

(No Model.)

F. H. FERRIS.  
SPRING TOOTH HARROW.

No. 485,324.

Patented Nov. 1, 1892.

FIG. 2-

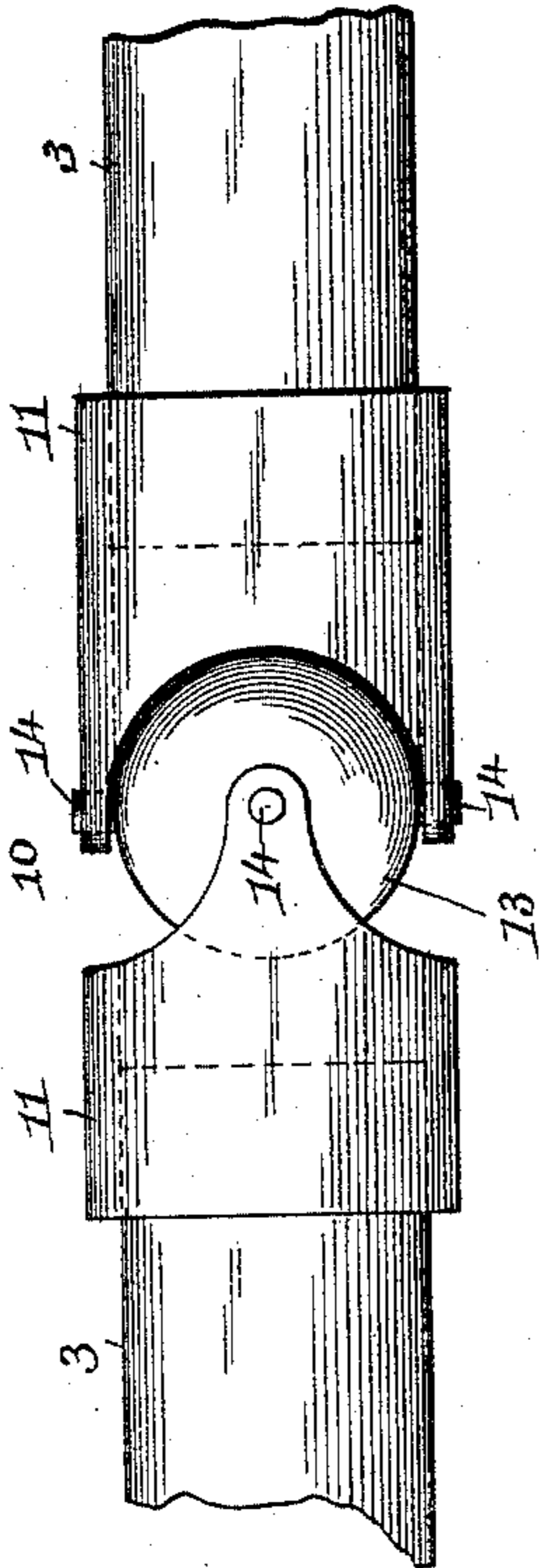
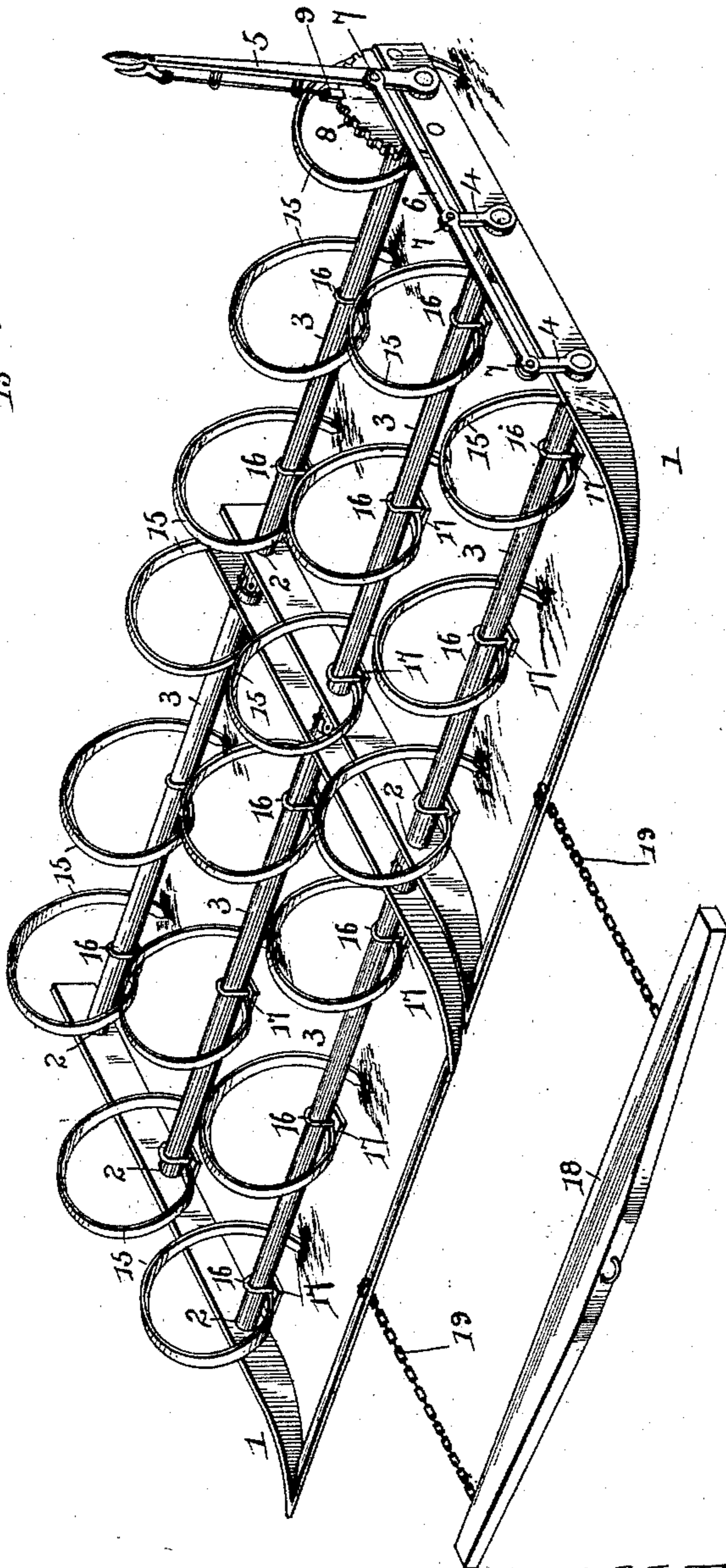


FIG. 1-



Witnesses

Jas. K. McHatfran  
John B. Diggers.

Inventor

Fred H. Ferris

By his Attorneys,

Chas. Snow & Co.

# UNITED STATES PATENT OFFICE.

FRED H. FERRIS, OF KETCHUM'S CORNERS, NEW YORK.

## SPRING-TOOTH HARROW.

SPECIFICATION forming part of Letters Patent No. 485,324, dated November 1, 1892.

Application filed March 26, 1892. Serial No. 426,559. (No model.)

*To all whom it may concern:*

Be it known that I, FRED H. FERRIS, a citizen of the United States, residing at Ketchum's Corners, in the county of Saratoga and State of New York, have invented a new and useful Spring-Tooth Harrow, of which the following is a specification.

My invention relates to improvements in spring-tooth harrows of that class comprising a series of harrow-sections or a gang thereof.

The objects in view are to provide a simple and convenient means for simultaneously operating or throwing into and out of position for operation the several series of teeth of each harrow-section, and, furthermore, to provide a simple and universal joint or flexible connection between the harrow-sections.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claim.

Referring to the drawings, Figure 1 is a perspective of a harrow constructed in accordance with my invention. Fig. 2 is an enlarged detail of one of the connections between the harrow-sections.

Like numerals of reference indicate like parts in all the figures of the drawings.

In practicing my invention I employ two or a series of U-shaped frames 1. If desired, the frames may be of any other shape and may be formed of wood or metal, though I herein show and prefer to construct the same of U shape and of light metal. Each of the frames 1 have their opposite longitudinal sides or terminals provided with transversely-opposite bearing-openings 2, and in each pair of bearing-openings there is mounted for oscillation or rocking a cylindrical harrow-bar 3, the number of which may be increased or decreased, as may be desired, over the number herein shown. The inner ends of these harrow-bars project beyond the inner side bars of the harrow-sections, as do also the outer ends of said bars project beyond the outer bars of the harrow-sections, and the latter ends of one section have mounted thereon short rock-arms 4, the rear harrow-bar of the series provided with the said rock-arms being provided with a lever 5 in lieu of the aforesaid rock-arms. A connecting-rod 6 is pivoted, as at 7, to each of the rock-arms and to the lever, whereby the

movement of the latter will be communicated to each of the harrow-bars of that section. A toothed locking-standard 8 is located at one side of the lever, and a locking-bolt 9 is mounted for reciprocation upon the lever 5, the lower end of the bolt being designed to take into the notches of the locking-standard, and thus lock the harrow-bars at any point. The inner ends of the meeting harrow-bars of the sections are connected by gimbal-joints 10, and these are constructed as is best shown in Fig. 2. Each joint consists of a pair of cylindrical castings 11, secured fixedly upon the end of a harrow-bar, and each of these castings has its outer end bifurcated to form bearing-lugs, those of one casting being arranged at an angle or opposite to those of the other. A cast-metal ball 13 is located between and embraced by the pairs of lugs, and trunnions projecting from diametrically-opposite points of the ball and indicated as 14 take bearing in the aforesaid lugs of the castings. As will be observed, this composes a gimbal-joint adapted to act universally, and it is thus that the harrow-sections are connected, so that each may operate independently of the other and rise and fall with the undulations of the ground.

The harrow-bars are each provided with a series of spring-teeth 15, which may be secured thereupon in any suitable manner, preferably by clips 16, passing around and embracing the harrow-bars and having their terminals passed through plates which take under the shanks of the teeth, as indicated at 17.

18 designates an ordinary doubletree or draft-bar, and the ends of the same are connected with the harrow-sections by draft-chains 19.

This completes the construction, and the operation will at once be obvious. By manipulating the lever 5 in the manner before described it will be seen that the entire series of harrow-bars may be rocked thereby and the teeth swung down to an operative position or else elevated out of such position, whereby the harrow may be transported or dragged to and from the field. By manipulating the lever 5 it will also be understood that the tooth may be adjusted to a desired extent, so as to penetrate more or less deeply into the ground. It will also be understood that the frames 1 may

be of any desired formation and that in the present instance by bending the side bars thereof upwardly at their front ends the said side bars are adapted to constitute runners 5 when the harrow is being dragged to and from the field of operation and the transverse front bars are prevented from collecting trash.

Having described my invention, what I claim is—

10 In a harrow, the combination of the independent rectangular harrow-sections arranged side by side, the rock-shafts pivoted in the side bars of the sections, the spring-teeth carried by said shafts, the gimbal-joints connect- 15 ing adjoining ends of the rock-shafts to con-

nect the sections, said joints being located between the adjacent side bars of the sections, the rock-arms attached to the projecting ends of the shafts at the outer side of one of the sections, a lever attached to one of the rock- 20 shafts, and a connecting-rod fulcrumed to said rock-arms and lever, all substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 25 the presence of two witnesses.

FRED H. FERRIS.

Witnesses:

MARK T. FERRIS,  
Mrs. F. H. FERRIS.