

H. LOW.
Shearing Metals.

No. 47,967.

Patented May 30, 1865.

Fig. 1.

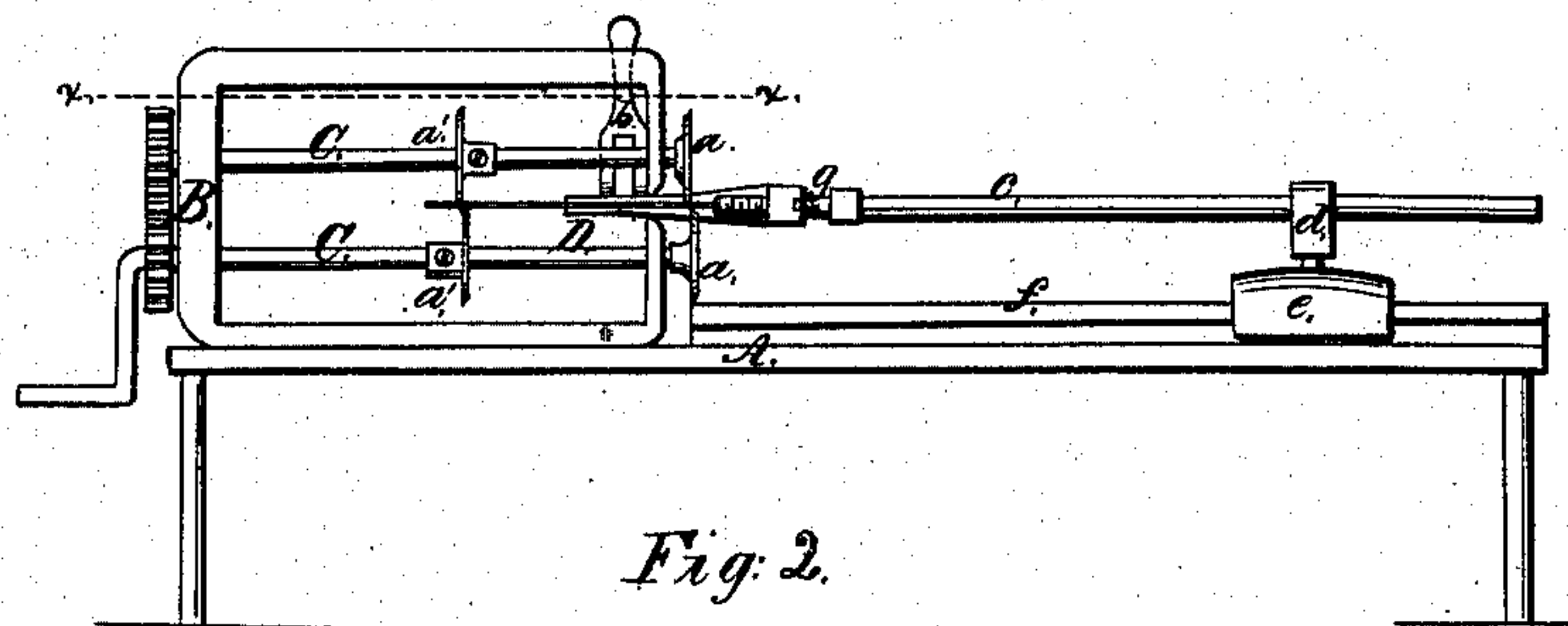


Fig. 2.

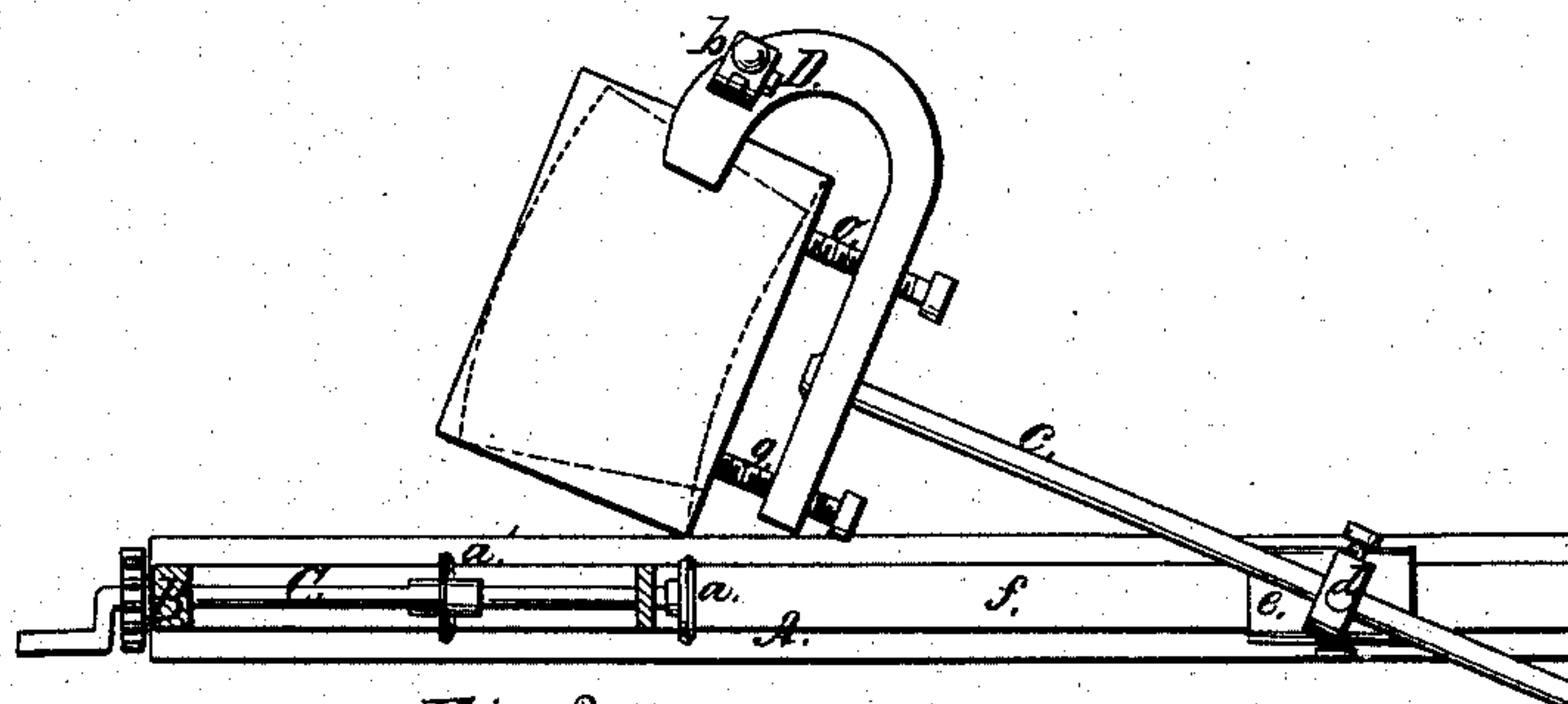


Fig. 3.

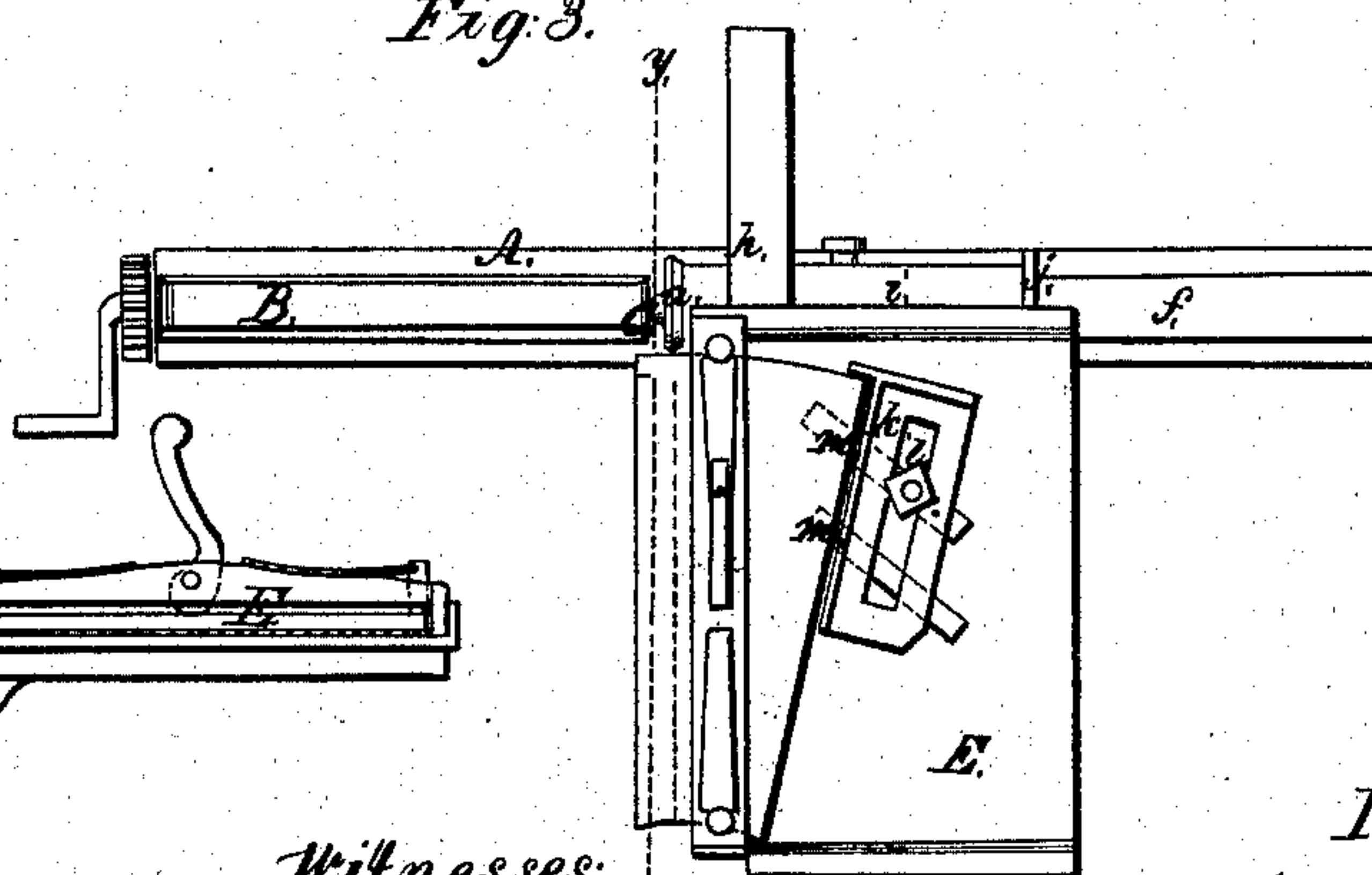
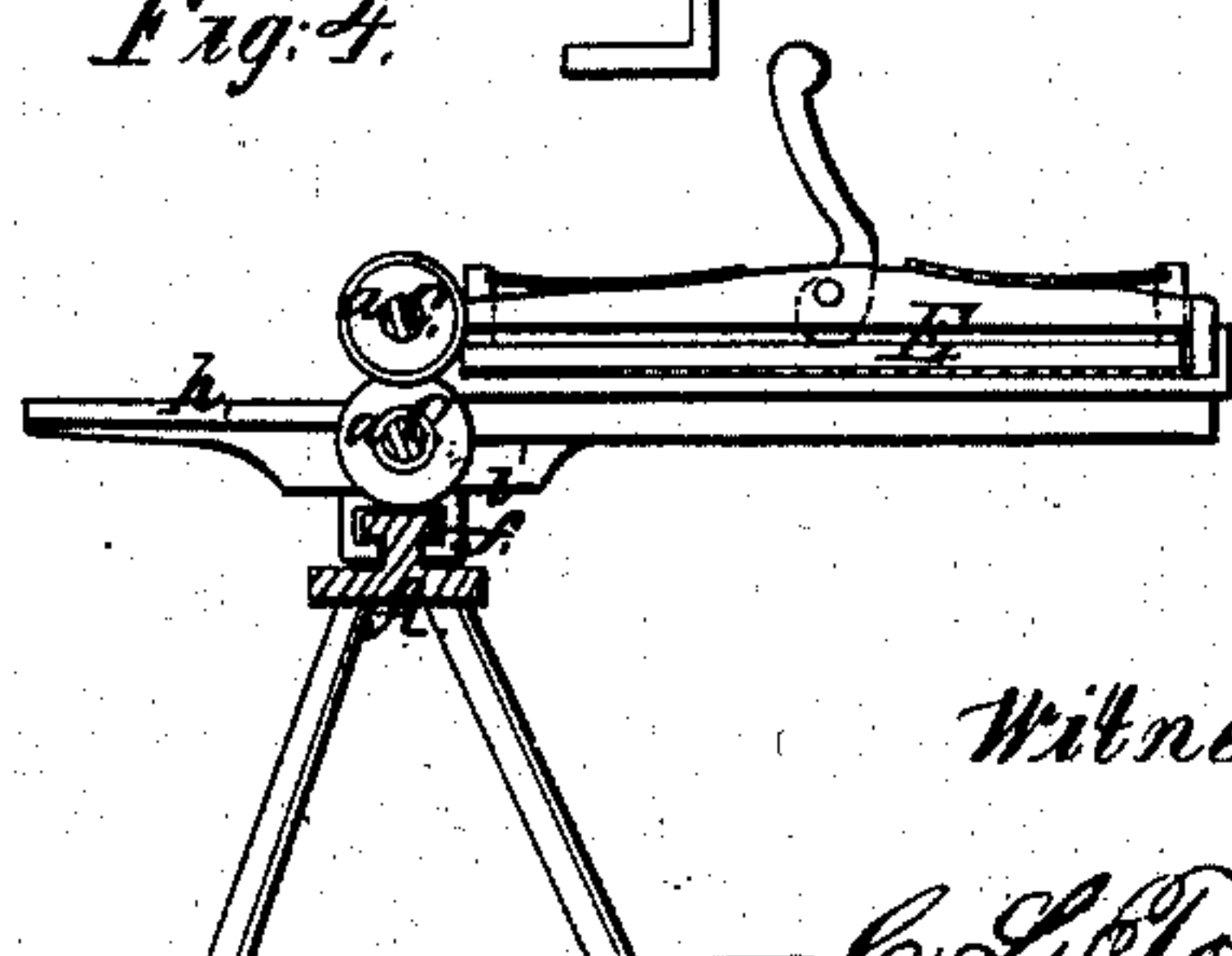


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

HOSEA LOW, OF WAUKON, IOWA.

MACHINE FOR CUTTING SHEET METAL.

Specification forming part of Letters Patent No. 47,967, dated May 30, 1865.

To all whom it may concern:

Be it known that I, HOSEA LOW, of Waukon, in the county of Allamakee and State of Iowa, have invented a new and Improved Machine for Cutting Sheet Metal; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of this invention when arranged for cutting simultaneously two segments of concentric circles. Fig. 2 is a sectional plan or top view of the same, the plane of section being indicated by the line *x x*, Fig. 1. Fig. 3 is a plan or top view of the same when used with the squaring-frame. Fig. 4 is a transverse vertical section of the same, taken in the plane indicated by the line *y y*, Fig. 3.

Similar letters of reference indicate like parts.

This invention consists in the employment or use of a stationary frame with two pairs of cutters, or of two frames each with one pair of cutters, in combination with a clamp made in such a shape that the part which clamps the sheet metal passes by one pair of cutters, and the other part holds the gages, and that by the use of such cutters and clamp flaring work of any desirable form and shape can be cut with the greatest ease and accuracy. The clamp is secured to a rod which is adjustable in a swivel inserted in a slide in such a manner that the sheet to be cut can be easily adjusted to the desired position, and two segments of two concentric circles of any desired diameter can be cut out simultaneously and by one and the same operation. The ends of the sheet are cut to the desired bevel by means of a squaring-frame provided with a gage which can be adjusted to suit the length and the bevel to be cut. Said squaring-frame is made movable on a transverse strip fitted to the bed-strip, and it is supported at or near its rear end by a flange which takes the place of a second guide-strip.

A represents the bed-strip of my machine, which is made of iron or any other suitable material, and which may be supported by legs or in any other desirable manner. From one end of this bed-strip rises the stationary frame B, which forms the bearings for the arbors

C, on which the cutters *a a'* are mounted. The cutters *a* are rigidly attached to the inner ends of the arbors C, and the cutters *a'* are adjustable on said arbors, so as to increase or decrease their distance from the cutters *a*, according to the size of the sheet of metal to be cut. The frame B may be continued over the center and connect to the other end of the bed-piece, making an oblong square. The inner end of the frame B may be open, as clearly shown in Fig. 1, and the two arbors are geared together, so as to cause them to revolve in opposite directions with a uniform speed, motion being imparted to the same by hand or any other competent power.

The sheet metal to be cut is secured in the clamp D, which is operated by the knuckle *b*. This clamp is secured to the inner end of a bar, *c*, that is adjustable in a longitudinal direction in a swivel-socket, *d*, so that the diameter of the circle described by the clamp can be increased or decreased to suit different bevels. The swivel-socket *d* is secured in a slide, *e*, which is adjustable toward and from the frame B on a flanged or T-shaped rail, *f*, attached to or made solid with the bed-strip A.

The clamp D is made in such a shape that the part which clamps the sheet metal passes by one pair of cutters, and the other part holds the gages *g*, represented by screws or any other suitable means. Instead of making the clamp with one pair of clamping-jaws only, it might be made with two pairs—one pair to pass around the cutters *a* one way and the other pair around the other way, making a clamp to hold each end of the sheet metal; or the ends of the two pairs of jaws may be made to meet, making a slot, into which the sheet metal may be clamped.

The gages, instead of being made of screws, may be made of sliding pieces fastened with set-screws, and may have a small notch in the end to place the sheet metal in, and there may be different holes in the head-piece of the clamp, so as to set the gages at different distances apart.

Instead of having the cutters *a'* arranged on the same arbors with the cutters *a*, they might be mounted on the ends of separate arbors having their bearings in a distinct frame, similar to the frame B, and having its open end pointing in the same or in opposite directions. In both cases the secondary frame would have to

be made adjustable, and the clamp would pass around the cutters *a* or *a'*. If desired, the cutters might be placed in such relation to each other and to the clamp that the two pairs of cutters come in operation one after the other; but in most cases it will be preferable to have the same arranged as shown in the drawings, so that both pairs of cutters act simultaneously, and the desired annular segment is obtained by one motion of the clamp. The common center of the two segments of circles cut out by the two pairs of cutters is determined by the position of the slide *e*, which carries a swivel-socket, *d*. By moving said slide back and forth, and adjusting the bar *c* accordingly, the radii of the segments can be regulated to suit the desired bevel.

In order to cut off the ends of the annular segments to the requisite bevel, said segments are secured in the squaring-frame E, which takes the place of the clamp D. (See Figs. 3 and 4.) This squaring-frame is fitted to a guide-strip, *h*, which extends transversely across the bed-strip A, being secured to a slide, *i*, which is adjustable on said bed-strip toward and from the cutter-frame B. A small flange, *j*, rising from the outer end of the slide *i*, supports the squaring-frame and keeps the same level. Said squaring-frame is provided with a gage, *k*, for cutting the bevels. It is movable in the desired direction by means of the slot *l* in the gage, in combination with two oblique slots, *m*, in the squaring-frame. By means of these slots the gage can be readily adjusted so as to give the desired bevel or the requisite length. The design is that the outside curve on the annular segments may rest one end against the shoulder or projection forward and the other against the corner of the frame under the clamp. (See Fig. 3.) In commencing to cut off the ends the surplus metal on one end would lie upon the top of the gage and the other end against the corner of the frame under the clamp and reaching through, so that the cutters *a* will cut off the end in pushing the frame forward. The piece of sheet metal is then changed and the other end put under the clamp, while the end cut off will go down in front of the gage, and the corner previously cut be brought into the corner made by the shoulder of the gage and its front. Thus the length of the piece will be cut as indicated by the front of the gage, and the bevel will be alike, as the outside circle rests against the same points while cutting both ends. This gage may also be constructed and used so that other bear-

ings may be used for one end than the corner of the frame under the clamp. The bearing for the end which goes under the clamp may be something movable, and put on any place on the frame near the clamp, or may be used against the inside curve as well as the outside, and the same in regard to the top and front projections at one end of the gage. They may be used on either side of the piece. The gage could also be made of two pieces with the ends hinged together, one part making a bearing for the end to give the length, and the other a bearing for one of the curves or sides. A single pin might indicate the length of the piece to be cut, and two more the bearings for one side, leaving the gage substantially the same as shown in the drawings.

By using a circular clamp secured in the slide *e*, or otherwise made adjustable on the bed-strip toward and from the cutters *a*, the machine may also be used for circular cutting.

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

1. The employment or use for this purpose of any single stationary frame, or of two frames with the open ends pointed in the same direction (in either case) with two pairs of cutters, whether the frame or frames or the cutters be adjustable toward the working center or the center adjustable toward the cutters, and especially if the cutters are so placed in relation to the center (or swivel) that a right line drawn through the cutting-points of contact between the cutters will pass through the working center in any position of adjustment, substantially as herein set forth.

2. The clamp D and radius-bar *c*, constructed in such a manner as to lengthen and shorten at the center, and the part that clamps the tin so formed as to pass by one pair of cutters or between two pairs of cutters, in combination with any stationary frame or frames with one or two pairs of cutters, and with or without the gages, substantially as and for the purpose described.

3. The gage *k*, provided with a longitudinal slot, *l*, in combination with two oblique slots, *m*, in the squaring-frame E, constructed and operating substantially as and for the purpose specified.

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Witnesses:

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