rod secured to the arm 34, as seen best in Fig.
35 1, and this rod is designed to be engaged by the notched fork-teeth braces 43, as seen in Figs. 1 and 2, the said notched braces being pivotally mounted, as at 44, on the back-fork-tooth brace, as seen clearly in Figs. 1 and 2.
40 The back fork-teeth 46 are secured at their lower ends to the teeth 40 and also to the back-fork-teeth cross-piece 45 by bolts or otherwise.

47 designates curved pulley-arms secured
45 at their lower ends to the front bottom fork-head 39 and being curved upward and rearward have their rear ends provided with the eyes 48, in which are pivotally engaged the hangers 49, carrying the grooved pulleys or
50 rollers 50. These pulley-arms may be secured in any suitable manner, but in this instance are shown as having their lower ends screw-threaded to receive the nuts 51 and also provided with collars 52 to engage the
55 upper face of the member 39.

53 is the rope, having one end secured, as at 54, to the member 39, and its other end after passing over the pulley 18 and over the pulley 24 has secured thereto the weight 54,
60 which may be of any desired shape, preferably, however, substantially that herein illustrated and ordinarily weighing about two hundred pounds.

55 designates other cords, which have one
65 end secured to some suitable means, as staples or the like, 56, on the front face of the

upper cross-bar 9 of the rear posts and after passing over the pulleys 14 and around pulleys 50 thence back and over the pulleys 26 and 27, thence downward one at each side of
70 the device and under the pulleys 30, and thence off to one side, where they are designed to be connected in any suitable manner with the horse or other power by means of which the load is to be lifted. 75

57 designates the teeth-points. They are secured to the front ends of the fork-teeth 40 by means of a screw passed upward from the under side of the point or casting, as seen clearly in Fig. 6. These points are formed,
80 preferably, of casting, with a prong 59 inclined downwardly and with the hooks 60 sticking upwardly, all as seen clearly in Fig. 6.

The ropes employed are preferably three-quarter-inch ropes, and it has been proven
85 by careful tests that with my stacker one of such ropes will last to stack from fifteen hundred to two thousand tons. The wheels under the rear end of the stacker render it easy to move the same, and the peculiar arrange-
90 ment and disposition of the parts makes the device as a whole a most compact and useful machine for the purpose for which it is designed.

From the foregoing description, when taken
95 in connection with the annexed drawings, the operation of the device will be apparent, and further description thereof does not appear necessary, it being evident that with the parts in the position seen in full lines in Fig. 4 and
100 the load placed upon the teeth, when power is applied to the ropes 55 in the manner specified, the side bars carrying the teeth will be turned on their pivots into the position first seen in Fig. 4 by the lowermost dotted lines,
105 the weight 55 descending as the side bars are raised, and as power is continued the parts are thrown into the position in which they are seen at the right of said Fig. 4. As the parts are returned to their normal position,
110 the weight acts as a counterbalance and serves to return the parts to their former position without any danger of injury thereto.

Modifications in detail may be resorted to without departing from the spirit of the in-
115 vention or sacrificing any of its advantages, and I therefore do not wish to be restricted to the details of construction herein disclosed, but reserve the right to make such changes, variations, and modifications as come prop-
120 erly within the scope of the protection prayed.

What is claimed as new is—

1. In a hay-stacker, sills braced at their forward and rear ends and at their mid-length, rear posts rising therefrom, front posts of less
125 length, pivotally-mounted side bars carrying the fork-teeth, a rod connecting the front posts, a pulley-casting supported on said rod, a pulley mounted on said casting, a connection between said casting and rear posts and cords
130 passed over pulleys on the front posts and extending in an inclined direction over pul-

leys on the fork-head, and thence rearward over side pulleys to the hoisting means substantially as described.

2. In a hay-stacker, sills mounted at their rear ends upon wheels, front and rear posts of different heights, pulleys supported on the front posts, and a pulley-casting supported on a rod connecting the front posts, and a pulley mounted in the casting, and a rod connecting said casting with a cross-bar on the rear posts, substantially as described.

3. In a hay-stacker, the combination with the sills and the side bars pivotally mounted thereon and carrying the fork-teeth, of means for raising said side bars, a cross-rod connecting the front posts, a casting carrying a pulley, and mounted on said rod, and a cord and a counterbalance-weight connected with the fork-head, substantially as described.

4. In a hay-stacker, the combination with the sills and the pivoted side bars carrying the fork-teeth, of means for raising said side bars, and a counterbalance therefor and a pulley-casting and the centrally-disposed inclined brace-rod having one end connected with said casting, substantially as described.

5. In a hay-stacker, pivoted side bars, means for raising said side bars, a counterbalance therefor, a pulley-casting and a centrally-disposed inclined brace-rod having one end connected with said casting, front and rear fork-heads, and fork-teeth connected to opposite faces of said front and rear fork-heads, and a latch and connections for holding the same in adjusted position substantially as described.

6. In a hay-stacker, pivotally-mounted side

bars, means for raising said side bars, a counterbalance therefor, a pulley-casting and a centrally-disposed inclined brace-rod having one end connected with said casting, upper and lower fork-heads, fork-teeth secured thereto, and vertically-disposed fork-teeth secured to the first-mentioned teeth, and a latch and connections for holding the same in adjusted position substantially as described.

7. In a hay-stacker, pivotally-mounted side bars, fork-heads secured thereto, horizontally-disposed fork-teeth secured to the fork-heads, vertical fork-teeth, and cross-bar connecting the same, and transverse rod connecting the side bars, and notched braces pivoted on said cross-bar and engaging said rod, substantially as described.

8. In a hay-stacker, a fork-tooth having its forward end provided with a detachable point, embracing it upon all sides, substantially as described.

9. In a hay-stacker, a fork-tooth having its forward end provided with a point embracing it upon all sides and provided with the downwardly-projecting prong, substantially as described.

10. In a hay-stacker, a pulley-casting comprising a body portion, ears extending therefrom and a screw-threaded socket for the reception of a brace-rod, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN M. COPENHAVER.

Witnesses:

JAMES WALTON,
SAMUEL COPENHAVER.