

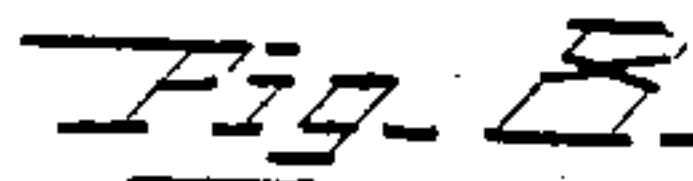
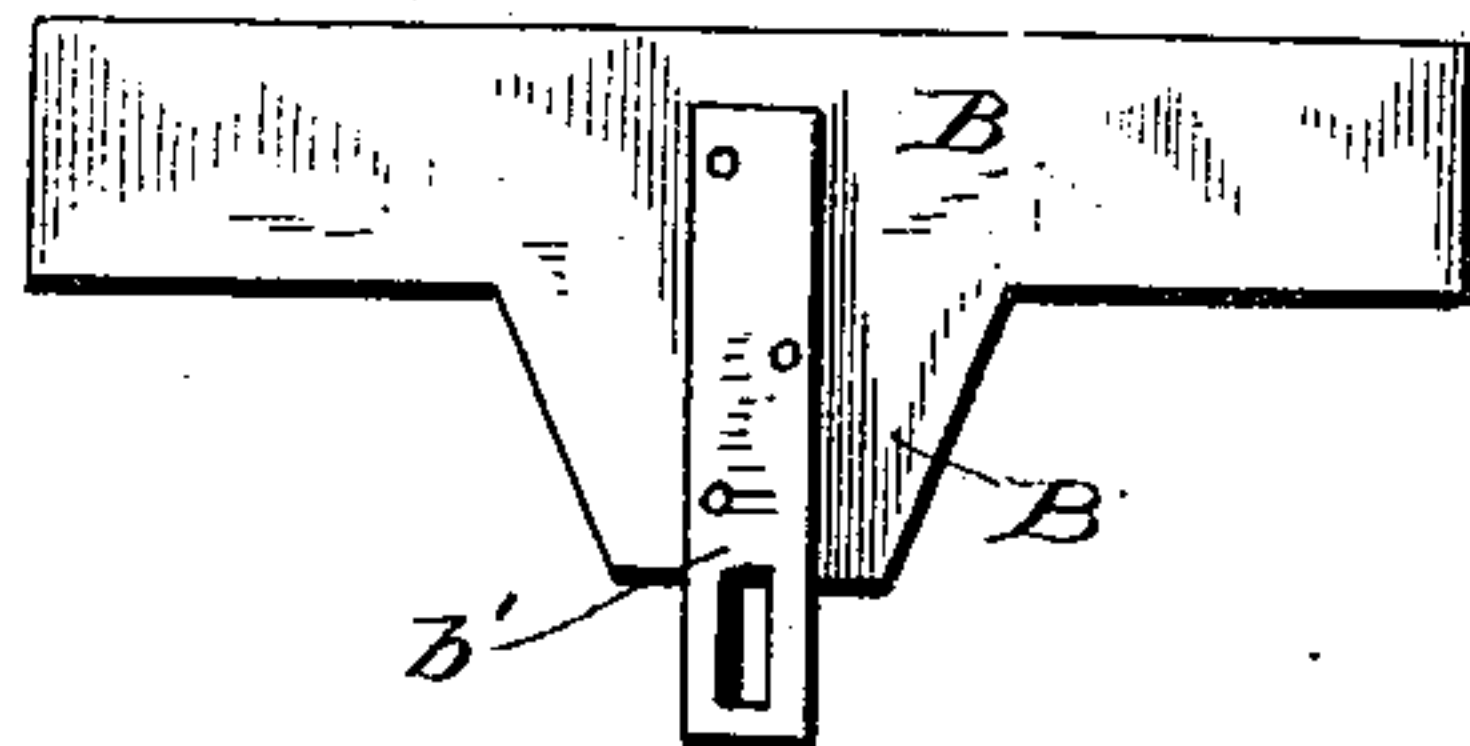
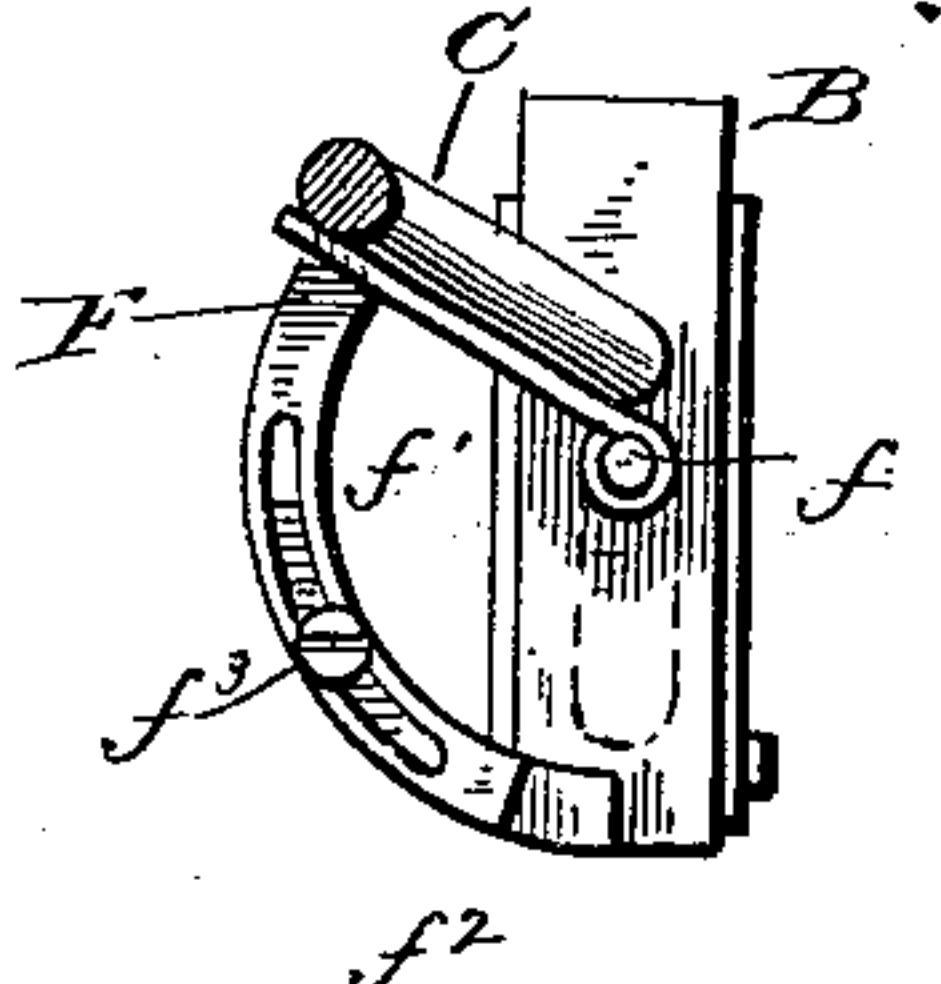
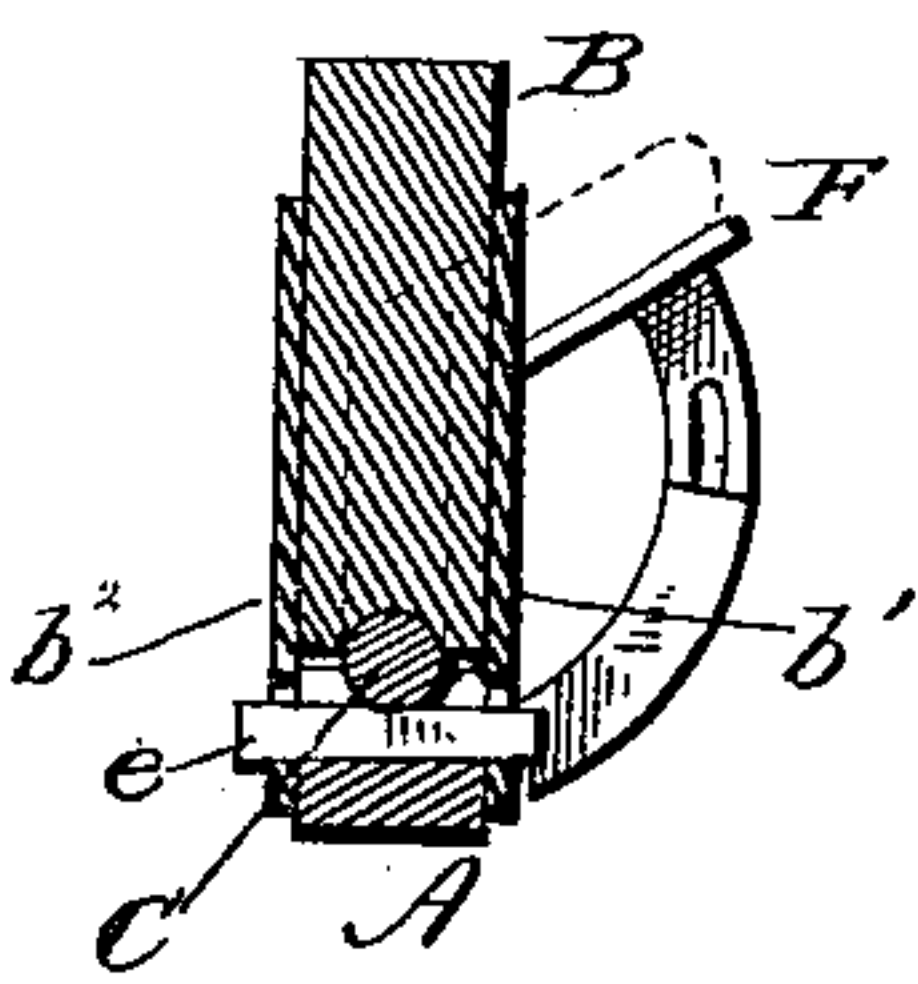
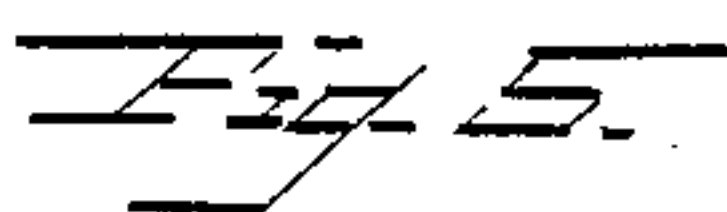
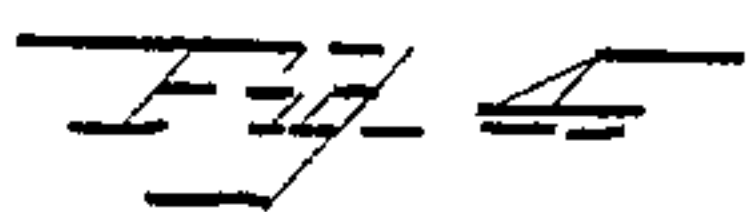
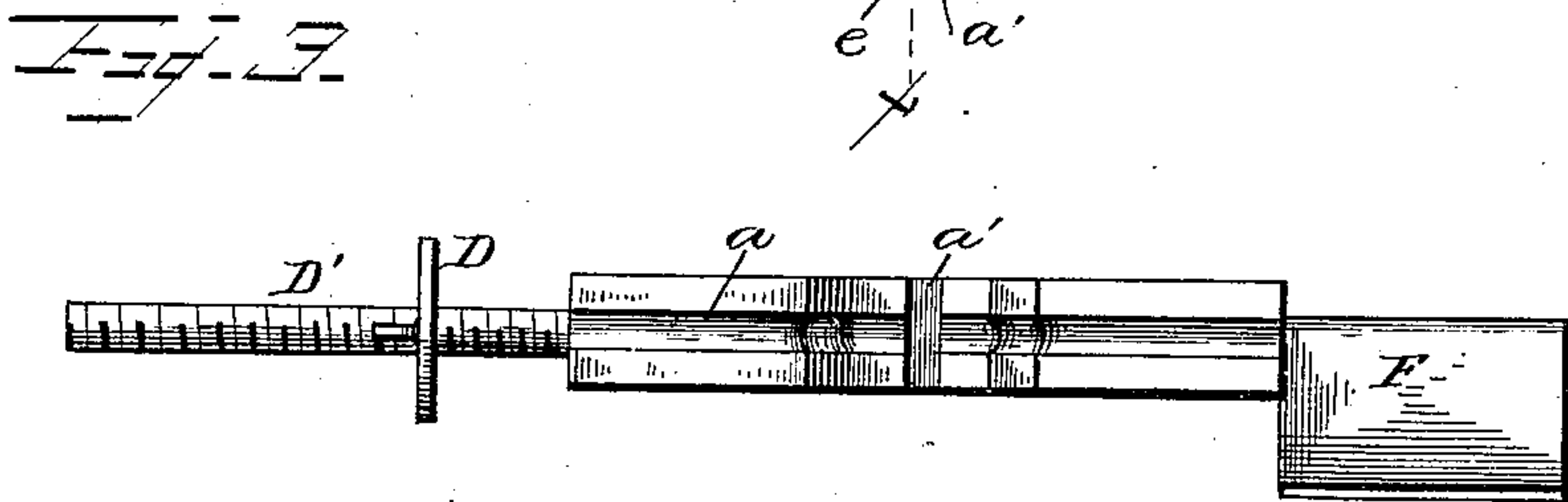
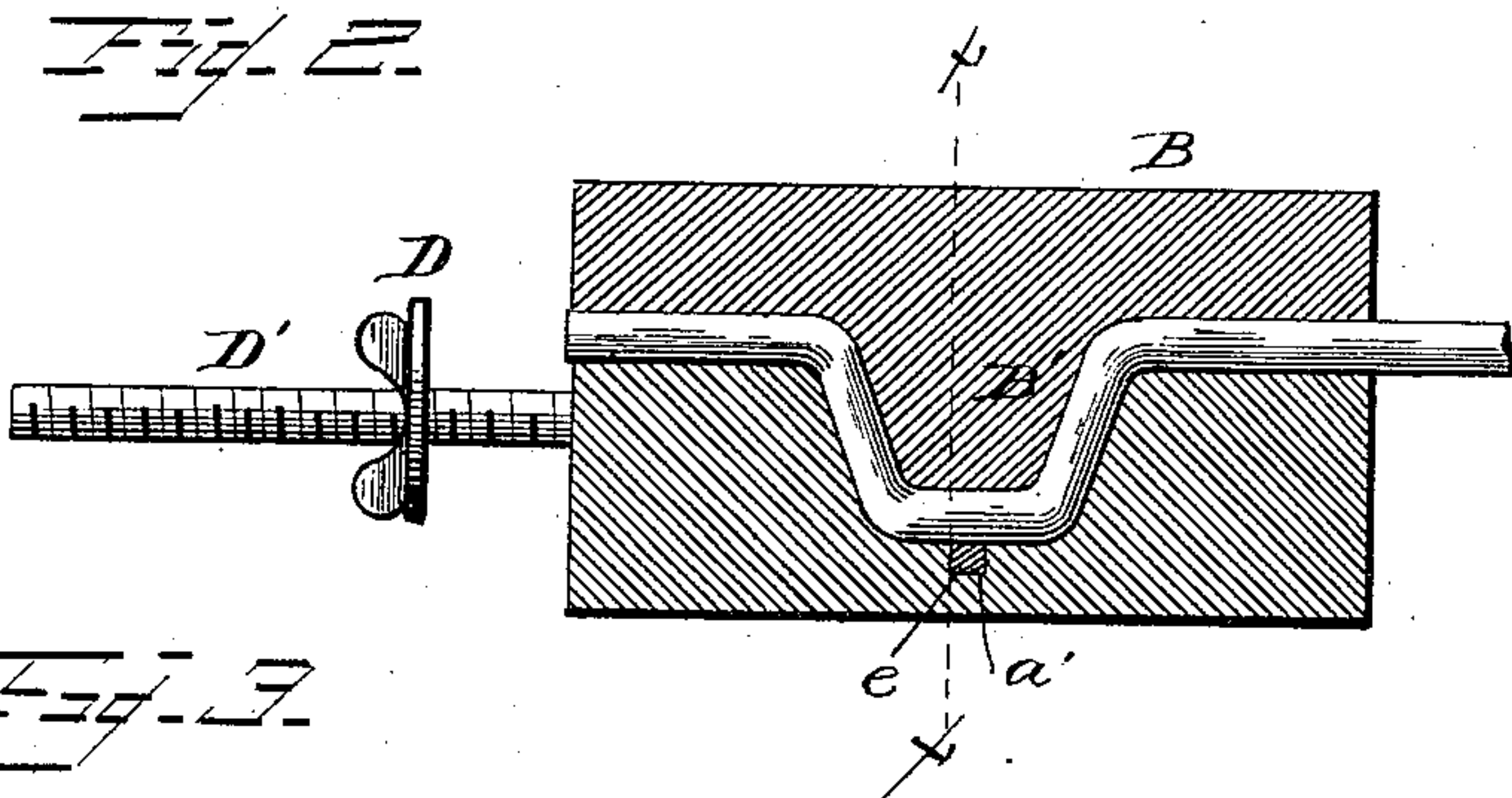
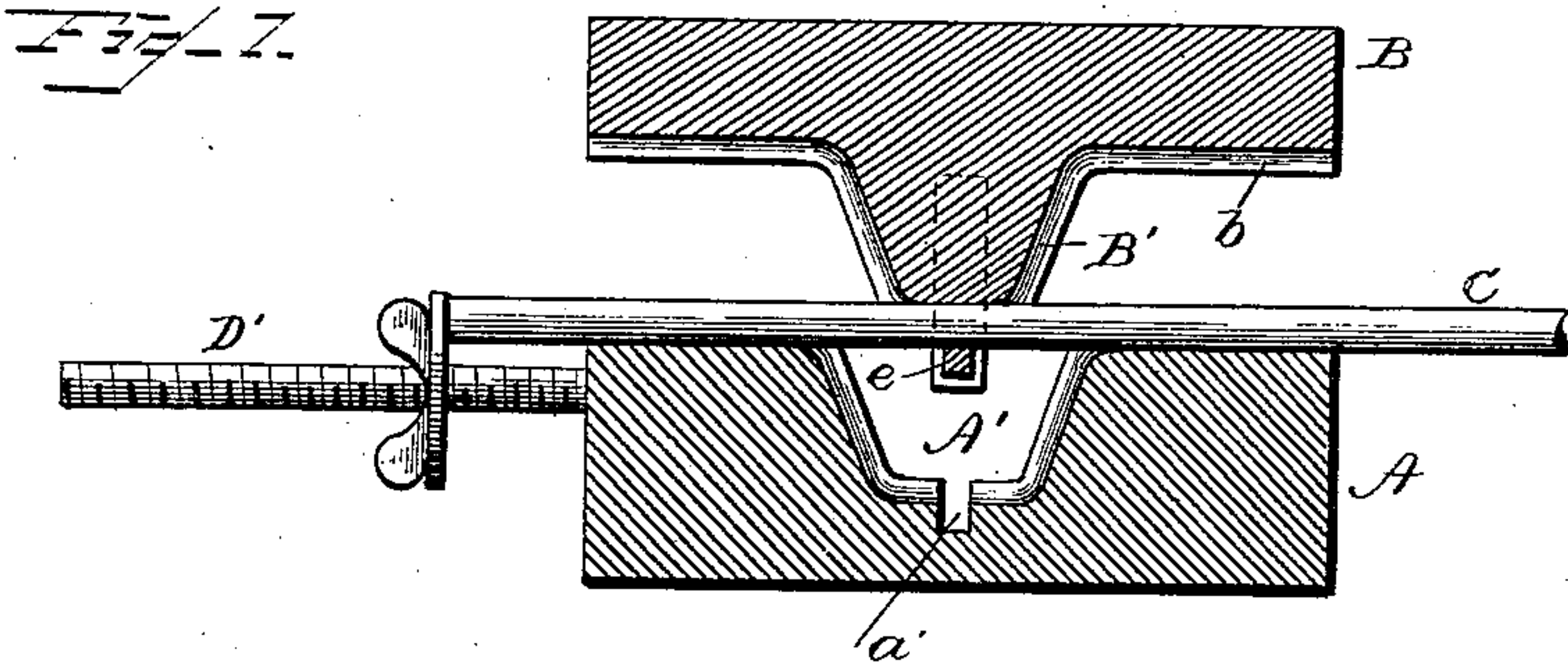
(No Model.)

J. H. THOMAS.

APPARATUS FOR BENDING METAL BARS.

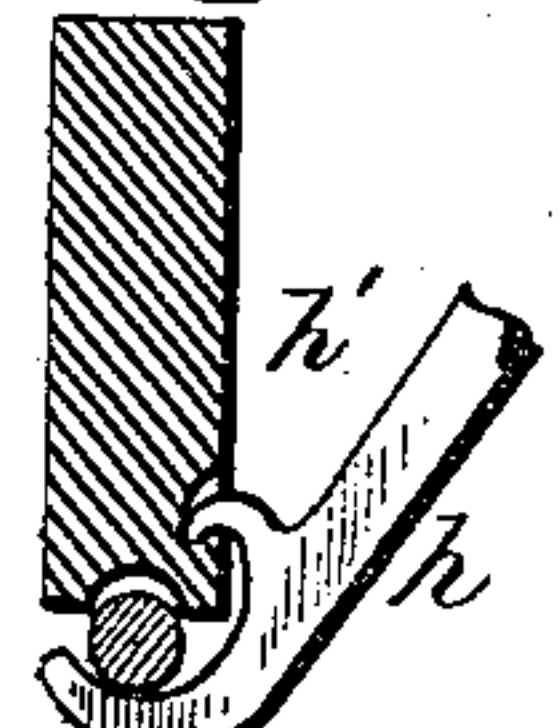
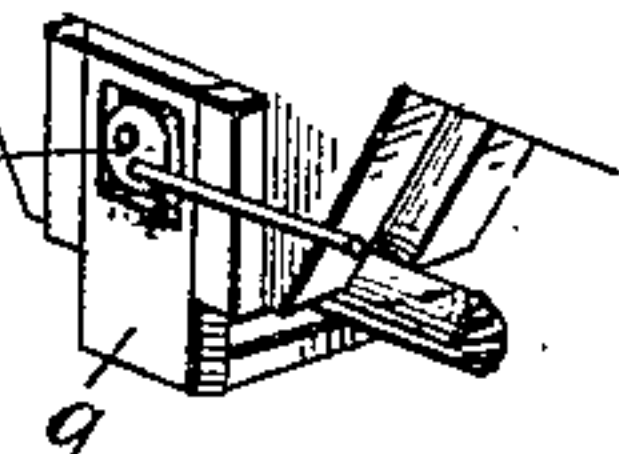
No. 312,303.

Patented Feb. 17, 1885.



WITNESSES

F. L. Ourand
Geo. H. Rundel, Jr.



INVENTOR
John H. Thomas
by S. M. Smith
Attorney

UNITED STATES PATENT OFFICE.

JOHN H. THOMAS, OF SPRINGFIELD, OHIO.

APPARATUS FOR BENDING METAL BARS.

SPECIFICATION forming part of Letters Patent No. 312,303, dated February 17, 1885.

Application filed May 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. THOMAS, of Springfield, county of Clark, and State of Ohio, have invented a new and useful Improvement in Apparatus for Bending Metal Bars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a novel means for bending rods or bars of metal to form cranks, or for other purposes, and is more especially designed for the forming of cranks for use in hay-tedders for actuating the tedder-teeth, and for other similar purposes; but it will be apparent that it may be employed for bending rods or bars of metal for various uses other than that named.

It consists in the combination, with a die and former of the configuration required for giving the desired form or bend to the rod or bar, of a clamp or holder for grasping the rod or bar, holding it in the desired relation to the die and former, and preventing its slipping; and, also, in the employment, in connection therewith, of a gage or gages for setting the rods or bars in proper relation to the die and former, whereby any desired number of uniformly cranked or bent rods may be formed; also, in the combination, with the die and former, of a gage or shelf for supporting a crank previously formed in a rod or bar at the desired angle to the one to be formed, which shelf or gage may be adjustable for varying the angle or relation of the cranks to each other, as may be required.

In the accompanying drawings, Figure 1 represents a longitudinal section through the die or base-plate and former, showing the gage for setting the rod or bar, with the latter clamped in position for bending; and Fig. 2 is a similar view showing the parts in the position they assume when the bend or crank has been formed in the bar. Fig. 3 is a face view of the die or base-plate, with its gages for placing or setting the bar therein, and for supporting a previously-formed crank and determining the angle of relation thereto of the crank to be formed. Fig. 4 represents a transverse section on line *xx*, Fig. 2; Fig. 5, an end view of the apparatus; Fig. 6, a side elevation of the "former," and Figs. 7 and 8 detail views

showing modifications in the form of the clamps.

A represents the die or base-plate, (shown in the form of a rectangular block,) of metal, with a depression at A' in its face at about the center of its length, extending across the face of the block, and corresponding in form to the bend or crank it is desired to form in the metal rod to be operated upon; and B is the former, corresponding in shape to and snugly fitting the face of the die, having a tapering projection, B', formed upon it and fitting the depression A'. The adjacent faces of the die and former have each a longitudinal groove of semi-cylindrical or other suitable form, conforming to the shape of the rod or bar to be operated upon, and extending from end to end through the depression for the crank and the projection on the former, as indicated at *a* and *b*. The die has a transverse groove, *a'*, formed in its face at or near the center of the length of the depression A', said groove extending from side to side of the die, for a purpose which will be explained, and the former B has secured to or formed upon its sides slotted arms or ears *b'* and *b''*, arranged at the sides of the projection B', and in the same transverse plane with the groove *a'*, as shown.

C in Fig. 1 represents the rod or bar to be operated upon, placed within the longitudinal groove *a*; and D, a thumb disk or nut adjustable on a screw-threaded rod, D', secured to one end of the die or block A, said thumb nut or disk D serving, when properly adjusted, to determine the relation of the rods or bars to the die and former, the rods being placed in succession in the die, with their adjacent ends abutting against said disk. When a rod is thus placed in the die A and the former B is brought against it until the rod rests in the groove *b* in the face of the projection B' thereof, a wedge, *e*, is passed through the slots in the arms *b'* and *b''* on the outer side or below the rod C, and said wedge, being driven in tightly, serves to clamp the rod C snugly within said groove *b* against the face of projection B', and thereby to effectually hold it against displacement in the process of bending. The bar or rod C is heated before being placed in position to facilitate the bending of the same, and after it has been so placed and secured, as described, the former is forced to place in the

die by any suitable means for that purpose, forming the bend or crank in the rod or bar, in a manner that will be readily understood.

To the end of the die A opposite the gage
5 D is secured a short shelf, F, of sufficient width and length to form a support for one of the cranks formed in the rod or bar C, said shelf being by preference connected with the die or block A by a longitudinal pivot at *f*,
10 permitting its adjustment, and having a slotted segment, *f'*, connected with it, through which a set-screw, *f*³, passes into a segment, *f*², attached to the block or die A, by which means the shelf F can be set and held at any
15 desired adjustment. This feature is important in machines like hay-tedders employing a series of cranks for actuating the tedder forks or teeth, in which the cranks are set at different angles, varying from ninety degrees to one
20 hundred and eighty degrees apart, the shelf F being made adjustable to suit such variations in the distance apart of the cranks.

The means for holding the shelf at any desired adjustment may of course be varied, and
25 where it is employed only in the manufacture of cranks placed at a uniform distance apart it will not be necessary to make it adjustable. It serves as a support for a crank that has been formed in the shaft, and the angle at which it
30 is set and in which it supports said crank serves to determine the angle of relation of the crank to be formed to that last formed in the shaft, the angle of relation shown in Fig. 5 being one hundred and twenty degrees, and
35 giving three cranks to the circle.

The means for clamping the rod or bar to the former may also be varied. Thus in Fig. 7 an angle-iron clamp, *g*, is shown, which may move in suitable ways on the side of the
40 former, and be operated by means of an eccentric at *g'*, pivoted to the former, and in Fig. 8 a forked lever, *h*, one arm of which is made in the form of a hook, *h'*, and enters a socket in or an eye or staple on the side of the former, is

shown for clamping the rod to the latter, in 45 lieu of the slotted ears and wedge. The wedge or clamp, when the former is forced inward in the die, enters the transverse groove *a'*, formed in the die for its reception, thus permitting the die and former to be brought snugly to- 50 gether.

Having now described my invention, what I claim as new is—

1. In an apparatus for forming cranks or bends in rods or bars of metal, the combina- 55 tion, with the die and former for bending said bars, of a gage for setting and a clamp for holding the bars in the desired relation to said die and former, substantially as described.

2. The combination, with a die and former 60 for bending or forming cranks in rods or bars of metal, of a shelf or support arranged at an angle to the crank to be formed in the bar, for gaging the angle of the latter and supporting the crank previously formed in said bar, sub- 65 stantially as described.

3. The combination, with a die and former for bending or forming cranks in metal bars or rods, of an adjustable gage or support for the cranks previously formed in said rods or 70 bars, for gaging the angle of relation thereto of the crank to be formed therein, substantially as described.

4. The combination, with the die and former for bending or forming cranks in metal bars, 75 of a gage for setting said bars in proper relation to the die and former, a clamp for holding said bars while the cranks are being formed, and a gage or support for the crank previously formed therein, substantially as and for the 80 purpose described.

In testimony whereof I have hereunto set my hand this 28th day of May, A. D. 1884.

J. H. THOMAS.

Witnesses:

H. B. ZEVELY,
REX. M. SMITH.