

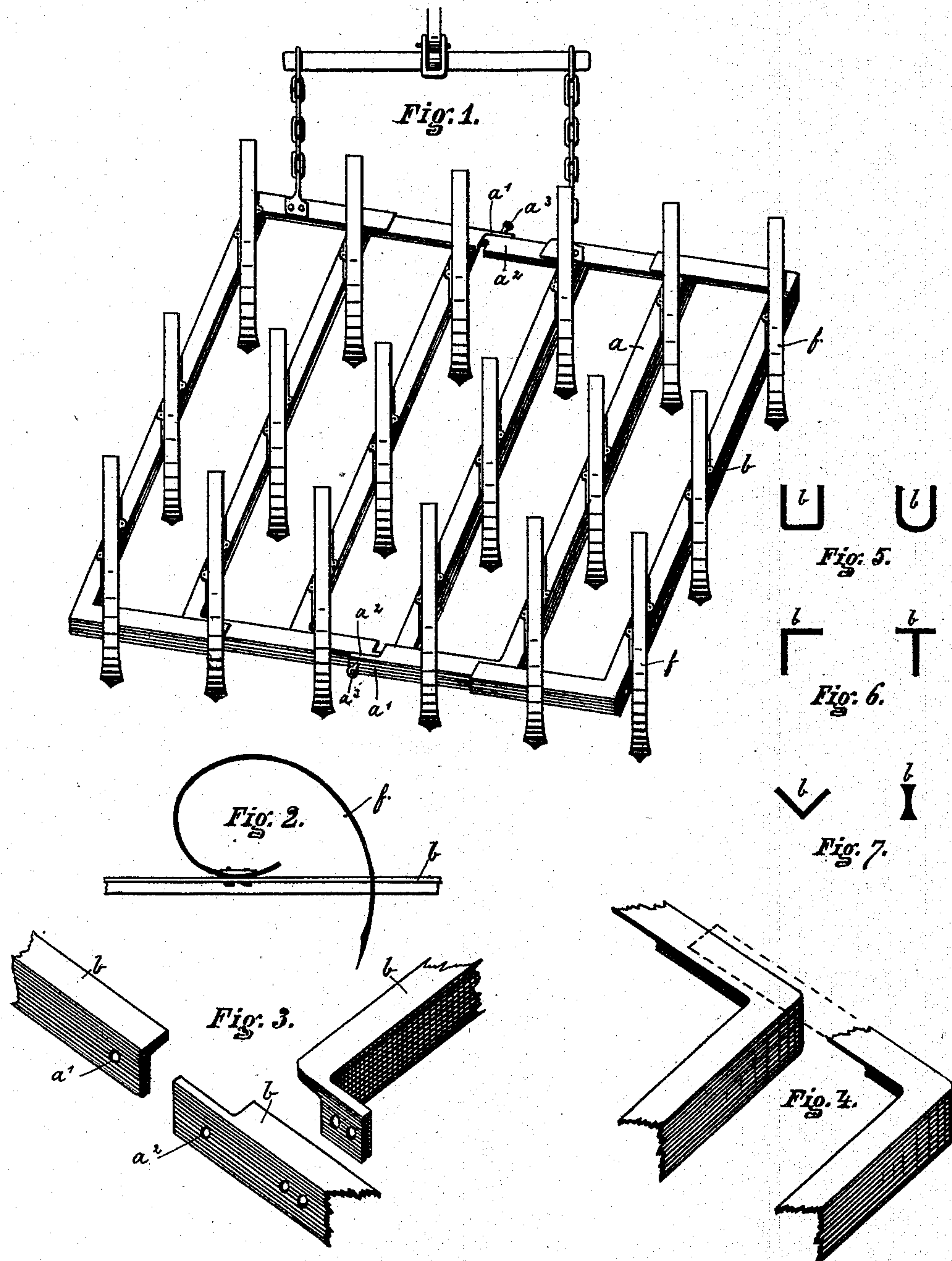
(No Model.)

2 Sheets—Sheet 1.

DE WANE B. SMITH.  
HARROW.

No. 413,352.

Patented Oct. 22, 1889.



WITNESSES.  
Rich. George.  
Edw. H. Riley

INVENTOR.  
D. B. Smith  
By Riley & Perry  
attys

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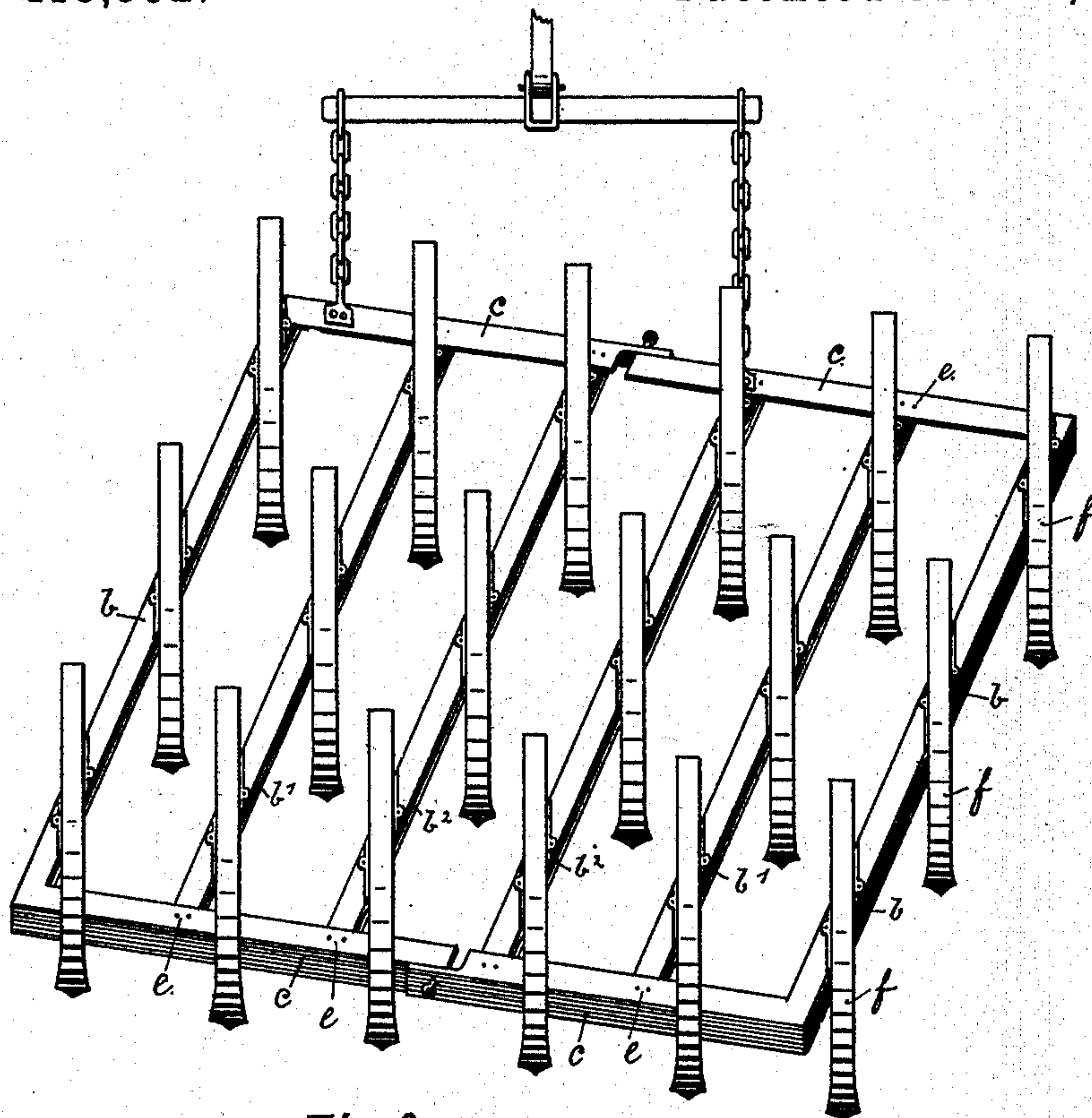


Fig. 8.

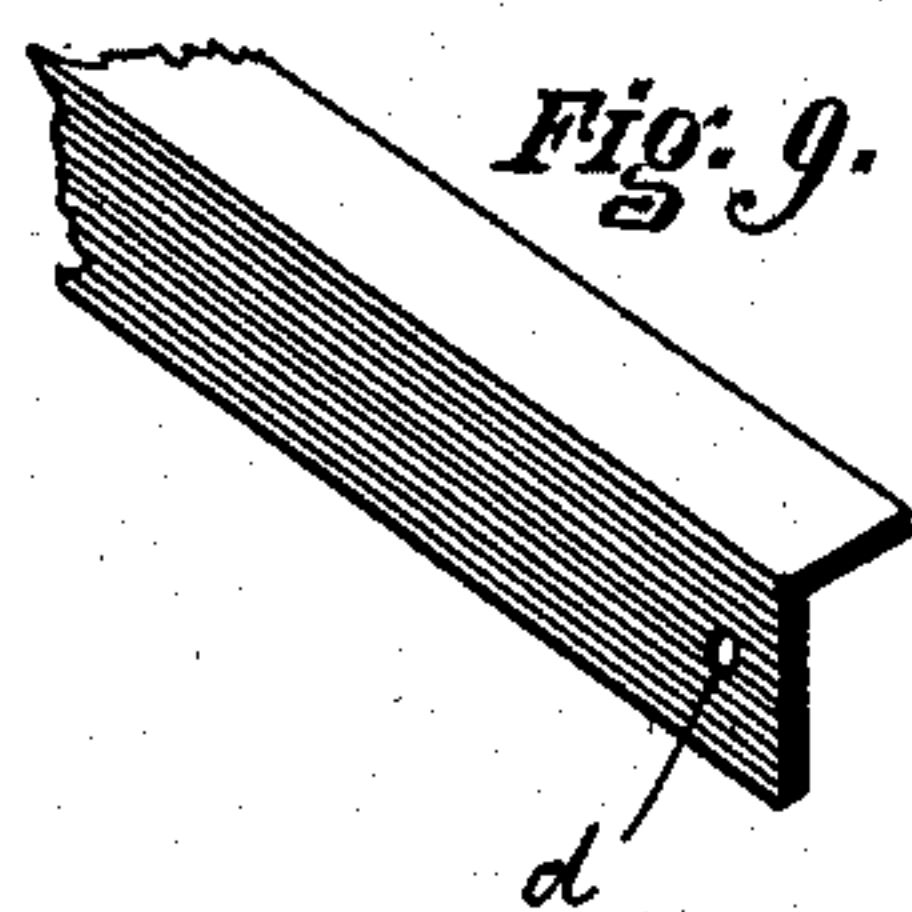


Fig. 9.

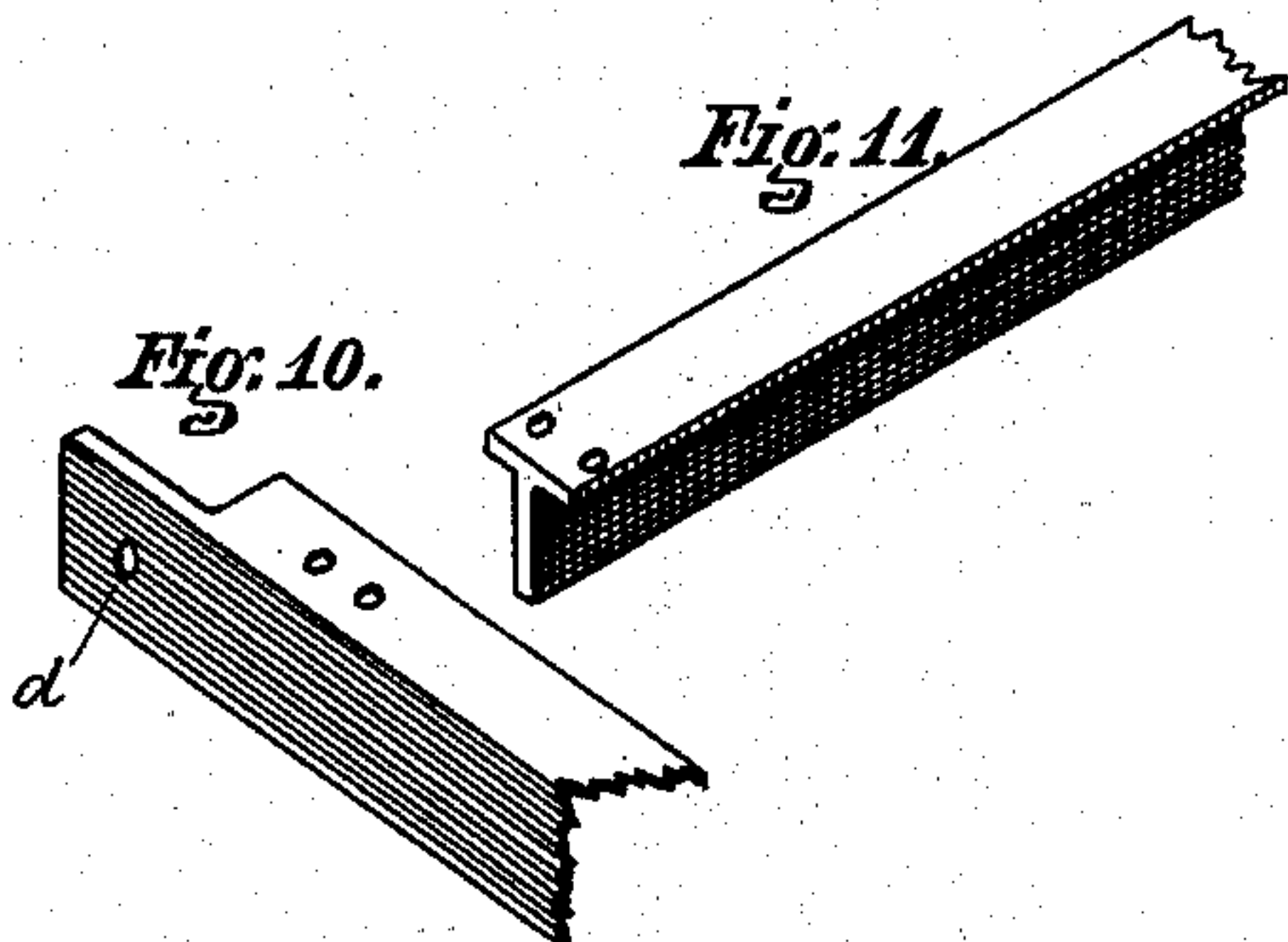


Fig. 10.

Fig. 11.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

DE WANE B. SMITH, OF DEERFIELD, ASSIGNOR TO J. M. CHILDS & CO., OF  
UTICA, NEW YORK.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 413,352, dated October 22, 1889.

Application filed March 22, 1888. Serial No. 268,148. (No model.)

*To all whom it may concern:*

Be it known that I, DE WANE B. SMITH, a citizen of the United States, and a resident of Deerfield, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Harrows; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to an improvement in harrow-frames; and it consists in the mechanism hereinafter pointed out and claimed.

In the drawings, Figure 1 represents a top view of a harrow embracing features of my invention. Fig. 2 is a side view of a section of the angle or channel iron frame with a spring curved tooth mounted on the frame. Figs. 3 and 4 show portions of the frame. Figs. 5, 6, and 7 illustrate the different forms of angle or channel iron used in my improved frame. Any other form of angle-iron may be used. Fig. 8 is a plan view of a metal-frame harrow of a modified construction. Figs. 9, 10, and 11 represent portions of the frame, showing modifications of construction.

It is found by the use of curved spring-tooth harrows, where the frame is formed of draw-bars and cross-beams, that the material or earth works up between the draft-bars and cross-bars, thereby clogging the harrow. To overcome this difficulty I construct my frame of angle-iron, which, from its peculiar shape and construction, enables me to build a frame both light and strong, thus enabling me to dispense with the intermediate cross-bars and use only end cross-bars, thus freeing the frame from many of the objectionable features heretofore encountered in harrow-frames provided with a central joint and with several cross-bars. I preferably construct the frames of angle or channel iron, as these forms of construction are stiffer and more suited to the form of construction with which I am familiar.

I provide or construct my harrow-frame preferably in two sections formed by a central joint, which is formed by the projecting straight perforated ends of the cross-beams  $a'$  and  $a''$ , which are placed together and overlap each other, forming a hinge or joint by inserting bolts  $a^3$   $a^3$  through the perforations of the projecting ends of the cross-bars. The angle or channel draft-bars  $b$  are bent at an angle at each end, the angles being of sufficient length to overlap the angles on the succeeding draft-bars, as shown in Figs. 1 and 4 of the drawings, and are bolted or riveted together. Each succeeding draft-bar is formed in substantially the same way until the required number are provided. The angles of the inner draft-bars of each section of the frame project and are perforated for forming the joint heretofore described. By this construction all intermediate cross-bars except those at the end are dispensed with.

It is obvious that the outer draft-bars  $b$   $b$  in each section of the harrow-frame may be formed of sufficient length to enable the angle ends to be made at each end, so that the same may be perforated and the joint formed as before referred to, and the intermediate draft-bars rigidly held to the front and rear cross-bars  $c$   $c$ , as shown in Fig. 8. The projecting ends of cross-bars  $c$   $c$  are perforated at  $d$   $d$ , Figs. 9 and 10, for forming the hinge. The intermediate cross-bars  $b$  and  $b'$ , Fig. 8, are riveted to the cross-bars  $c$   $c$  at  $e$   $e$ , as shown in Fig. 8, thereby dispensing with the necessity of intermediate cross-bars. It is quite apparent that the same result may be attained by forming the cross-bars  $c$   $c$  of independent metal and riveting or bolting the same to the angle-iron draw-bars, although I do not consider this as entirely desirable, as the bolts and rivets are likely to wear or work loose.

I am aware that angle-iron in constructing harrow-frames is not new, broadly considered; but, so far as I am aware, the particular construction and combination of parts as herein shown and described are new.

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

An improved harrow-frame constructed of

angle or channel iron sections and composed  
of the parallel main bars connected at their  
ends only by transverse bars, in combination  
with the angle-bars connecting the main bars  
5 to the end bars, the inner ends of the inner  
bars being lapped and bolted together to form  
the hinges of the parts of the frame, substan-  
tially as described.

In witness whereof I have affixed my sig-  
nature in presence of two witnesses.

DE WANE B. SMITH.

Witnesses:

MILTON E. ROBINSON,  
EDWIN H. RISLEY.