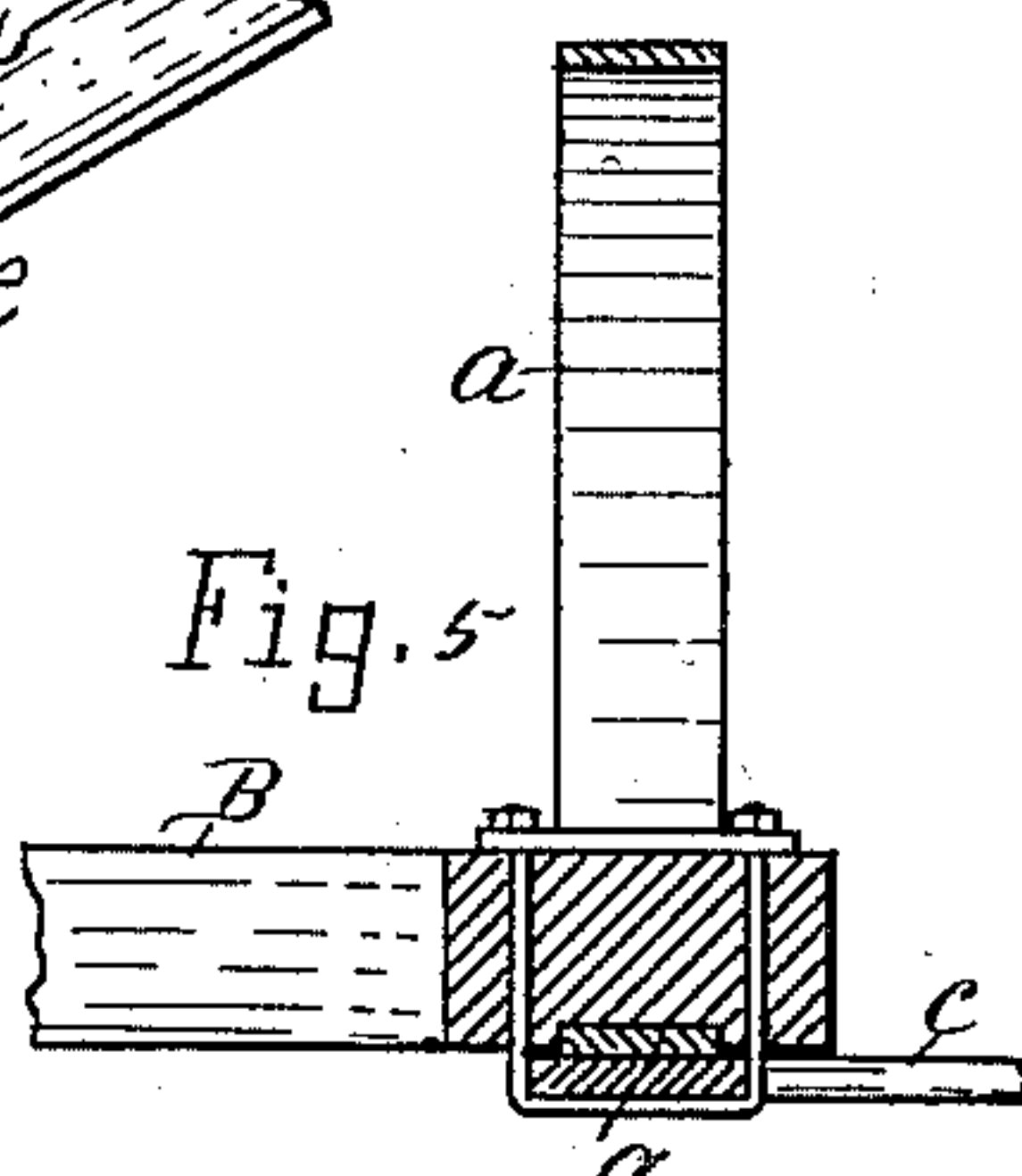
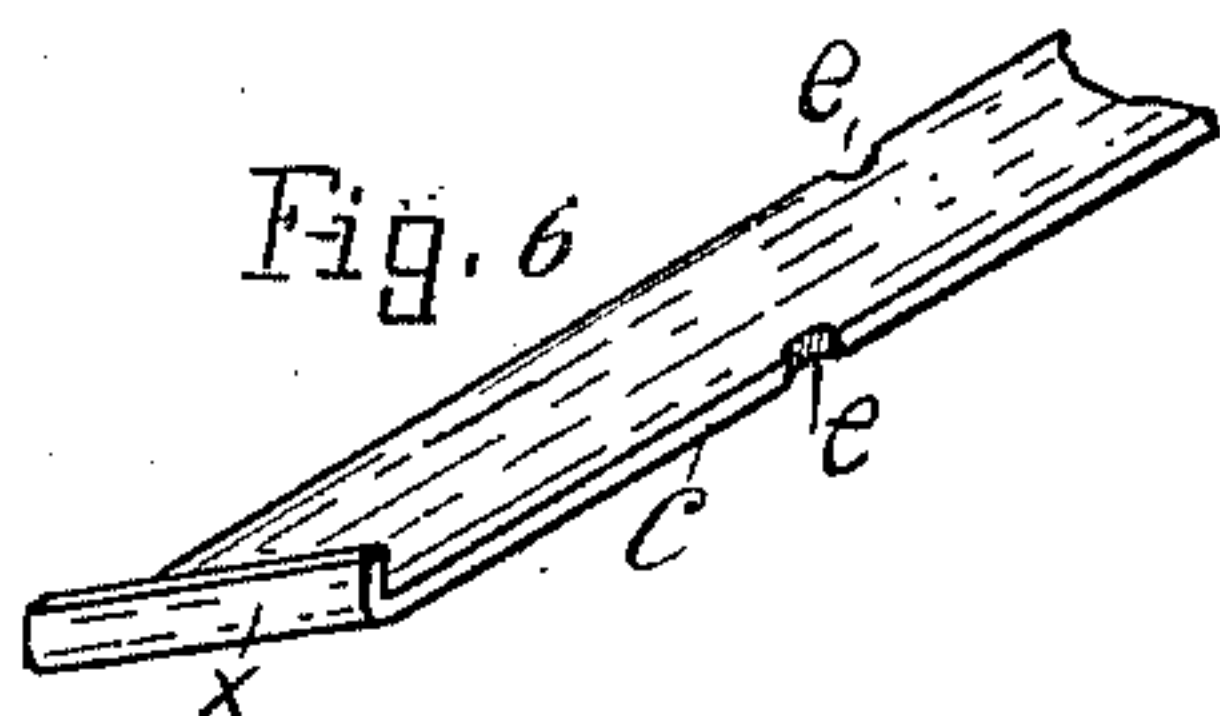
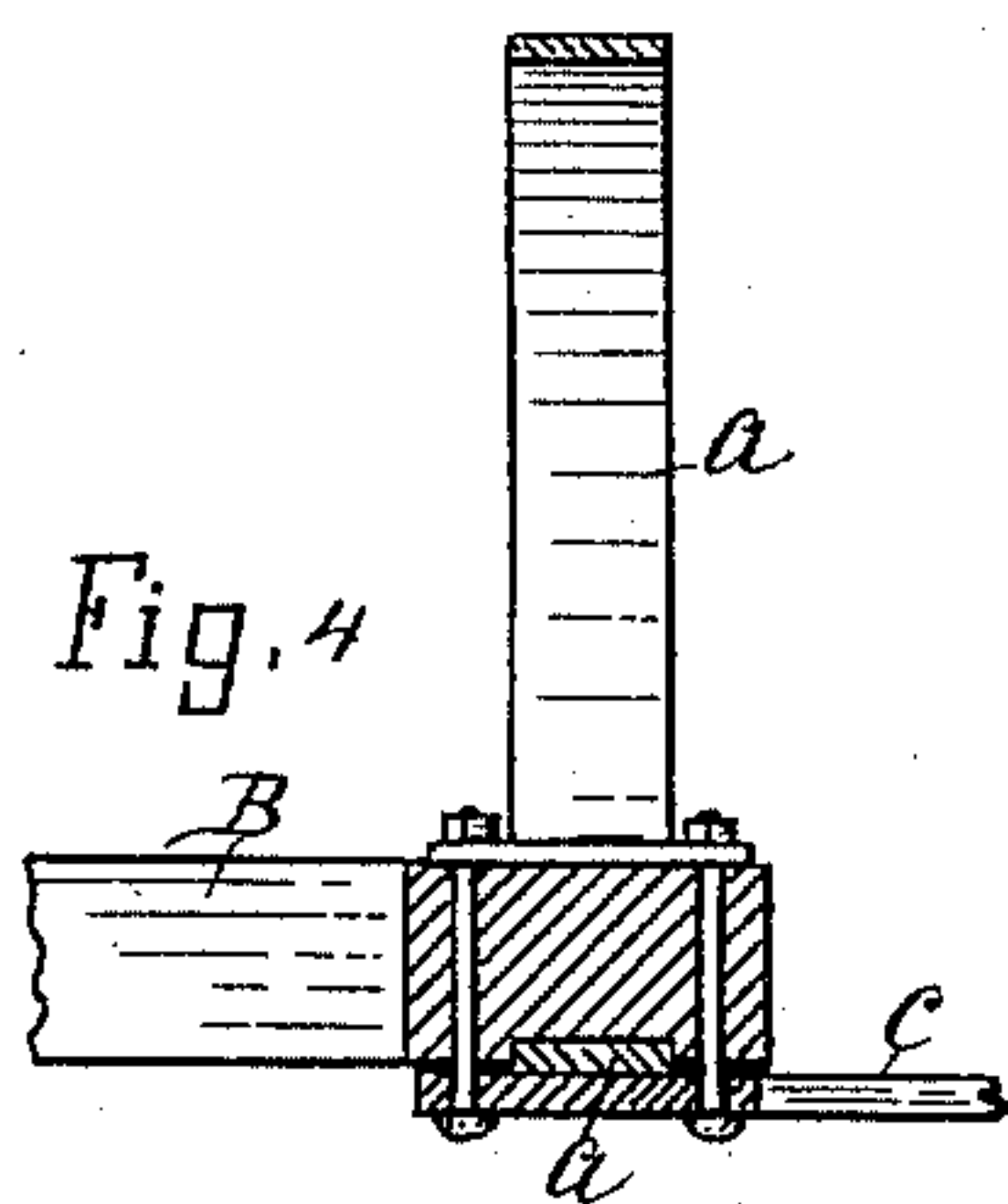
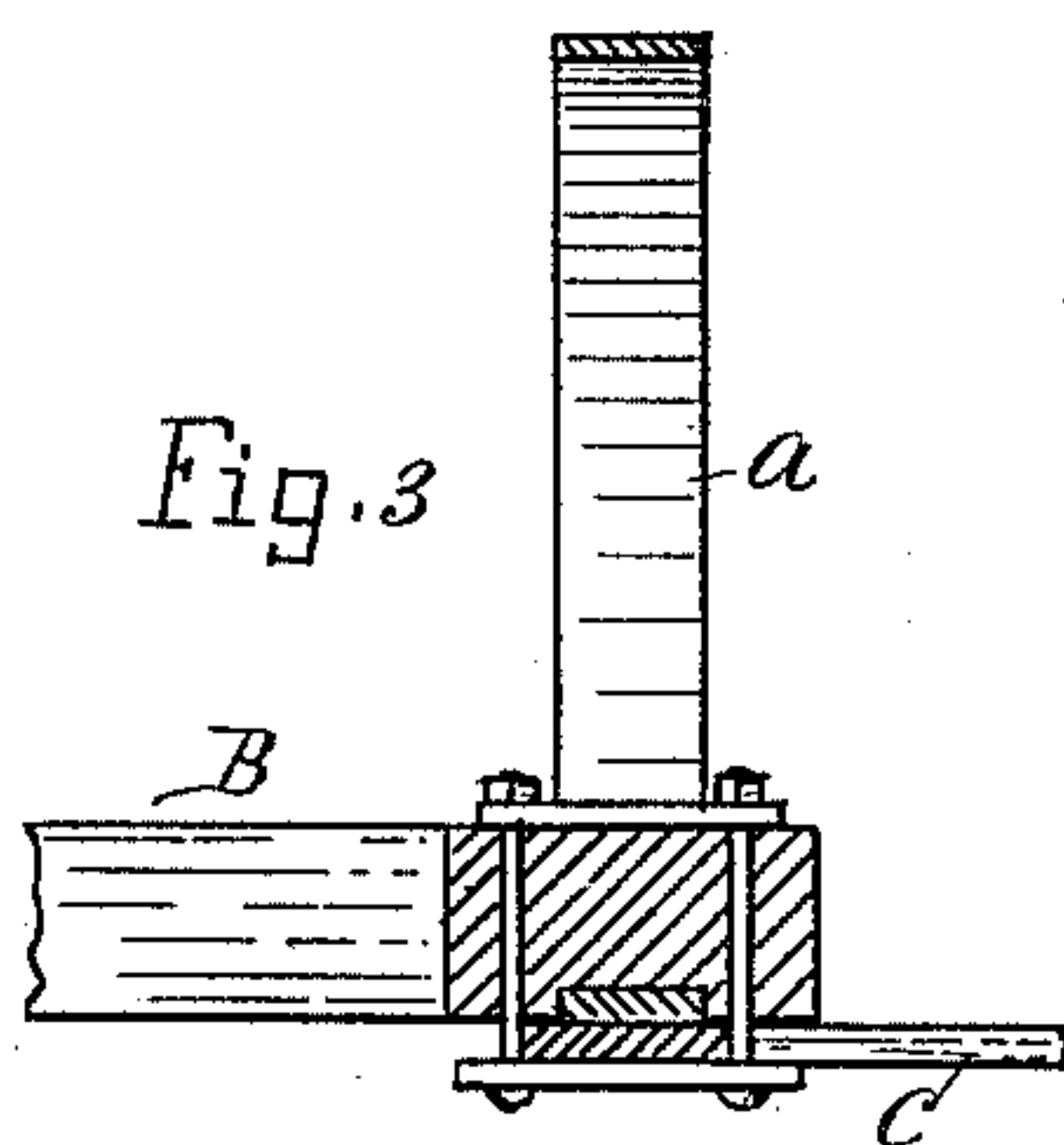
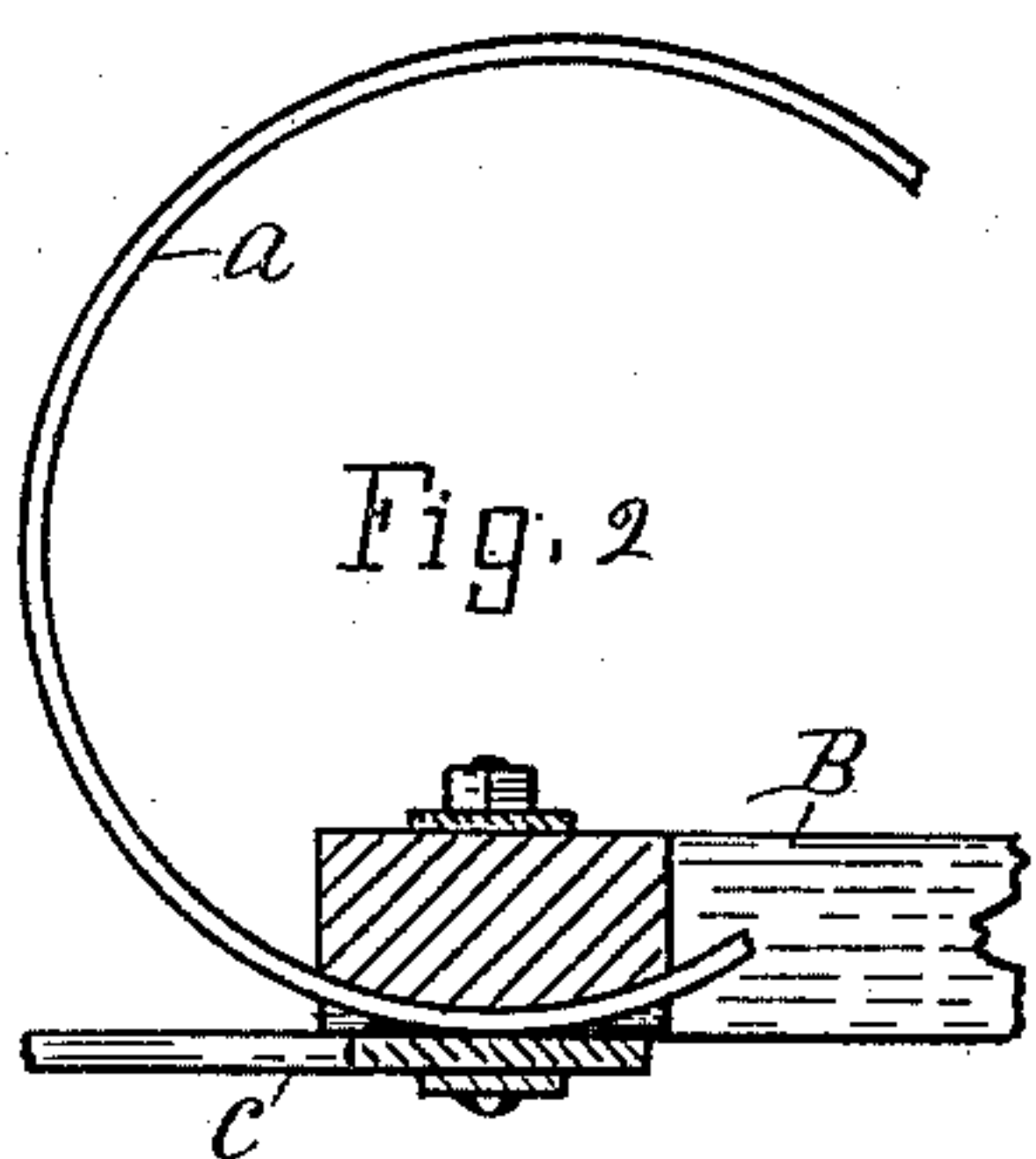
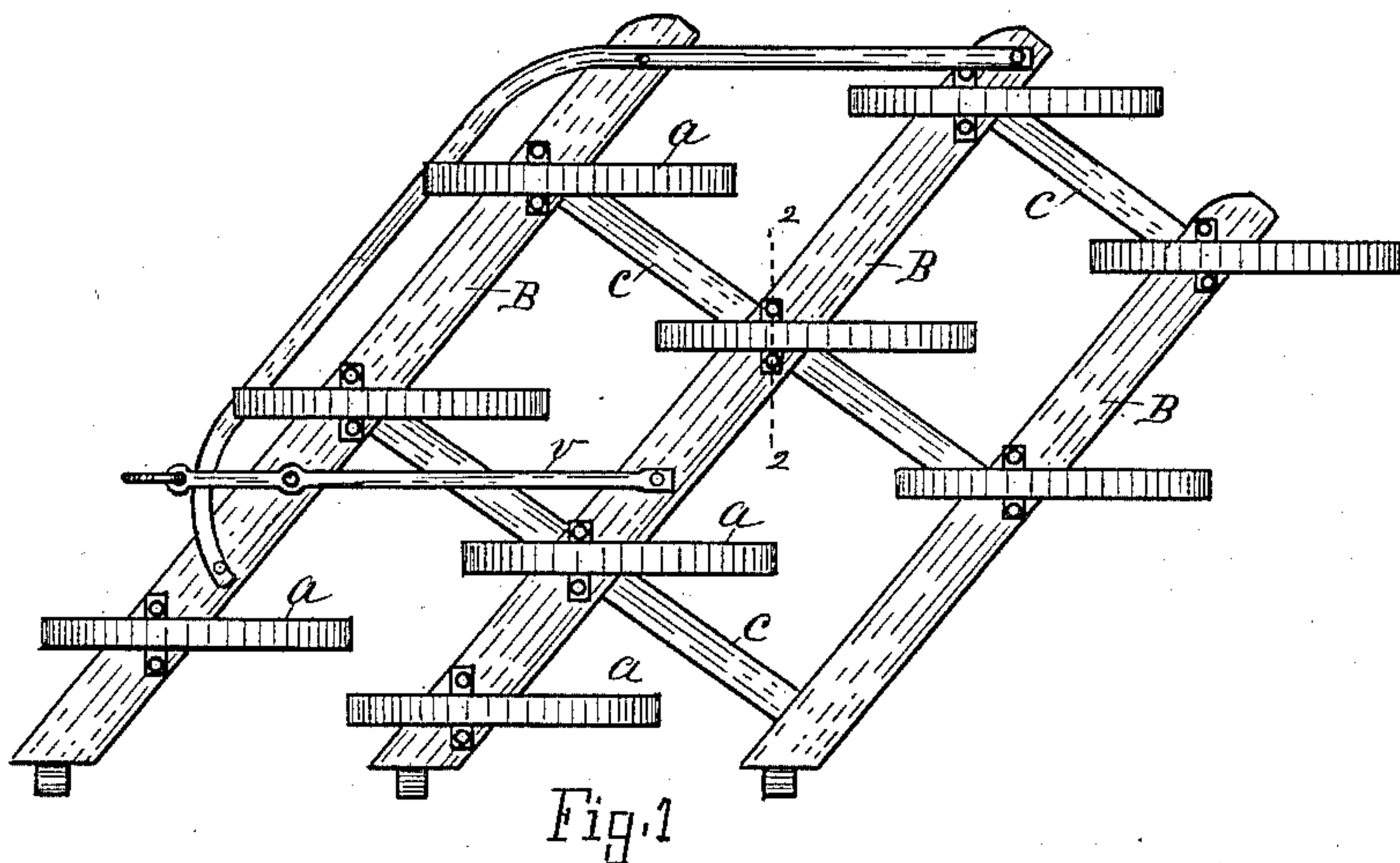


(No Model.)

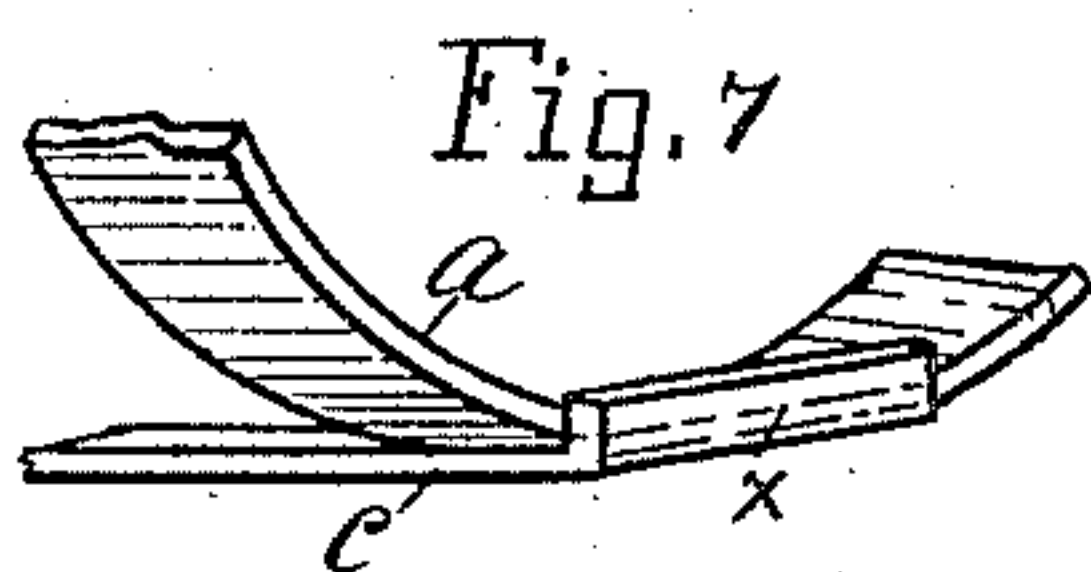
J. McMAHON.  
HARROW FRAME.

No. 396,944.

Patented Jan. 29, 1889.



Witnesses,  
John C. Perkins  
John H. Chase



Inventor,  
James M. Mahon  
By Lucius C. West  
att'y.

# UNITED STATES PATENT OFFICE.

JAMES McMAHON, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO D. C. & H. C. REED & CO., OF SAME PLACE.

## HARROW-FRAME.

SPECIFICATION forming part of Letters Patent No. 396,944, dated January 29, 1889.

Application filed February 14, 1888. Serial No. 263,996. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES McMAHON, a subject of the Queen of England, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Float Harrow-Frame, of which the following is a specification.

This invention has for its object to construct a float harrow-frame in which the bars which are transverse to the wooden draft-bars consist of thin metal strips bolted to the draft-bars on the under side. Other objects will appear in the description and claim.

In the drawings forming a part of this specification, Figure 1 is a plan of one-half of the harrow; Fig. 2, a section on a line with the edge of one of the curved harrow-teeth; Figs. 3, 4, and 5, sections on line 2 2 in Fig. 1, showing changes. Figs. 6 and 7 are broken details in perspective, enlarged, and below described.

Referring to the letters of reference marked on the drawings, B are the ordinary wooden (or metal) draft-bars. To these bars, on the under side, I attach the thin metal cross-bars *c*, and, if preferred, the harrow-teeth *a* may be clamped between the bars B *c*, as indicated in Figs. 2, 3, 4, and 5. The advantage of having the thin metal cross-bars *c* on the under side of the draft-bars instead of on top is that the draft is lessened, because the under beams are the ones that draw the dirt ahead of them when the harrow moves along, and by making the bars *c* of metal they will last longer, and, being thin, they will rather scale through the dirt than draw the same in front of them.

Among the advantages of having the cross-bars *c* thin metal and beneath the draft-bars B, instead of vice versa, may be named cheap-

ness, greater strength, and, the cross-bars being much the shortest, there is less frictional surface of the harrow-frame in contact with the soil, and for this additional reason the draft is lessened.

The cross-bars *c* may be attached to the draft-bars B by an upper and lower clip plate and bolts, Figs. 2 and 3, or by passing the bolts through the bar *c*, and thus dispensing with the lower clip, Fig. 4, or by employing the U-bolt, Fig. 5, or in any other suitable manner desired.

In Fig. 6 the broken portion of the bar *c* shows gains *e*, which receive the clamping-bolts and prevent the frame from twisting or drawing apart. The end of the bar *c* is turned up at *x*, this being the forward end or the upper left-hand end in Fig. 7. This prevents this end of the thin bars from catching against things. Fig. 7 also shows the end *x* and a broken part of a tooth, *a*.

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

A float harrow-frame consisting of the wooden draft-beams, the straight solid thin metal cross-bars on the under side of the draft-beams, said cross-bars having the side gains and the upwardly-turned ends projecting beyond the draft-beams at the forward ends, and the clamping-bolts in the gains of said cross-bars, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in presence of two witnesses.

JAMES McMAHON.

Witnesses:

MOSES HILL,  
ASA CLARK.