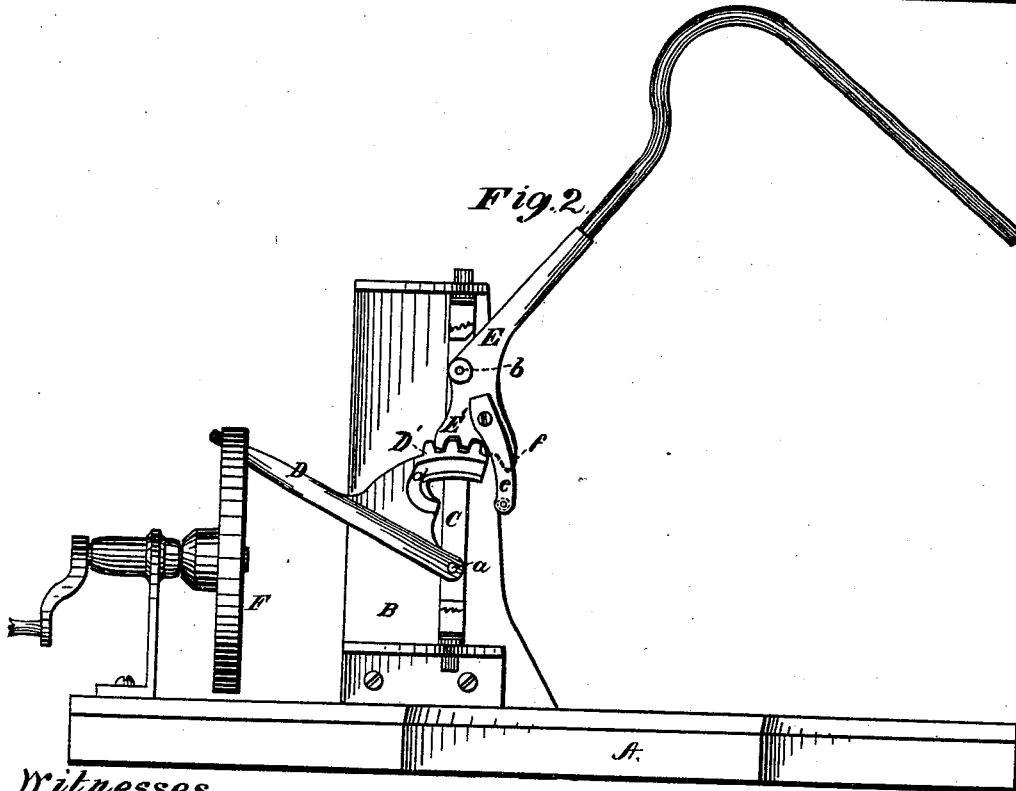
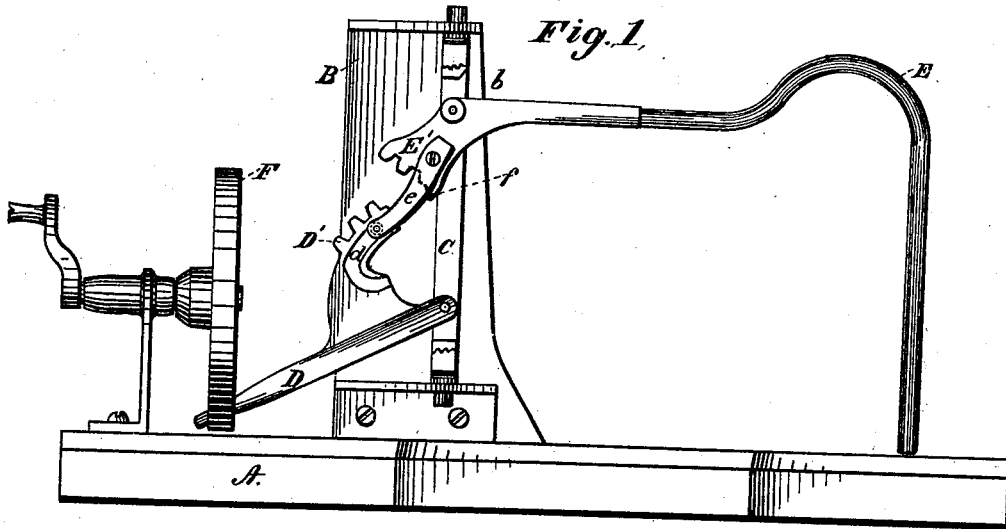


W. A. SUTPHIN.  
Mechanical Movements.

No. 196,951.

Patented Nov. 6, 1877.



Witnesses  
*L. Bond*  
*John C. Foster.*

Inventor.  
*W. A. Sutphin.*

# UNITED STATES PATENT OFFICE.

WM. A. SUTPHIN, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **196,951**, dated November 6, 1877; application filed November 1, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM A. SUTPHIN, of Washington city, District of Columbia, have invented a new and Improved Mechanical Movement, which improvement is fully set forth in the following specification and accompanying drawing, in which—

Figures 1 and 2 are side elevations, (the outside of the rocking and arm-supporting post being broken away,) showing the vibrating, rising, and falling arm in different positions.

The object of my invention is to furnish a device by which, from a continuous rotary motion of the driving or crank wheel, a horizontal or straight path is given to the swinging arm in one direction, and a swinging, rising, and falling movement to the same in the opposite direction.

In the drawing, A is the table or support; B, the support for the post carrying the swinging arm, which support may be of any desired shape to adapt it for the particular purpose to which the device may be applied. C is a post or rock-shaft, journaled in the support or frame B, and in which are pivoted the crank-shaft D and arm E.

The wheel F, which has a suitable journal-support, has rotary motion imparted to it by any preferred means. The arm D is attached to the post C by a pivot-pin, *a*, which coincides with the axis of the wheel F; and the opposite end of said arm is journaled in the wheel F, so that as wheel F is rotated the end of the arm journaled therein is carried with it in its revolution, giving only a rocking motion to the post C. The arm E is attached to the post C by the pivot-pin *b*, which allows it free vertical play, but is carried by said post in its rocking movement.

To control the movement of the arm E, I construct the arm B with a sector-rack, D', and a groove, *d*, both concentric with the pivot-pin *a*, and the arm E is provided with a sector-rack, E', and a locking-arm, *e*. Said arm may be made solid with or attached to the arm E or rack E'.

As the crank-wheel raises the arm D, the rack D' is made to engage with the toothed sector-rack E' on the arm E and cause said arm to have a rising and falling motion. To

give the arm E a horizontal or straight movement during a portion of the rotation of the wheel F, I proportion the racks D' and E' so that they are engaged only during a portion of the rotation of said wheel F, and provide the locking-arm *e* on the arm E with a projecting pin and friction-roller, which engage with the groove *d* on the arm D, so that when the racks are disengaged the groove *d* will, through the locking-arm *e*, hold the arm E in a fixed position relative to the table, over which it swings by the rocking movement of the post C. To insure the engagement of the rack D' with that of E', I construct a projection or elongated tooth, *f*, on the lower or inner side of the rack E', so that as the arm D is raised the end of the rack D' will abut against said projection and raise the arm E until the teeth of the racks have fully intermeshed.

To insure the entire control of the arm E, the groove *d* is made of sufficient length and of proper curve at its lower end to control the arm *e* until after the racks have become fully engaged.

The relative proportions of the racks D' and E' may be varied so as to give the arm E a greater or less swinging movement on the pivot-pin *b*.

The construction of the racks D' and E' may be varied so as to have an eccentric form, and thus give an increasing or diminishing throw of the arm E; or the racks may be extended so as to be engaged continuously, thus obviating the necessity of using the groove and lock arm.

When the device is so constructed or adjusted as to have the post C in a vertical position, the arm E will derive from said post a movement in a horizontal plane. It is obvious, however, that the post may be placed horizontal, or at any angle between a perpendicular and a horizontal, in which case the straight path, in the movement of the arm, will be correspondingly changed.

The above-described mechanism is adapted to use in grain-rakes and automatic grain-binding machines, as well as to various other purposes where a similar movement is desired.

What I claim as my invention, is—

1. The combination, substantially as herein-before set forth, of the wheel, the crank-arm

journalled therein and provided with the segmental rack, the post, and the vibrating and swinging arm provided with its rack, whereby a reciprocating rising and falling motion is imparted to the arm.

2. The combination, substantially as hereinbefore set forth, of the post, the crank-arm provided with rack and groove, and the swinging

arm provided with rack and locking-arm, whereby the arm E is raised and lowered in one part of its movement, and locked and carried in a straight path in another part thereof.

WM. A. SUTPHIN.

Witnesses:

L. L. BOND,  
JOHN C. TASKER.