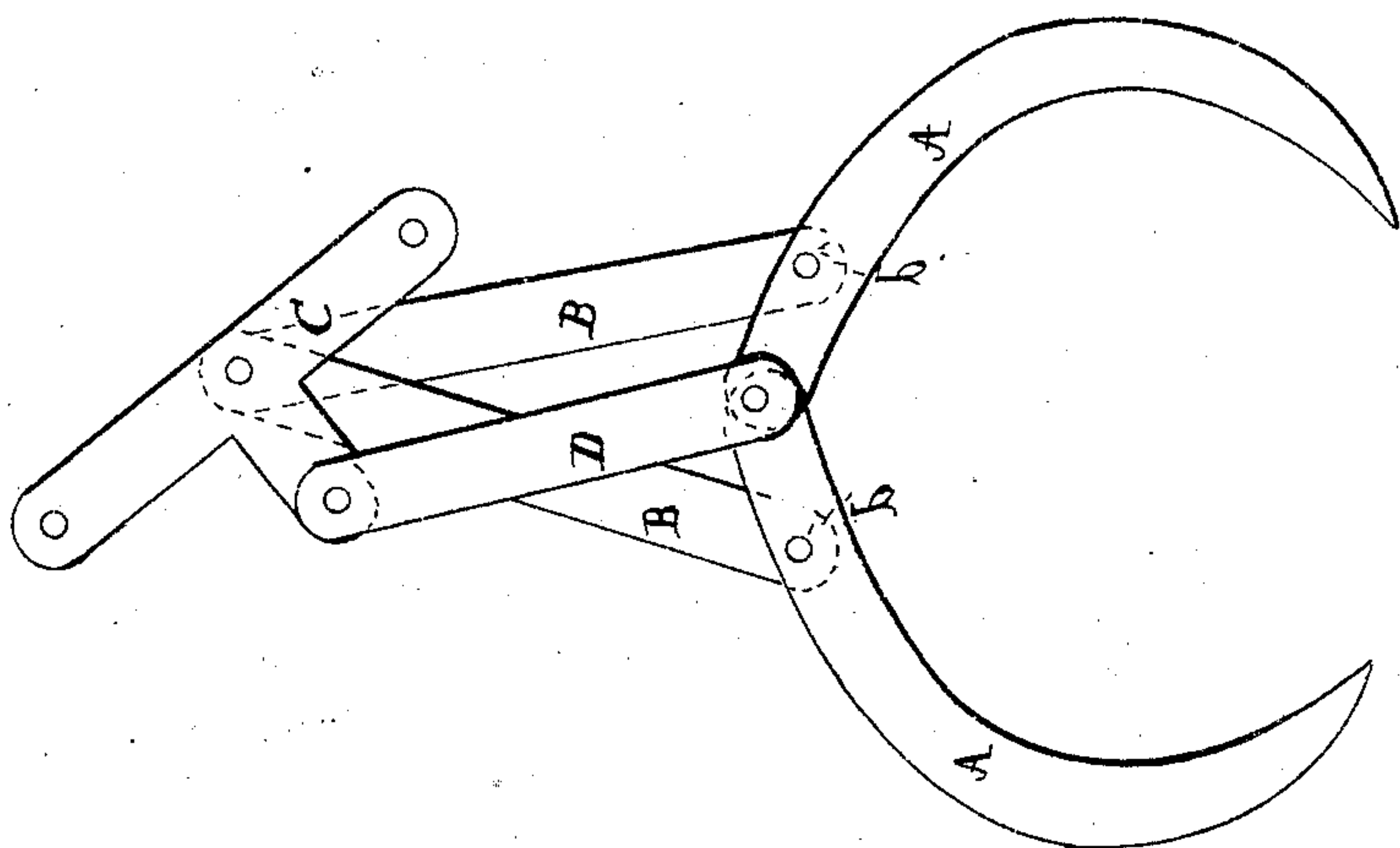


J. K. O'Neil
Hay Fork.

No. 55528

Patented. June. 12. 1866.



Witnesses

W. D. Smith
Thomas T. Parker

J. K. O'Neil

UNITED STATES PATENT OFFICE.

JOHN K. O'NEIL, OF KINGSTON, NEW YORK.

IMPROVEMENT IN HORSE HAY-FORKS.

Specification forming part of Letters Patent No. 55,528, dated June 12, 1866.

To all whom it may concern:

Be it known that I, JOHN K. O'NEIL, of Kingston, in the county of Ulster and State of New York, have invented a new and Improved Hay Elevator or Grapple; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in hinging two curved fingers or tines at their upper ends and pivoting them to two suspending-arms at points equidistant from and on either side of said hinge, and opening or closing said fingers by means of a cross-lever attached to the upper ends of said arms and connected with said fingers at their hinge by a rod which is pivoted to said cross-lever at a point more or less distant from the center upon which said cross-lever vibrates, so that as said lever moves upon its said center the connecting-rod will be drawn up or thrust down and the fingers closed or opened.

The figure in the drawings represents a perspective view of my invention.

That others skilled in the art may understand its construction and operation, I will more particularly describe it.

A A are the tines, hinged to each other at their upper ends at the point *a*. These tines are suspended and supported by the two arms B B, and are pivoted to said arms at the points *b b* equidistant from the point *a*. The arms B are pivoted at their upper ends to the cross-lever C, to the ends of which the suspending cords or ropes are attached.

It is evident, now, that if the hinge *a* can be depressed in relation to the joints *b b* the fingers or tines A A will be caused to separate at their points and open, and if the hinge *a* can be elevated in relation to said joints, then the fingers will be made to close. These movements of the fingers are required in grappling any object or substance to be elevated, and in releasing the same. They must also be fully under control of the attendant or operator, and to make them so I proceed as follows:

The connecting-rod D is attached to the fingers or tines A by a pivot-bolt at their hinge

a, and is pivoted to the cross-lever C at a point more or less distant from the center upon which it moves. It is manifest, then, that as the said lever moves up or down the rod will be drawn up or thrust down, and the hinge *a* will be moved in the same direction, causing the fingers to be closed or opened.

When the hinge *a*, the center upon which the cross-lever C moves, and the pivot connecting the rod D with said cross-lever all come in line with each other the fingers will be locked—that is, no power applied to the points of the fingers or tines A would be able to change their relative position, because such power would be exerted directly in line with all the centers, and therefore could not exert any moving leverage upon any of the parts.

The parts may be so arranged respectively as to produce this line of dead-centers, either when the fingers or tines A A are opened or closed, as may be desired, and such change will not involve any change in the principle of the machine, but merely a change of the location of the pivot attaching the connecting-rod to the cross-lever in respect to the center of that lever's motion.

It is also evident that any required number of tines may be operated in this way if, for any purpose of grappling, it should be found that two is not the proper number.

In operation this grapple is suspended by a cord or rope attached to one end of the cross-lever C. This cord or rope may be passed over a pulley, or in any other way caused to elevate the grapple. The end of the cross-lever attached to the elevating-rope is, of course, drawn upward in respect to the center upon which said lever moves, and the consequence is the fingers or tines are thereby brought into position to grapple the object or substance to be elevated. When the tines are to release the object or substance being elevated the other end of the cross-lever C is elevated by a supplementary cord attached for that purpose, and this reverses the motion of the tines, so as to allow the grapple to free itself.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Operating the tines or fingers of a grappling-fork by means of a rod connecting said tines or fingers with a pivoted cross-lever, said rod being pivoted to both tines and lever at a distance from their centers of motion, as set forth.

2. The cross-lever C, in combination with

the arms B B, fingers or tines A A, and connecting-rod D, as and for the purpose described.

JOHN K. O'NEIL.

Witnesses:

R. W. TAPPEN,

E. T. VAN NOSTRAND.