

(No Model.)

3 Sheets—Sheet 1.

DE WITT C. MARKHAM.
SPRING TOOTH HARROW.

No. 442,067.

Patented Dec. 2, 1890.

Fig. 1.

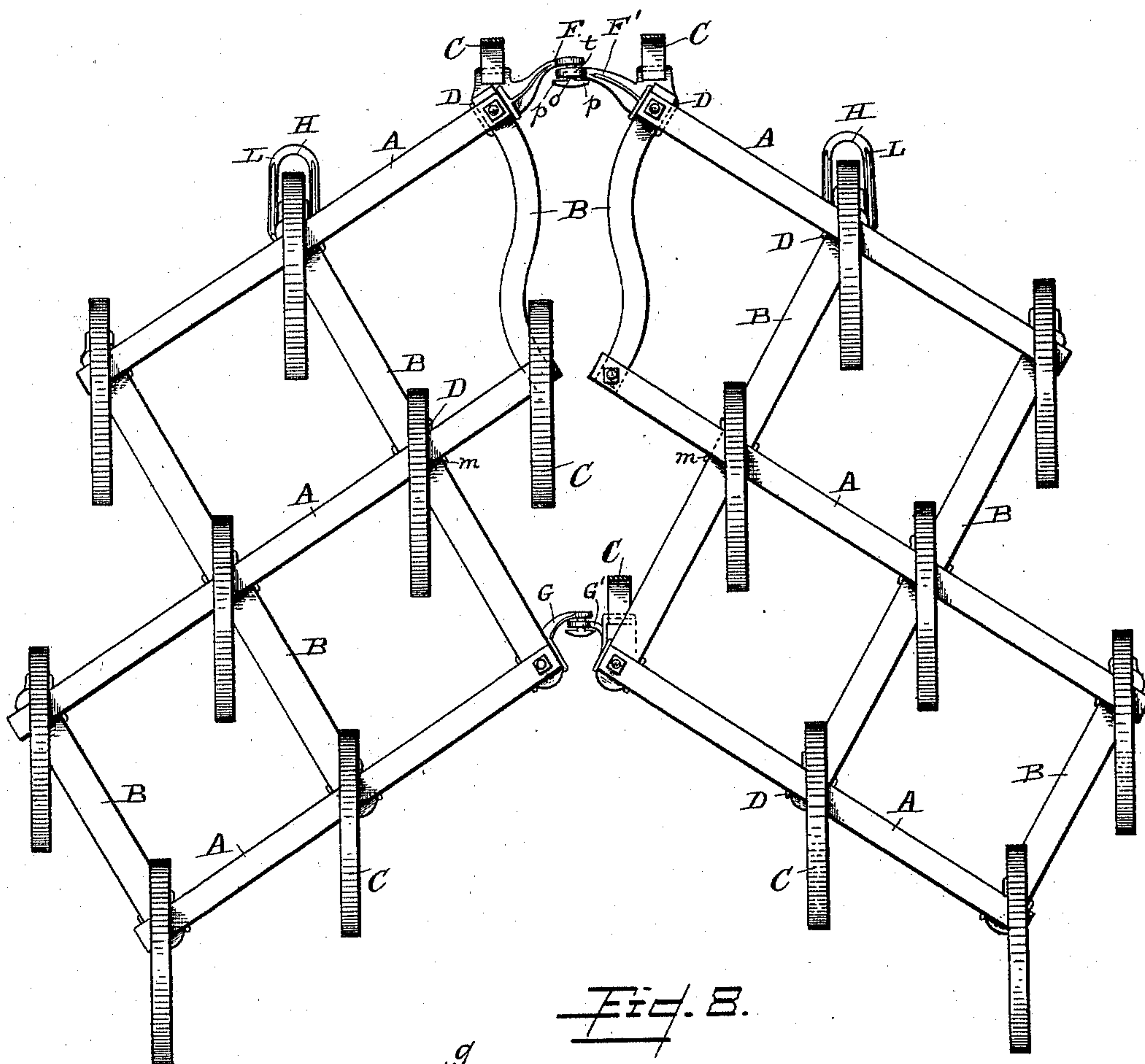
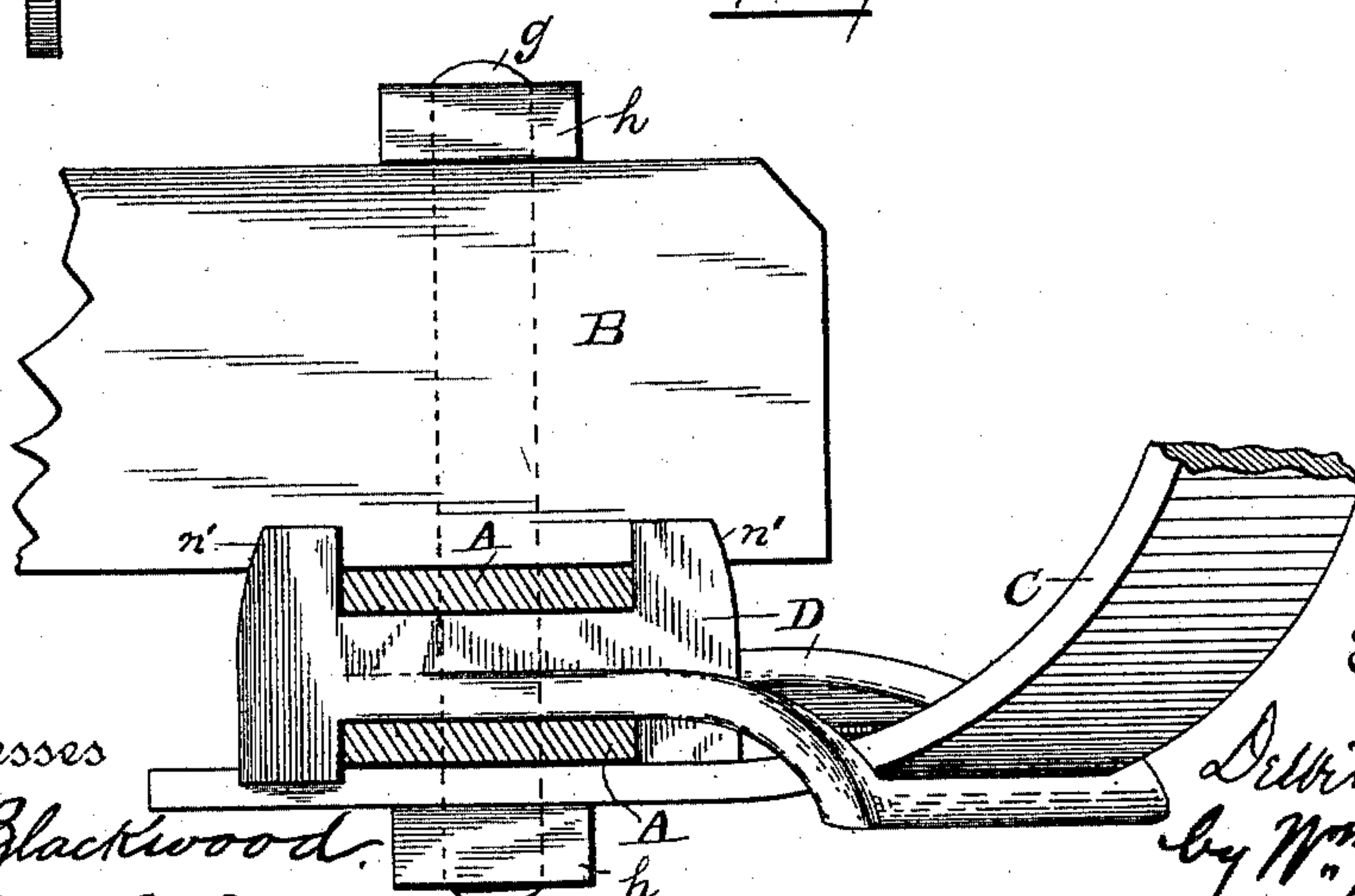


Fig. 2.



Witnesses
Josh Blackwood
Albert A. Blackwood

Inventor
De Witt C. Markham
by *Wm. H. Root*
Attorney

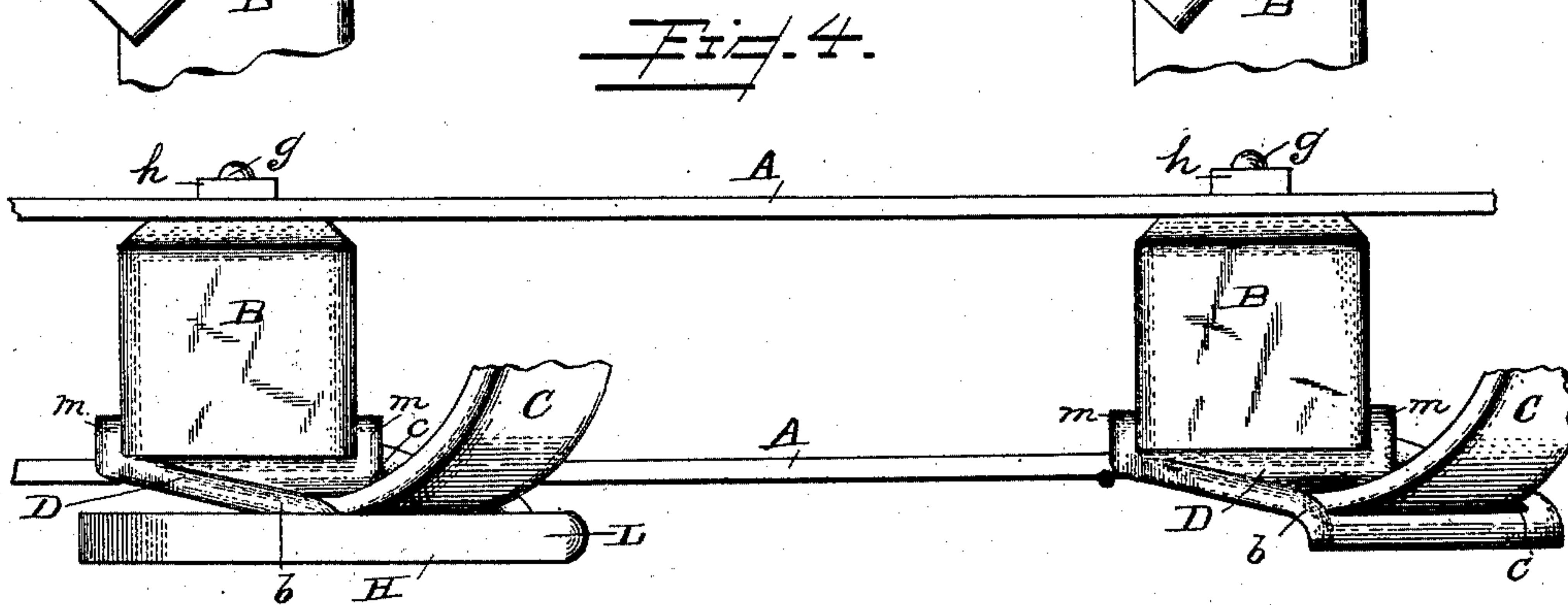
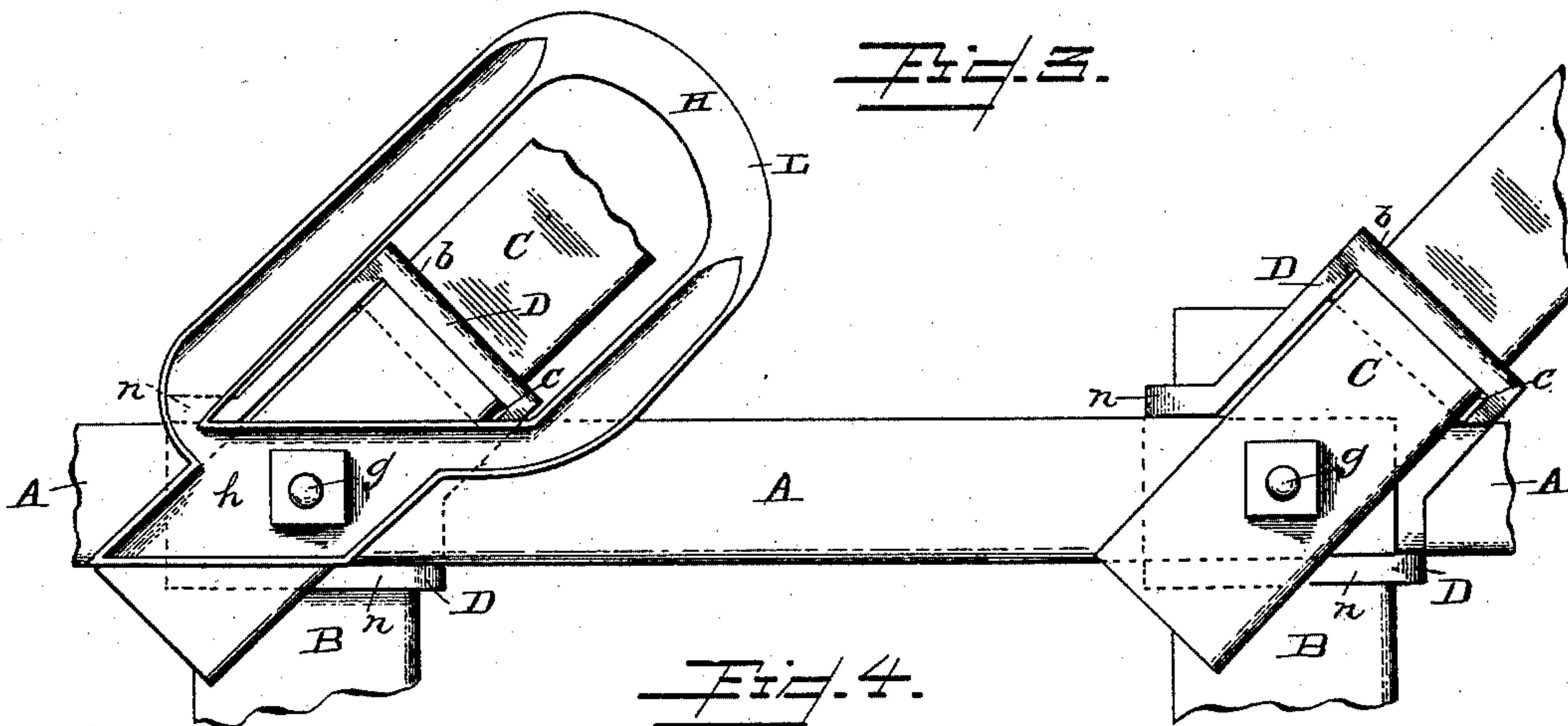
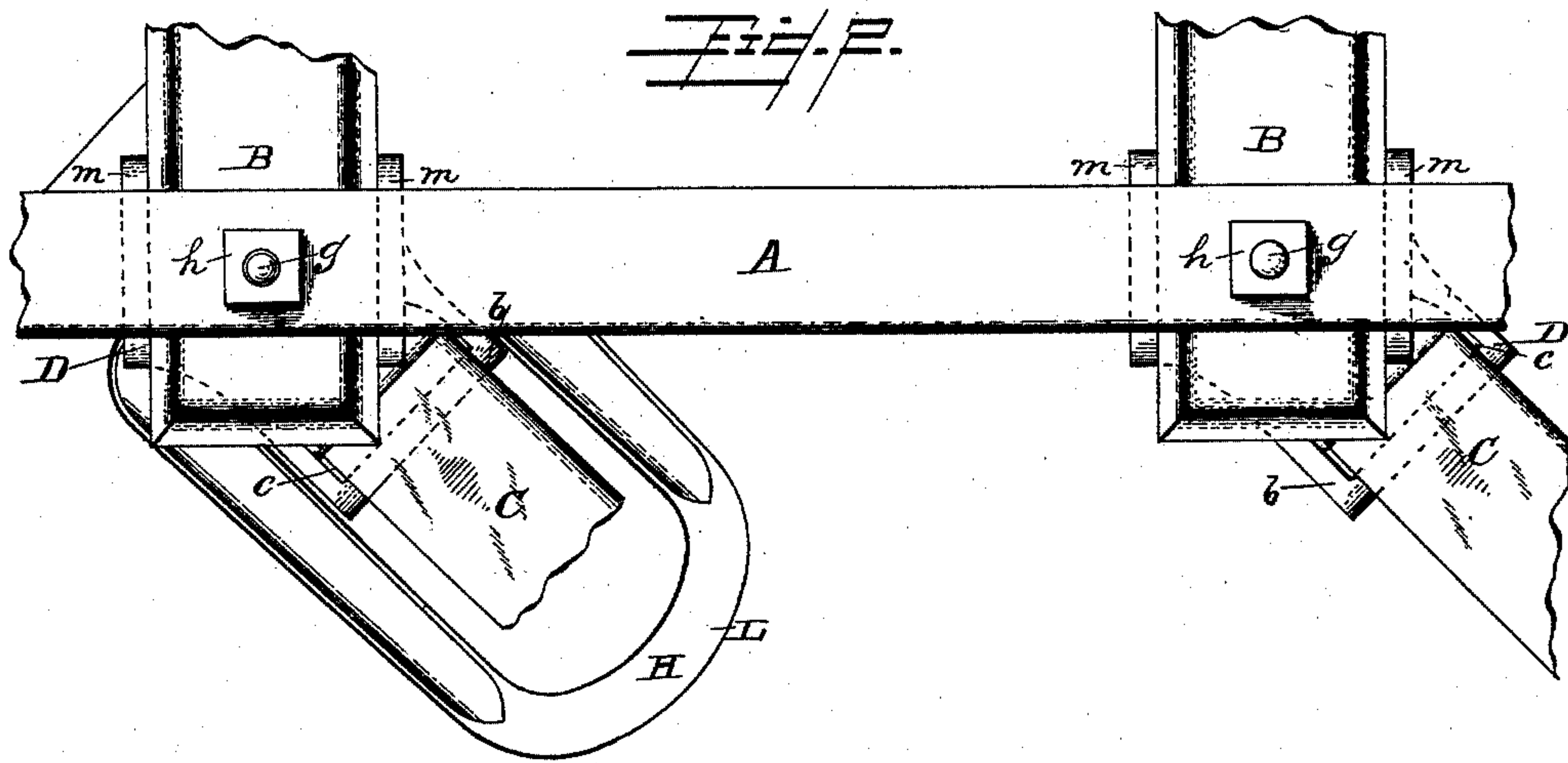
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DE WITT C. MARKHAM.
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Patented Dec. 2, 1890.



Witnesses

Just Blackwood
Albert B. Blackwood

Inventor
Dewitt C. Markham
by Wm. H. Doolittle
Attorney

(No Model.)

3 Sheets—Sheet 3.

DE WITT C. MARKHAM.
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Fig. 5.

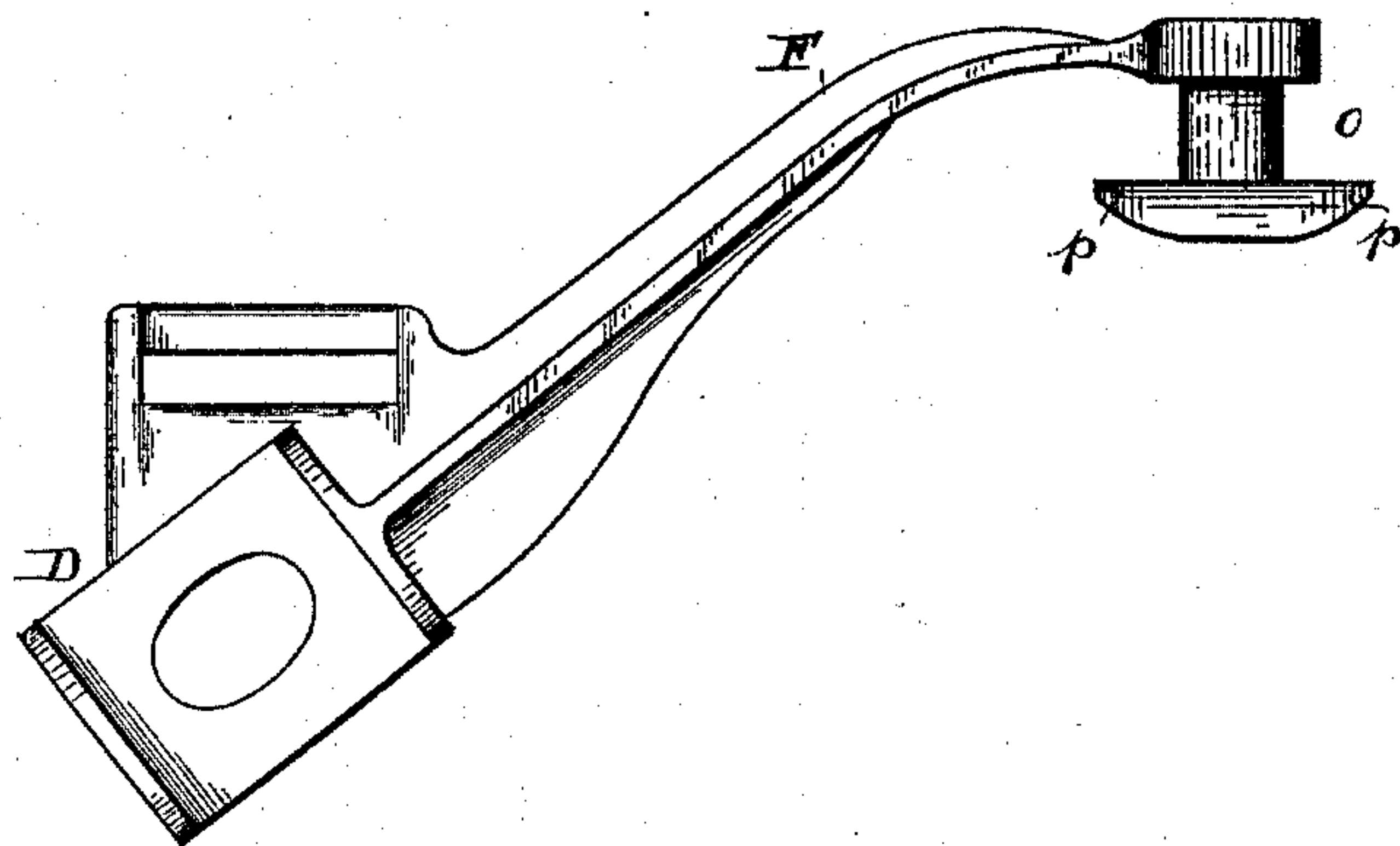


Fig. 6.

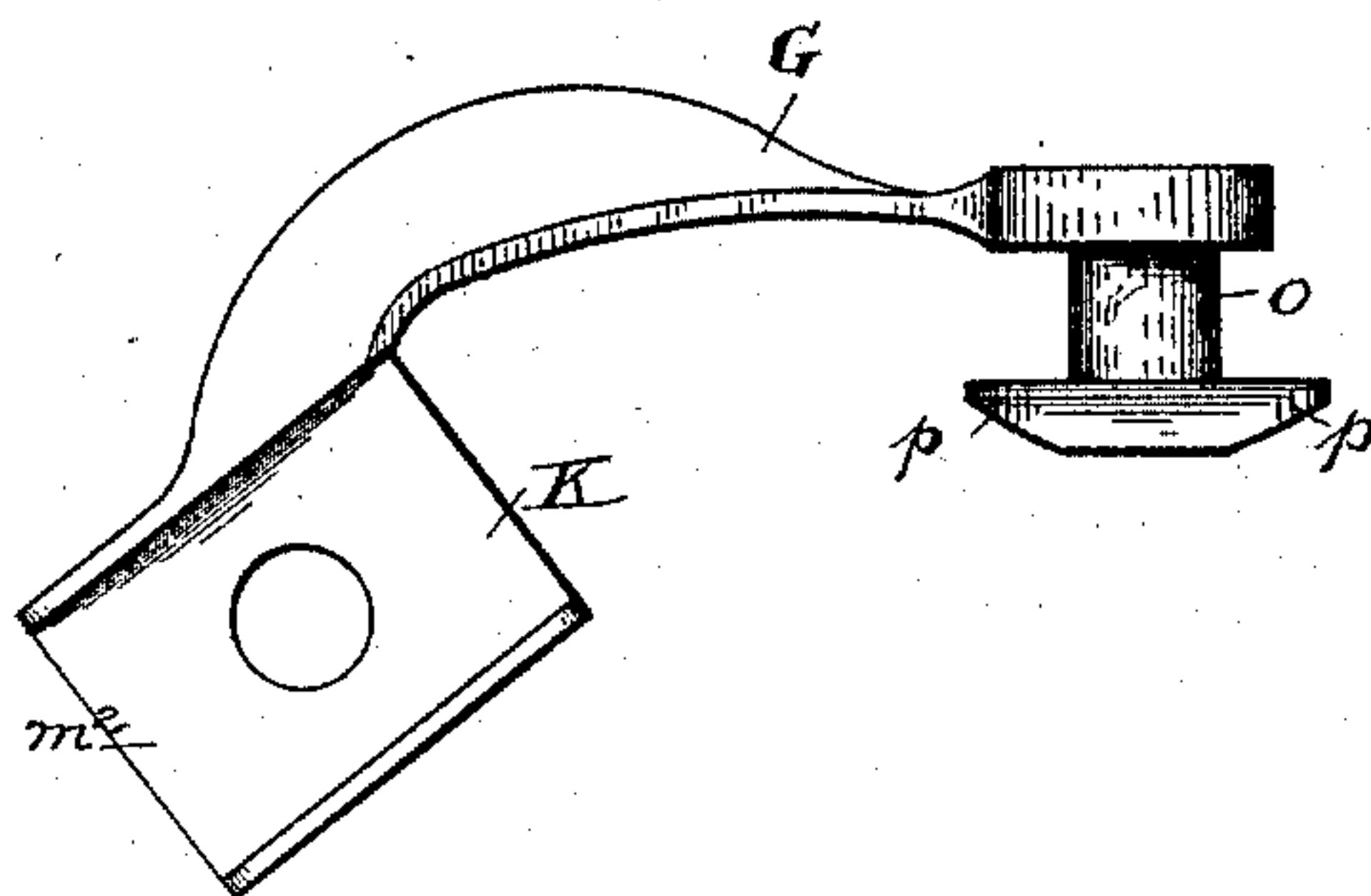
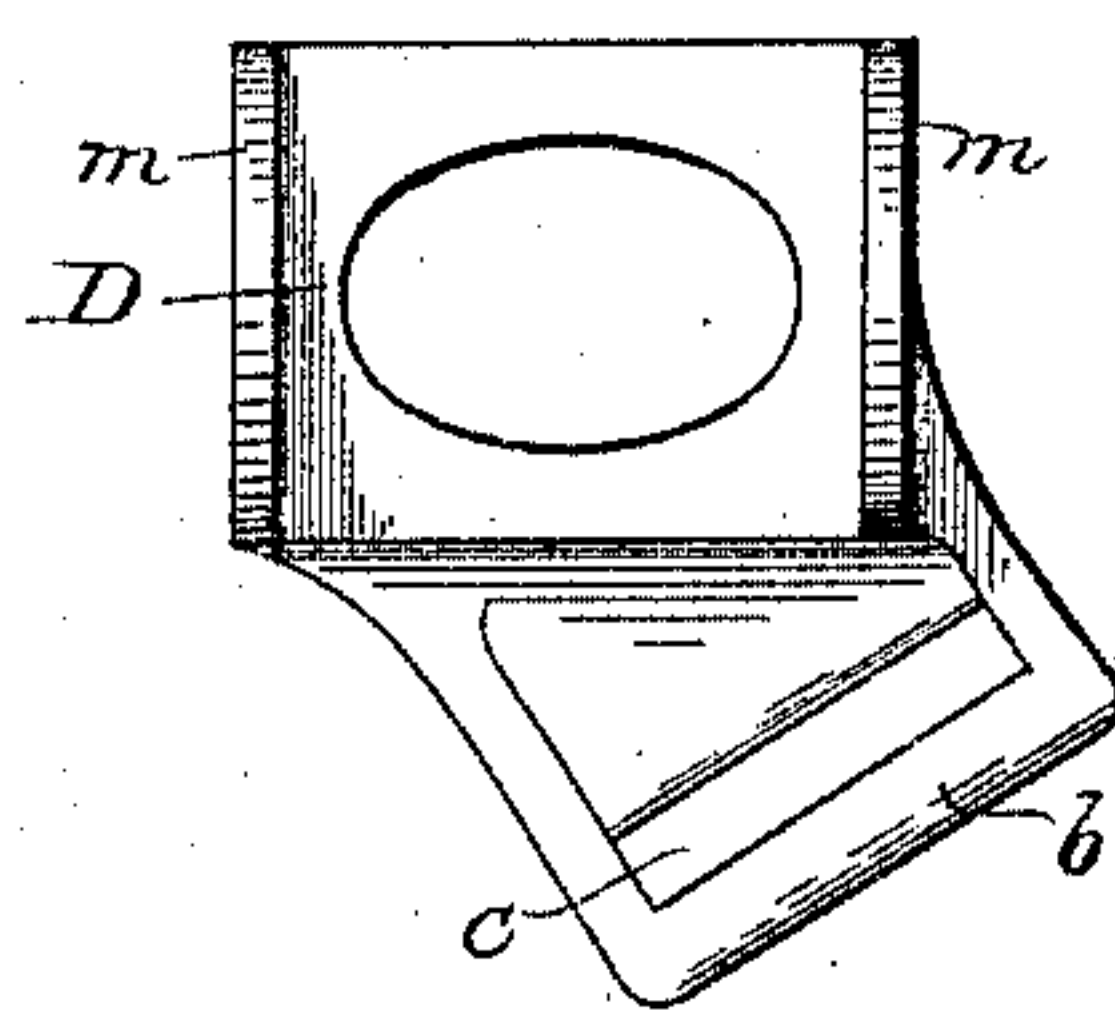


Fig. 7.



Witnesses

Josh Blackwood,
Albert B. Blackwood

Inventor

De Witt C. Markham
by Wm. H. Doolittle
Attorney

UNITED STATES PATENT OFFICE.

DE WITT C. MARKHAM, OF COLLINSVILLE, NEW YORK.

SPRING-TOOTH HARROW.

SPECIFICATION forming part of Letters Patent No. 442,067, dated December 2, 1890.

Application filed February 17, 1890. Serial No. 340,680. (No model.)

To all whom it may concern:

Be it known that I, DE WITT C. MARKHAM, a citizen of the United States, residing at Collinsville, in the county of Lewis and State of New York, have invented certain new and useful Improvements in Spring-Tooth Harrows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in what are known as "spring-tooth harrows," and has for its objects the construction of a stronger frame, more secure and rigid fastening for the tooth to the harrow-frame, and of more simple and efficient means for hinging the sections of the frame together, and wherein the use of angle-bars, a curved seat on the frame, a clip for fastening the parts together, and washers and spring-keys in hinges are dispensed with; and it consists of such features and combinations of features, as hereinafter more particularly described and claimed.

In the accompanying drawings, which illustrate my invention, Figure 1 is a plan of a spring-tooth folding harrow with my improvements applied; Figs. 2, 3, and 4, enlarged details showing draft-iron, saddle, and their connections; Figs. 5 and 6, details of front and rear hinges; Fig. 7, a detail of the saddle; and Fig. 8 a detail of a modification.

The frame is preferably made of thin flat steel draft-bars and wooden cross-beams, and the draft-bars may be placed top and bottom of the cross-beams or on the under side thereof, as hereinafter described.

A A represent the draft-bars, employed in pairs, and, as shown in Figs. 1, 4, and 8, one passed above and the other beneath the cross-beams.

B B are the cross-beams, preferably constructed of oak or other hard wood, but may be of metal.

D are saddles placed at the intersection of the draft-bars and cross-beams, and on the underside of said cross-beams, said saddles being provided with channels on their upper and lower faces to form snug seats for the draft-bars and cross-beams by means of the upwardly-projecting lugs *m m* and the down-

wardly-projecting lugs *n n*. Said saddle is further provided with an extension *b*, in which is a transverse slot *c*, the extension and slot forming a loop through which passes and in which bears the shank of the spring-tooth C. This arrangement secures to the spring-tooth a much better fastening than in the case of ordinary spring-tooth harrows, wherein the tooth is secured only by a bolt passing through the cross-beams and draft-bars.

C is a section of a spring-tooth. The tooth C is fastened by a bolt *g*, which passes through the tooth, saddle, draft-bars, and cross-beam, securing these parts snugly and firmly together by the nut *h*. No clip of any kind is employed in this combination. The shank of the tooth is made flat where it is attached to the frame, and as it has an additional bearing in the loop in the extension *b*, as aforesaid, the strain on the bolt is greatly relieved.

In the modification shown in Fig. 8 the draft-bars are placed beneath the cross-beam, the upper draft-bar being placed next to the cross-beam and in the channel of a saddle, and the lower draft-bar placed on the shank of the tooth end in the under channel of the saddle. The upper lugs *n' n'* of the saddle hold against both the upper draft-bar and cross-beam. In both forms the draft-bars are held apart, but are directly over each other and run in the same direction, and in both cases a single screw-bolt and nut may be used to hold all the parts solidly together.

The harrow is made in two sections connected by front and rear hinges. F is one part of the front hinge and F' the other part. The part F is provided with a stud *o*, having lugs *p*, making a T-head, and the part F' is provided with a loop *t*, adapted to hook over the stud *o*. By this mode of locking the use of washers and spring-keys is avoided. Both parts of the front hinges are in one piece with the saddle D.

The rear hinge parts G G' are respectively constructed like the front hinge with stud and lugs on one part and a locking-loop on the other; but their shanks are not provided with a loop-seat, but terminate in a square seat K, having a shallow channel *m*, in which rests the flat shank of the tooth.

H H are the draft-irons, comprising a head

K, having therein a seat for the reception of the shank of the tooth, and a loop L projecting therefrom. The draft-iron is attached by the bolt *g* at proper points on the frame, the draft-iron, tooth, lower draft-bars, saddle, cross-beam, and upper draft-bar being all securely held together in the order named by the bolt *g* and nut *h*.

Having thus described my invention, what I claim is—

1. In a harrow, the combination, with a spring-tooth, of flat draft-bars, cross-beams between said bars, and a saddle between said cross-beam and bottom draft-bar, said saddle having a loop for the shank of the tooth to pass through, substantially as described.

2. The combination, with top and bottom draft-bars, of a cross-beam between said bars, and a saddle resting on the bottom draft-bar and provided with vertical walls which embrace the sides of the cross-beam and the bottom draft-bar, substantially as described.

3. The combination, with top and bottom draft-bars, of cross-beams between said bars, a saddle resting on the bottom draft-bar and provided with vertical walls which embrace the sides of the cross-beam and bottom draft-bar, and the draft-iron H, all held together by a bolt and nut, substantially as described.

4. In a harrow-frame, the draft-bars A, employed in pairs, in combination with the cross-beams B, and the saddle D, one of said draft-

bars passed above and the other beneath the cross-beams and one directly above the other and running in the same direction, the said saddle placed between and at the intersection of the draft-bars and cross-beams, and a bolt to hold the said parts together, substantially as described.

5. In combination with a curved spring-tooth, the draft-bars, cross-beams, and saddle, the saddle placed between and at the intersection of the draft-bars and cross-beams and on the under side of a cross-beam, said saddle provided with channels in its upper and lower faces to form seats for the draft-bars and cross-beams, and also provided with an extension and slot to form a loop and bearing for the shank of said tooth, substantially as described.

6. In combination with the draft-bars and the cross-beams placed between said draft-bars, hinges provided with flanges to fit the draft-bars, one part of the hinge also provided with a stud and lugs and the other part with a loop or slot, and bolts to hold the said parts together, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DE WITT C. MARKHAM.

Witnesses:

O. E. DAVIS,
E. F. RYAN.