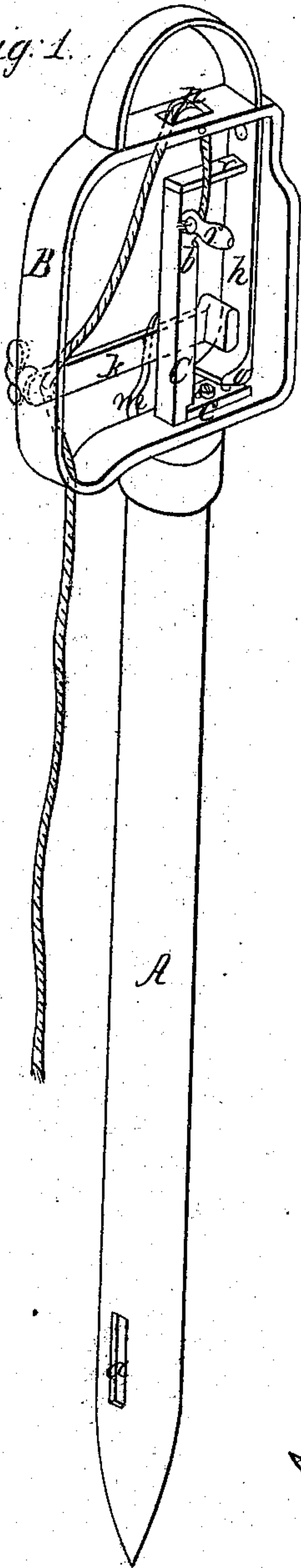


*O. Paddock.*  
*Horse Hay Fork.*

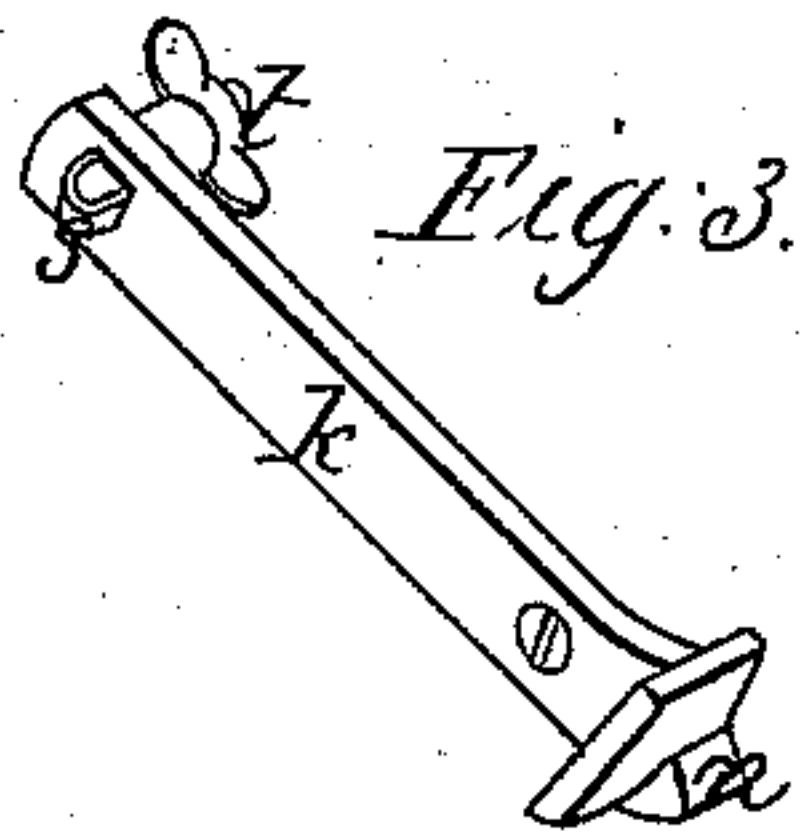
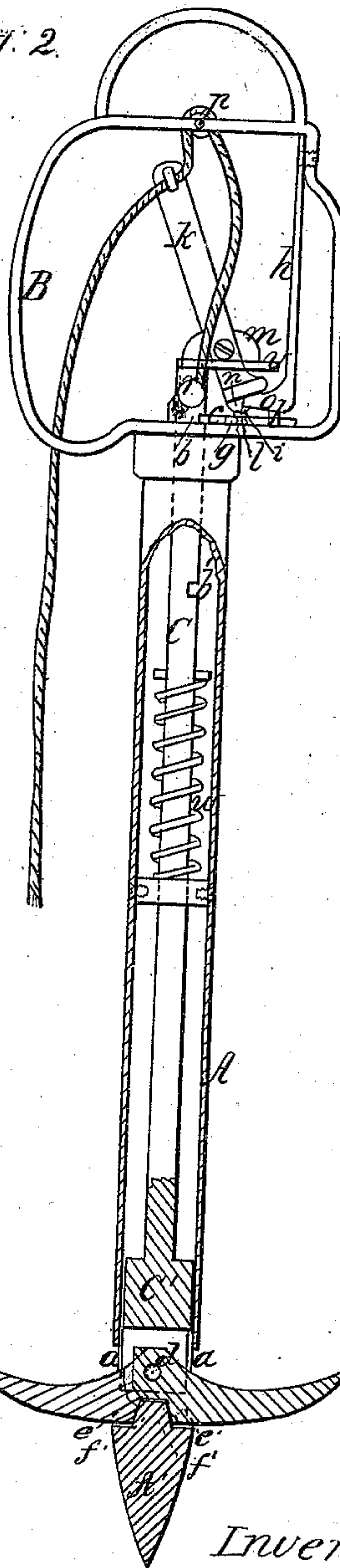
*N<sup>o</sup> 75,786.*

*Patented Mar. 24, 1868.*

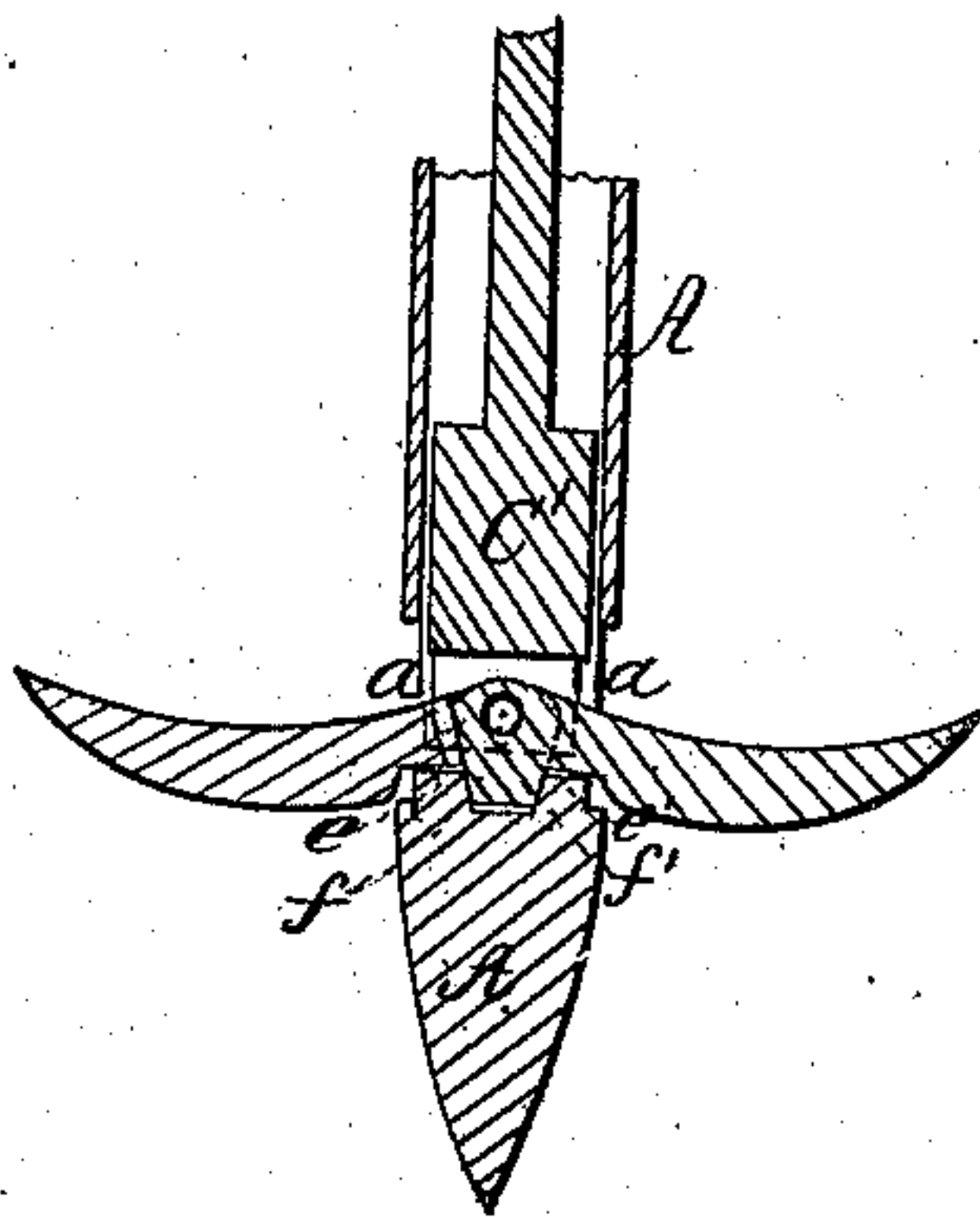
*Fig. 1.*



*Fig. 2.*



*Fig. 4.*



*Witnesses;*  
*Wm. B. Bailey*  
*Chas. Page Jr.*

*Inventor;*  
*Oscar Paddock*  
*by* *A. Pollock*  
*his atty.*



# United States Patent Office.

OSCAR PADDOCK, OF WATERTOWN, NEW YORK.

*Letters Patent No. 75,786, dated March 24, 1868.*

## IMPROVEMENT IN HORSE HAY-FORKS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO WHOM IT MAY CONCERN:

Be it known that I, OSCAR PADDOCK, of Watertown, in the county of Jefferson, and State of New York, have invented certain new and useful Improvements in Hay-Forks; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings.

My invention relates to hay-forks known as harpoon-forks, that is to say, forks in which the claws and barbs are projected from or retracted within a tubular sheath by means of a centre-rod, combined with suitable mechanism for "locking" or "unlocking" the same. The principal object I have in view is to lessen the upward strain or pressure exerted by the claws, when projected from the sheath and loaded, upon the centre-rod and locking-mechanism, and to prevent consequent injury to the latter as well as to the tubular sheath. Each claw or barb may be considered to be a lever, whose inner end presses upward upon the centre-rod with a degree of power which becomes greatly multiplied in proportion to the increased length of that portion of the claw projected from the sheath, and the increased weight sustained by such claw, and, consequently, not only the strain upon the locking-mechanism by which the centre-rod is held in position is very great, but the mechanism is apt to become jammed or wedged in the centre-rod in such manner as to be disengaged therefrom with great difficulty.

As the successful operation of the fork depends, in a great measure, upon the ease and facility with which the locking-mechanism and centre-rod are operated, and as, moreover, the direct upward pressure of the loaded claws upon the rod, locking-mechanism, and sheath, is highly injurious and destructive to the fork, it becomes a great desideratum to so combine these parts as to prevent the evils referred to.

To this end my invention consists essentially of, first, the combination, with the sheath of the fork, of claws or barbs, pivoted to the centre-bar, and provided with shoulders or bearings, which, when the said claws are projected from the sheath, bear against like shoulders or notches formed in or upon the sheath, in such manner that the strain of the load upon the claws shall induce the said claws to bear, with a lateral pressure, against the sheath or shoulder formed in the same, substantially as hereinafter described; second, the combination, with the centre-rod, and claws pivoted to the same, of a spiral spring, or its mechanical equivalent, for effecting the upward movement of the centre-bar, and the retraction of the claws within the sheath, after the bolt or locking-device is disengaged from said centre-bar; third, the locking-mechanism, hereinafter described, in combination with the centre-bar, claws, and spring for effecting the upward movement of the bar; fourth, the combination, with the centre-bar and claws, of the locking-mechanism and rope or equivalent device for operating said mechanism and actuating said centre-bar; fifth, the construction of the locking-mechanism, and its arrangement within the handle by which the fork is suspended.

To enable those skilled in the art to understand and use my invention, I will now proceed to describe the manner in which the same is or may be carried into effect by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a fork constructed in accordance with my invention, with the claws retracted within the sheath.

Figure 2 is a sectional elevation of the same, with the claws projected from the sheath.

Figure 3 is a perspective view of the lever for operating the locking-bolt.

Figure 4 is a vertical central section through the lower part of a fork, representing a modification of my invention.

A is the tubular sheath, provided with the usual slots, *a*, for the passage of the claws, and the solid penetrator or pointed end *A'*. Upon the upper end of the sheath is secured the handle B, in which the locking-mechanism of the fork is enclosed. The centre-rod C, which carries the claws, plays through a square or angular aperture formed in that part of the handle which covers the top of the sheath. The upper portion of the rod, as shown in fig. 1, has a square or angular formation to fit the aperture in the handle, while its lower end, *C'*, fits snugly within the tubular sheath, thus insuring the necessary steadiness of the rod. Two nicks or notches, *b b'*, in the upper end of the rod, in one of which the spring-bolt *c* of the locking-mechanism catches, according as the teeth are projected from or retracted within the sheath, serve to limit the up-and-down movement of the centre-rod.



The claws D are pivoted to the lower end of the part C' of the centre-rod, as shown in the drawings. Confining attention to the claws represented in fig. 2, it will be noticed that in each claw, below the pivotal point *d*, an angular notch or recess is formed, in such manner that, when the claws are projected from the sheath, the notches will fit over a wedge-shaped projection or bearing which rises from the bottom of the sheath, and is permanently secured to or formed in one piece with the penetrator A'.

Now, if it be supposed that the claws thus projected from the sheath are weighted or sustain the usual load, it will be seen that the pressure thus induced by the load will cause the shoulders *e e'* of the notches in the claws to bear laterally against the corresponding faces *f f'* of the bearing, the pressure of the shoulder *e'* being in a direction diametrically opposite, or nearly so, to that exerted by the shoulder *e*. The claws thus exert little or no pressure upon the centre-bar C, and the locking-pin or bolt *c*, by which the latter is held in position, is, therefore, free from all strain, and can be operated with equal ease, whether the claws are loaded or not.

The faces or shoulders, *f e* and *f' e'*, are made slightly inclined or sloping, so as to prevent them from becoming jammed together, which would, at times, happen, if they were made perfectly upright, or at right angles to the bottom of the sheath. The inclination given them is just sufficient to allow the centre-bar to be lifted with facility when the locking-pin is drawn back.

In fig. 4 is represented a modification of the arrangement of the claws shown in fig. 2. In this figure it will be seen that the position of the parts is reversed, the wedge-shaped projection, with the shoulders or faces *f f'*, being formed upon the inner ends of the claws, while the notch or recess, with correspondingly-inclined sides or shoulders, *e e'*, is cut or otherwise formed in the bottom of the sheath. The principle involved, however, as well as the operation and the effect produced, is the same as hereinbefore described, as will be apparent without further explanation; and I may here say that the shoulders *f f'*, in fig. 1, may be formed upon the exterior instead of inside the sheath, the notches in the claws being made of such dimensions that the shoulders *e e'* shall, as before, bear against the inclined bearings *f f'*. The object in any and all cases is to obtain a bearing for the shoulders or projections *e e'* of the claws, so as to transform what would otherwise be a direct upward pressure upon the centre-rod into a lateral pressure against the sheath.

The locking-mechanism, by which the centre-rod is held, consists of the locking-bolt or pin *c*, the spring *h*, to which the bolt is attached, and the lever K, by means of which the retraction of the bolt is effected.

The plate-spring *h* is attached to the upper part of the handle B by means of a screw or other suitable device, as shown in fig. 2, and extends down to near the base of the handle. The bolt *c* is attached to the bottom plate of the handle by means of a screw, *i*, which fits in a slot, *g*, formed in the bolt. The length of this slot is such as to allow the bolt to have a sliding movement, towards or away from the centre, not sufficient to admit of its being caught in or disengaged from one of the notches *b b'*. A pin, *l*, in the rear end of the bolt, engages with the lower end of the spring *h*, so that, when the latter is forced back, the bolt will follow its movement.

In order to thus operate the spring, the lever K is employed. This lever is pivoted or hung upon an arm or standard, *m*, on one side of the handle, in such position, with relation to the spring *h*, that its shorter end, which has formed upon it a cam-projection, *n*, will, when raised or lowered, strike against a like projecting part, *o*, formed on the lower end of the spring *h*. The latter will thus be forced back, carrying with it the bolt *c*.

If, for instance, the longer arm of the lever in fig. 2 be pulled downwards, the cam *n* will strike or force back the spring *h* and bolt *c*, thus unlocking the centre-rod. The latter, after being thus unlocked, is raised by one of the two following means, or by both combined:

In the one case, the rope by which the operator pulls upon the lever passes from the lever up over a pulley or roller, *p*, in the top of the handle, and thence downward to the centre-rod, where it is fastened to a knob, *r*, or other suitable device on the end of the rod. The rope, between the lever and the centre-rod, is somewhat slack, so as to admit of the lever being moved far enough to completely withdraw the bolt *c* from the centre-rod before the rope is drawn tight enough to induce an upward strain upon the rod. In order to thus adjust the rope, it passes through a metal loop or eye, *s*, in the lever, where it is held by means of a set-screw, *t*. By loosening the screw, the rope can readily be drawn through the loop in one direction or the other, so as to secure the necessary "slack" for that part of it between the lever and the centre-rod. When the operator pulls upon the rope, the cam *n* forces back the spring *h* and bolt *c*. By the time this is effected, the rope between the lever and centre-rod has been tightened, so as to draw the rod upward, while, at the same time, the shorter end of the lever strikes against a piece, *v*, which projects from the centre-rod, and thus aids in starting the rod.

In the other case, I employ a spiral or other suitable spring, *w*, which is mounted upon the centre-rod; and within the sheath. This spring is compressed by the downward movement of the centre-rod, and when, as above described, the bolt *c* is withdrawn, the spring will throw up the rod, and retract the claws. When the spring is employed, the rope need be attached only to the lever K. While preferring to arrange the spring as shown in the drawing, it may, however, be placed in the handle, and arranged to effect with equal facility the retraction of the claws.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. A hay-fork in which the centre-rod and claws are combined with the sheath, in such manner that the claws, when projected, shall bear with a lateral pressure against the sheath, or against shoulders or bearings formed therein, so as to relieve the centre-rod from upward pressure or strain, substantially as and for the purposes set forth.

2. The combination of the centre-rod and its pivoted claws, notched, or provided with inclined shoulders, as herein described, with the sheath, and correspondingly-shaped bearings formed in the same, for the reception of said shoulders, substantially as and for the purposes shown and set forth.



3. The combination, with the centre-rod and claws, of the spring, "locking-bolt," and lever, and rope or its equivalent, attached to both centre-rod and lever, under the arrangement and for operation as herein described.

4. In a hay-fork in which the claws and centre-rod are combined with the sheath, as described, I claim the method of raising the centre or elevating-rod and retracting the claws by means of a spring or springs combined with the said rod, substantially in the manner herein shown and described.

5. The combination, with the centre-rod, of the sheath, its handle, and a locking-mechanism for the said rod, attached to and arranged within the said handle, substantially as herein shown and specified.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

OSCAR PADDOCK.

Witnesses:

G. F. PADDOCK,  
J. CLARKE.