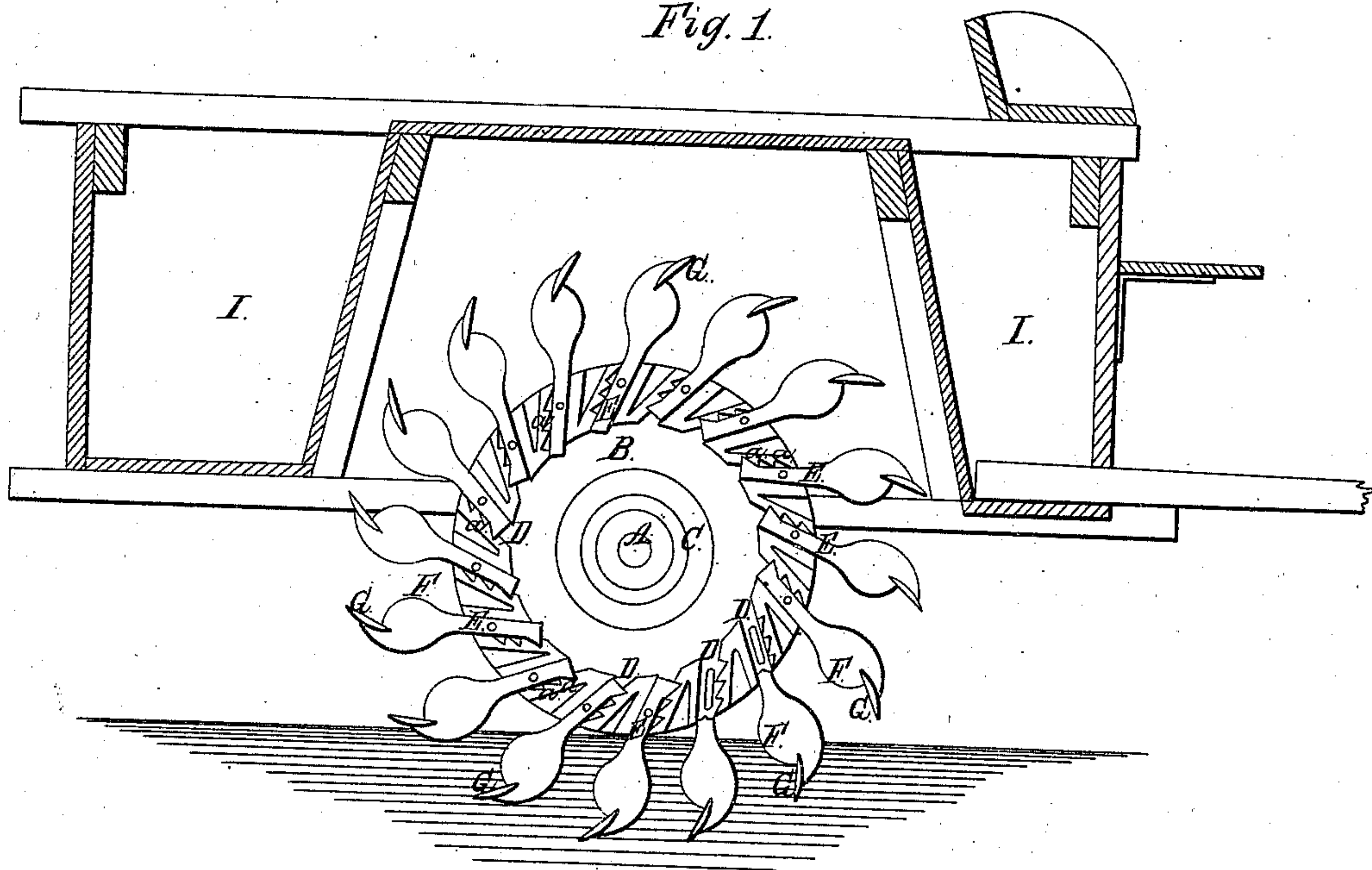


*F. C. Cone.*  
*Stranding Mach.*

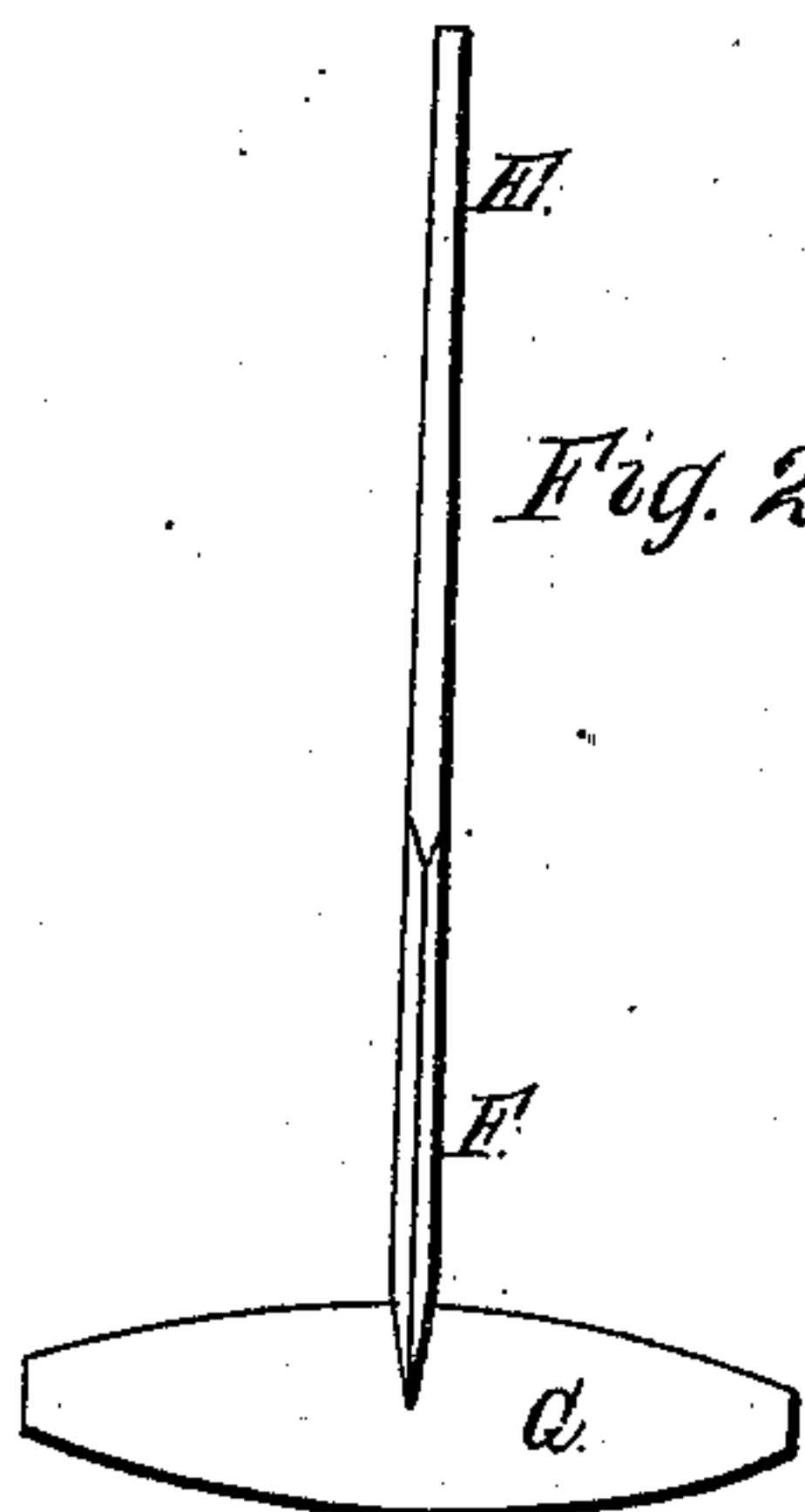
*Nº 88,368.*

*Patented Mar. 30, 1869.*

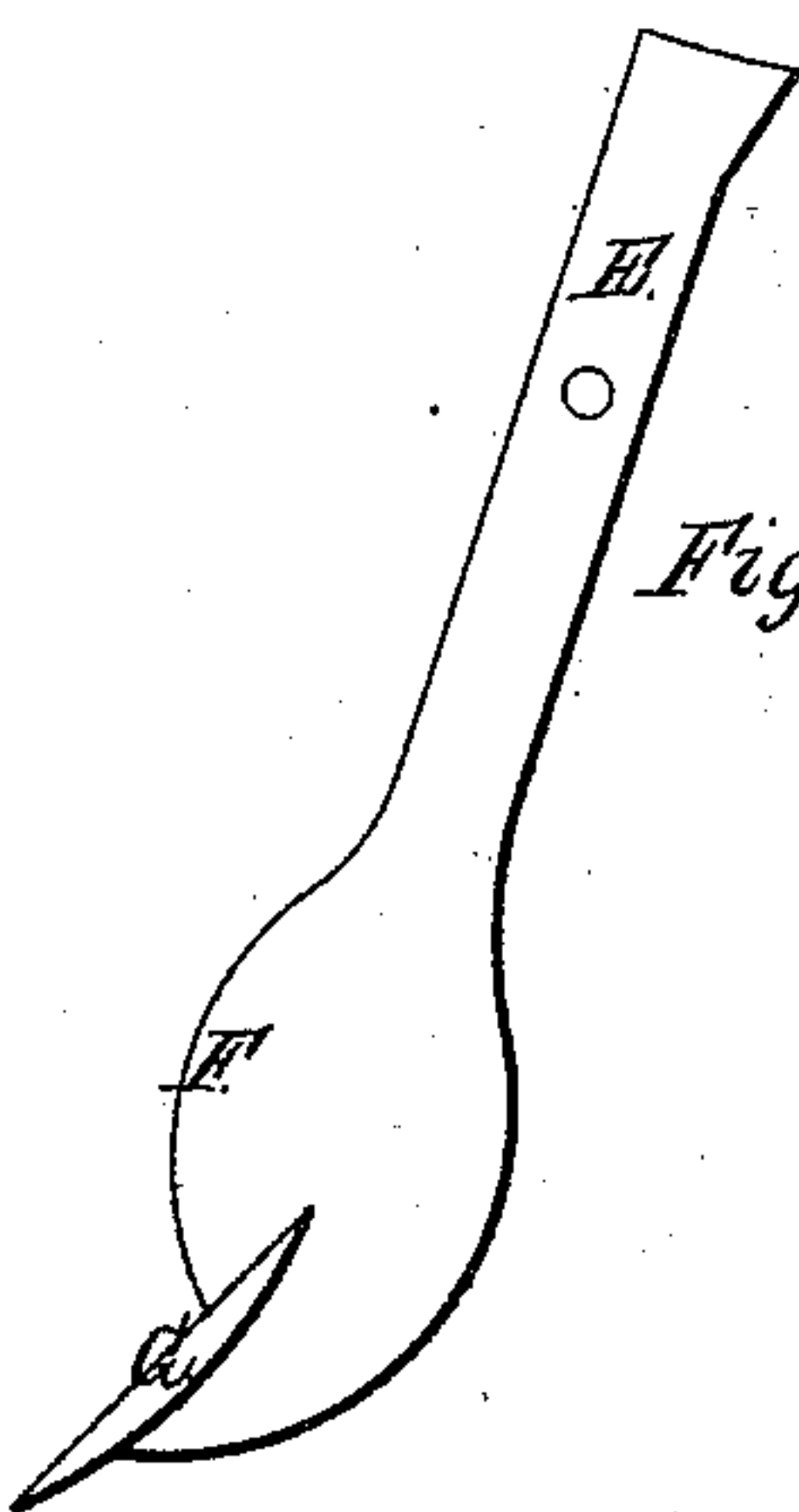
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses.*

*Geo. H. Strong*  
*J. L. Boone*

*Inventor.*

*Francis C. Cone*  
*By his attys*  
*Dewey & Co.*



# United States Patent Office.

FRANCIS C. CONE, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 88,368, dated March 30, 1869.

## IMPROVEMENT IN SPADING-MACHINES.

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

To all whom it may concern:

Be it known that I, FRANCIS C. CONE, of the city and county of San Francisco, State of California, have invented an Improved Spading-Machine; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvements without further invention or experiment.

The object of my invention is to provide an improved machine for turning up and pulverizing the soil and preparing it for seeding; and

It consists in a series of flanges turning loosely on a bearing-shaft, and each having a number of arms extending outward from its periphery.

At the end of each arm is a spade or knife extending across, at right angles to the travel of the machine. These spades are placed at such an angle as to enter the ground vertically, as the flanges revolve; and the arms are so placed in and attached to the flanges, that the depth to which the spade enters the ground may be varied, the distances between their edges always remaining equal to the distance from the edge of the flange, however it may be varied.

The arm is so formed as to give a peculiar cutting-edge, which is extremely effective in breaking up the turf and clods.

It also consists in so arranging the body of the machine, that the angle at which it stands, with reference to the earth, may be varied.

Weights may also be used to increase the effectiveness of the spades.

To more fully describe my invention, reference is had to the accompanying drawings, forming a part of this specification, of which—

Figure 1 is a side sectional elevation of my machine.

Figures 2 and 3 are views of the knives.

Similar letters of reference in each of the figures indicate like parts.

A is a shaft, of the desired length, each end turning in boxes on the body of the machine, which is supported by it.

A number of flanges, B, is placed on the shaft, and turn loosely, the hubs C being made of sufficient length to hold the flanges at a certain distance apart.

Around the rim of the flanges, slots D D are made, which extend toward the hub, and which, if continued, would form tangents to a circle situated between the centre and rim of the flange.

The angle of these slots is so calculated that when the arms carrying the spades are in their places, the distance between their edges and the distance of their

edges from the rim will be equal, whether the arms be lengthened or shortened.

The arms E E, which carry the spades, are made to slide in the slots D, and may be set so as to make a deep or shallow cut with the spades, by means of the notches, or shoulders *a a* in the sides of the slots D, the arms having corresponding lugs swaged to fit them, and the whole is held firmly by a screw passing through the arm and flange.

The arms are made with a cutting-edge, F, of peculiar shape, toward the end, so as to thoroughly break up the clods.

At the ends of the arms, the spades G are placed, at an angle to the arm, so determined that they shall enter the ground vertically.

These spades extend across the arms, at right angles with the line of travel of the machine, and are of such a length as to clear those of the succeeding flange. They are also made narrow from their inner to their outer edge, this being very important, as it reduces the friction and secures a complete turning of the soil.

The body, which is supported on the shaft A, has two chambers, or boxes I I, which may be filled with earth, stones, or any heavy substance, to make the spades efficient in hard soil.

By the peculiar shape of the spades, and the angle at which they are placed, they enter the soil vertically, and gradually turn as they pass to the lowest point of the cut, and from thence until they emerge, and thus break and pulverize the earth and drop it behind them, this being effected by making the spades narrow from the inner to the outer edge, while the clods and turf are thoroughly cut and broken up by the cutting-edges of the arms.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The above-described machine-spade, when provided with an adjustable arm, E, and a cutting-edge, F, projecting in front of the blade G, substantially as set forth.

2. The revolving flanges B, having the tangential slots D, for determining the angle of the spades, substantially as herein described.

3. The notches, or shoulders *a a* in the sides of the slots D, for holding the spades, substantially as herein described.

In witness whereof, I have hereunto set my hand and seal.

Witnesses: FRANCIS C. CONE. [L. s.]

J. L. BOONE,  
GEO. H. STRONG.