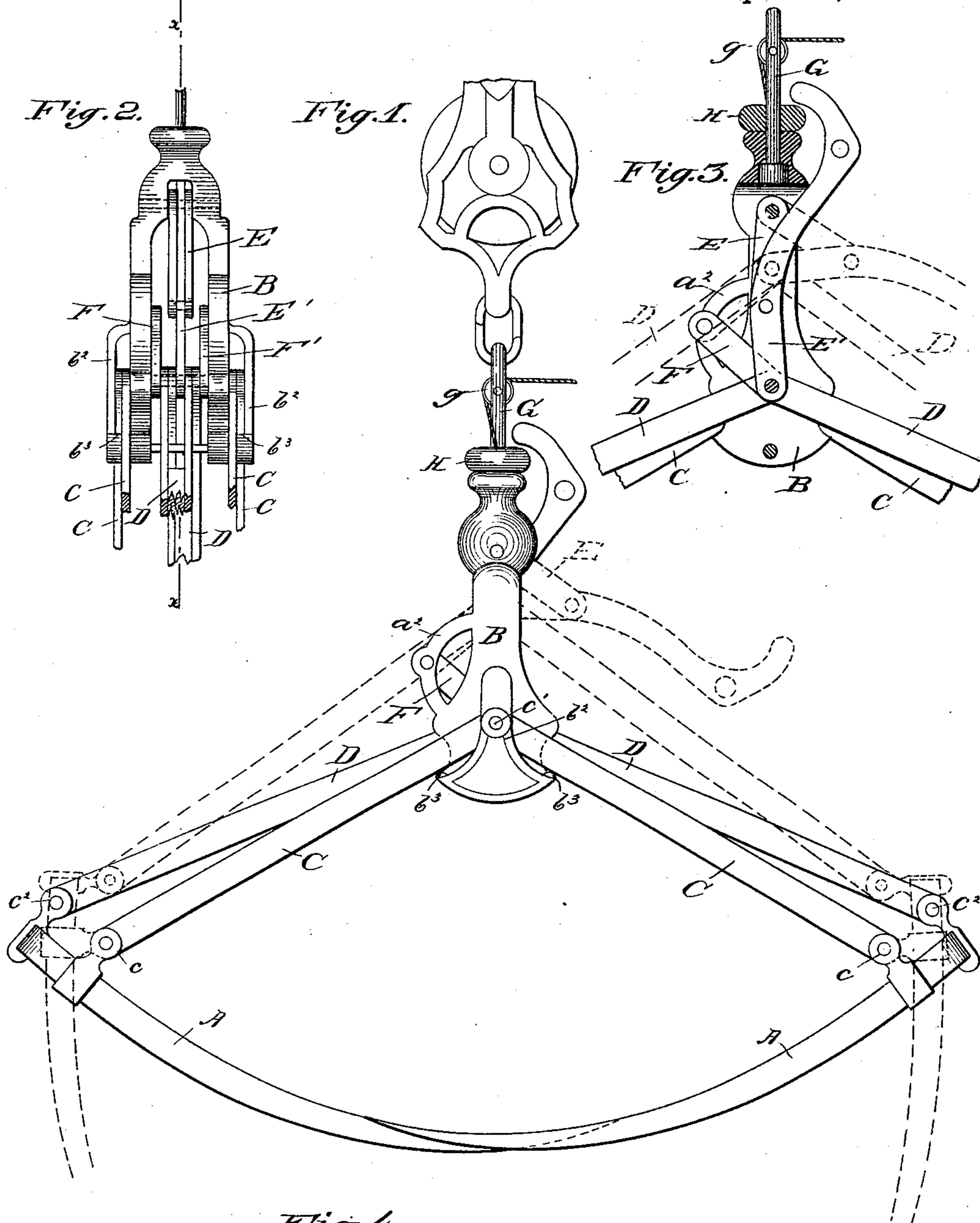


(No Model.)

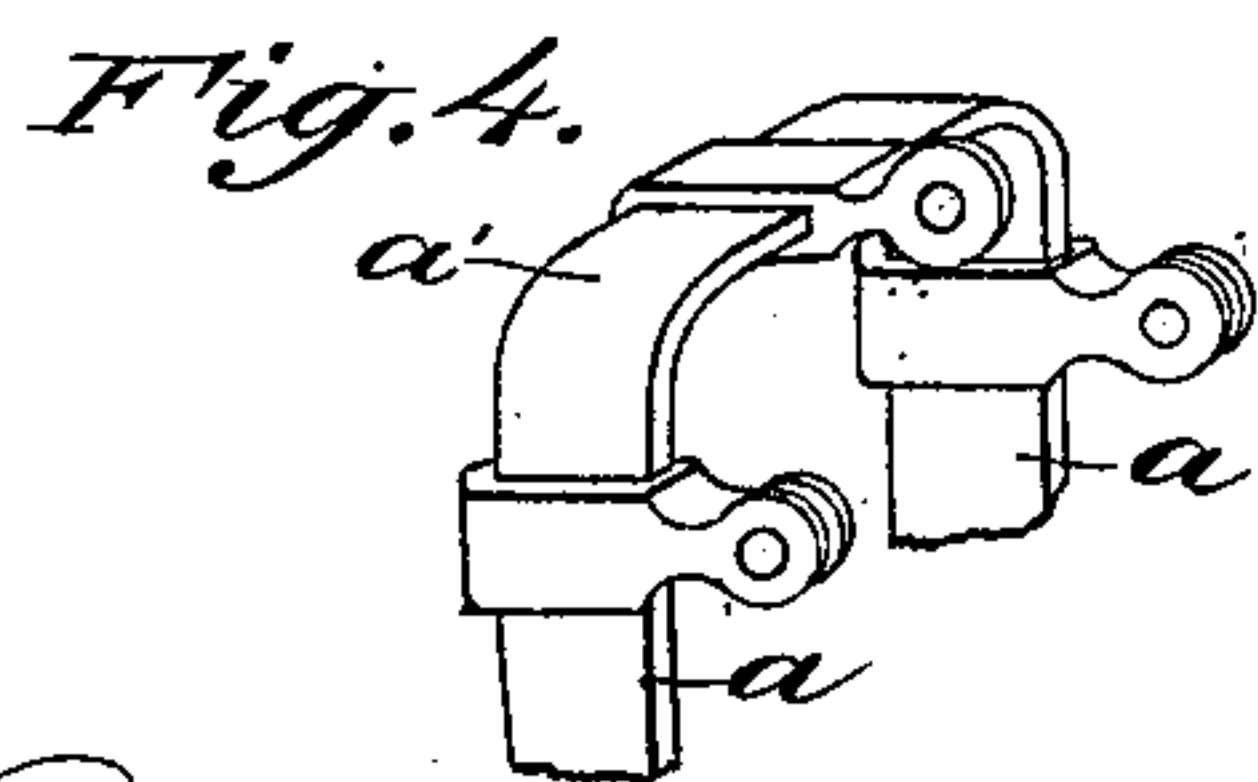
M. W. CHAMBERLAIN.
GRAPPLING FORK.

No. 326,953.

Patented Sept. 29, 1885.



Attest:
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Att'y:

UNITED STATES PATENT OFFICE.

MARCUS W. CHAMBERLAIN, OF BRANCHVILLE, NEW JERSEY, ASSIGNOR OF
THREE-FOURTHS TO E. A. ELY AND F. S. ELY, BOTH OF SAME PLACE,
AND P. A. ELY, OF MADISON, NEW YORK.

GRAPPLING-FORK.

SPECIFICATION forming part of Letters Patent No. 326,953, dated September 29, 1885.

Application filed June 19, 1885. (No model.)

To all whom it may concern:

Be it known that I, MARCUS W. CHAMBERLAIN, a citizen of the United States, and a resident of Branchville, in the county of Sussex and State of New Jersey, have invented certain new and useful Improvements in Grappling-Forks, of which the following is a specification.

My invention relates to an improved grappling-fork, designed, principally, for use in elevating and carrying hay, straw, or similar material.

It consists of two forks pivoted to and connected by two sets of rods to a suitably-shaped head and provided with an operating link-movement whereby the forks may be so held with relation to their connecting-rods as that they will, on the drawing upward of the head, grapple or embrace a load of hay or be allowed to open and loosen their hold on the load.

In the accompanying drawings, Figure 1 is a side view of my improved fork complete. Fig. 2 is a detached view of the head-piece, showing the tripping-link movement. Fig. 3 is a section taken through the head on line x of Fig. 2; and Fig. 4 is a detached view of the fork-head, showing the method of pivoting the same to the connecting-bars.

The construction of my fork is as follows: A A are two forks preferably made with but two tines each, and these tines $a a$ and the head a' made of one piece of metal by bending the same, as shown in Fig. 4. These forks are each coupled to an inverted-U-shaped head-piece, B, by two link-bars, C C, pivoted to the tines of the fork, near its head, by fixed pivotal bearings $c c$, and to the head-piece A by fixed pivotal bearings c' upon the outer sides of the arms, and so arranged that a single pin on each side of said head-piece will serve as a bearing for one bar from each fork. Each fork has pivoted to its upper cross-piece, by means of a fixed bearing, c^2 , a spreader-bar, D, and the spreader-bars from the two forks are pivoted together within the head B and to a toggle-lever, which is itself pivoted to the head, so that by its movement the piv-

oted point of the spreader-bars may be brought into line between the pivoted bearings c' of the connecting-rods C or may be raised above it, as shown in Figs. 1 and 3 in full and dotted lines.

The toggle-lever consists of a double link, E, pivoted within the upper or closed end of the head B, and embracing and pivoted to the lever-link E', which is in turn pivoted to the spreader-bars D D, a single pin serving to pivot the three pieces. The lever-link E' is prolonged at its upper end, bent out and up to extend over the head B when the toggle is spread to bring the pivoted centers of the two sets of bars in line, as shown in Fig. 1 in full lines.

To insure the working of the toggle within the head B, a guide link or links, F, is pivoted at one end to the pin connecting the spreader-bars D with the lever-link E' and at the other end to a laterally-extended portion, a^2 , of the head B.

The toggle-levers E E' are so proportioned and arranged as that when the pivoted points of the spreader-bars D and the coupling-bars C are brought into line the central or pivoted point of the toggle may be thrown over or past the dead-line between its other bearing points, so that a pressure upward by the spreader-bars will not operate the toggle. A downward or lateral pull upon the extended lever-link will force the central point past the dead-line and allow the upper movement of the spreader-bars caused by a load upon the tines of the fork, and the movement of the toggle must be sufficient to allow the complete opening of the fork, so that the load may drop out. Therefore care must be taken to so place the pivotal points upon the forks and to proportion the toggle-lever as to permit this movement.

The head B is provided at its upper end with a swivel-link, G, by which it may be suspended to a hook or pulley-block upon the hoisting-rope.

To trip or open the fork I preferably place a sliding annular disk or wheel, H, upon the swivel-link G, and mount a pulley-wheel, g , up-

on or within said link at or near its upper end, so that a tripping rope or cord may be passed over the pulley *g* and attached to the disk H, so that the latter may be drawn upward upon the link G by a pull upon the rope. The disk H will strike against the upwardly-extended arm E' of the toggle-lever and cause it to be thrown outward to trip the fork. In lieu of this device the tripping-rope may be made fast to the lever itself, a ring or eye being provided therefor in the body of the link.

In order to re-enforce and strengthen the pivoted bearings *c'* of the coupling-bars C, an outer or covering plate, *b²*, is placed on each side of the head B, and this plate is joined to or made integral with said head both above and below the pivoted pin, and this plate is made to extend laterally beneath the connecting-bars to form lugs or bearing-points at *b³ b³*, to prevent the said bars from swinging below a certain predetermined point.

In use the fork is suspended by means of the swivel-link G to a hoist-rope, and is lowered to the hay or other material which it is designed to move, and the toggle-lever is thrown upward, so as to assume the locked position shown in Fig. 1.

The levers C C D are either raised or swung upward on their pivoted bearings till the tines of the fork assume a nearly vertical position and the fork is set in this position upon the hay. An upward pull upon the draft-rope will cause the fork to grapple a considerable portion of the hay, which may be raised by the fork and carried to any point desired.

When it is desired to unload the fork, a pull upon the tripping-rope will open or throw the toggle past its dead-line, and the load will, of its own weight, cause the tines to open, as shown in Fig. 1 in dotted lines.

Various modifications may be made in the mechanical construction of my device, such as making the links double or single, and variation in the pivotal connections between the coupling-bars and the fork; but these details are not essential parts of my invention.

What I claim is—

1. In a grappling-fork, the combination, with two forks coupled by pivoted links to a head-piece, of spreader-bars pivoted at one end to the forks and at the other end to each other and to a toggle-lever pivoted within the head-piece, to operate the pivoted forks, substantially as and for the purpose set forth.

2. In a grappling-fork, the combination of two forks connected by pivoted coupling-bars with a head-piece, and each provided with a spreader-bar, of a toggle-lever pivoted by one end to the head-piece and by the other to the spreader-bars, and adapted to throw the pivotal pin between the spreader-bars into and out of the pivotal line of the coupling-bars.

3. In a grappling-fork, the combination, with two forks linked to a head-piece by pivoted coupling-bars, and provided with pivoted spreader-bars operated by a toggle-lever pivoted within the head-piece, of a guide-link pivoted at one end to the head-piece and at the other to the toggle-lever, and the spreader-bars at their pivotal joint, to govern the movement of said pivotal joint, substantially as and for the purpose set forth.

4. In a grappling-fork, the combination of the two forks A, U-shaped head-piece B, coupling-bars C, spreader-bars D, toggle-lever E E', guide-link F, and swivel-link G, substantially as and for the purpose set forth.

5. In a grappling-fork, the combination, with the U-shaped head-piece and the toggle-levers pivoted therein, of the swivel-link G, provided with pulley *g*, mounted thereon, and the sliding tripping-disk H, substantially as and for the purpose set forth.

Signed at Branchville, in the county of Sussex and State of New Jersey, this 22d day of May, A. D. 1885.

MARCUS W. CHAMBERLAIN.

Witnesses:

JOHN S. DECKER,
ROBT. A. PRICE.