

(No Model.)

C. A. BERTSCH.
METAL SHEARING MACHINE.

No. 351,619.

Patented Oct. 26, 1886.

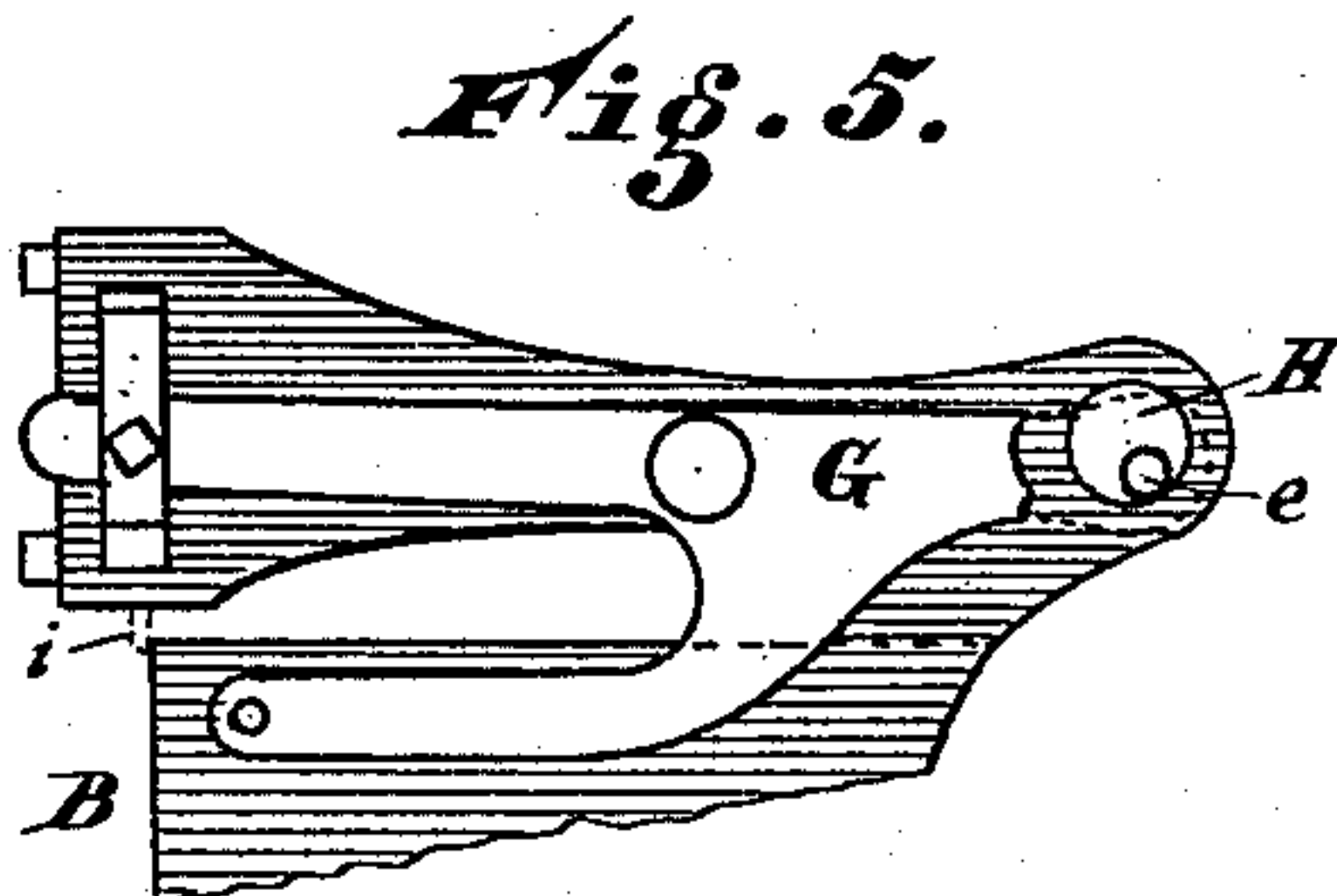
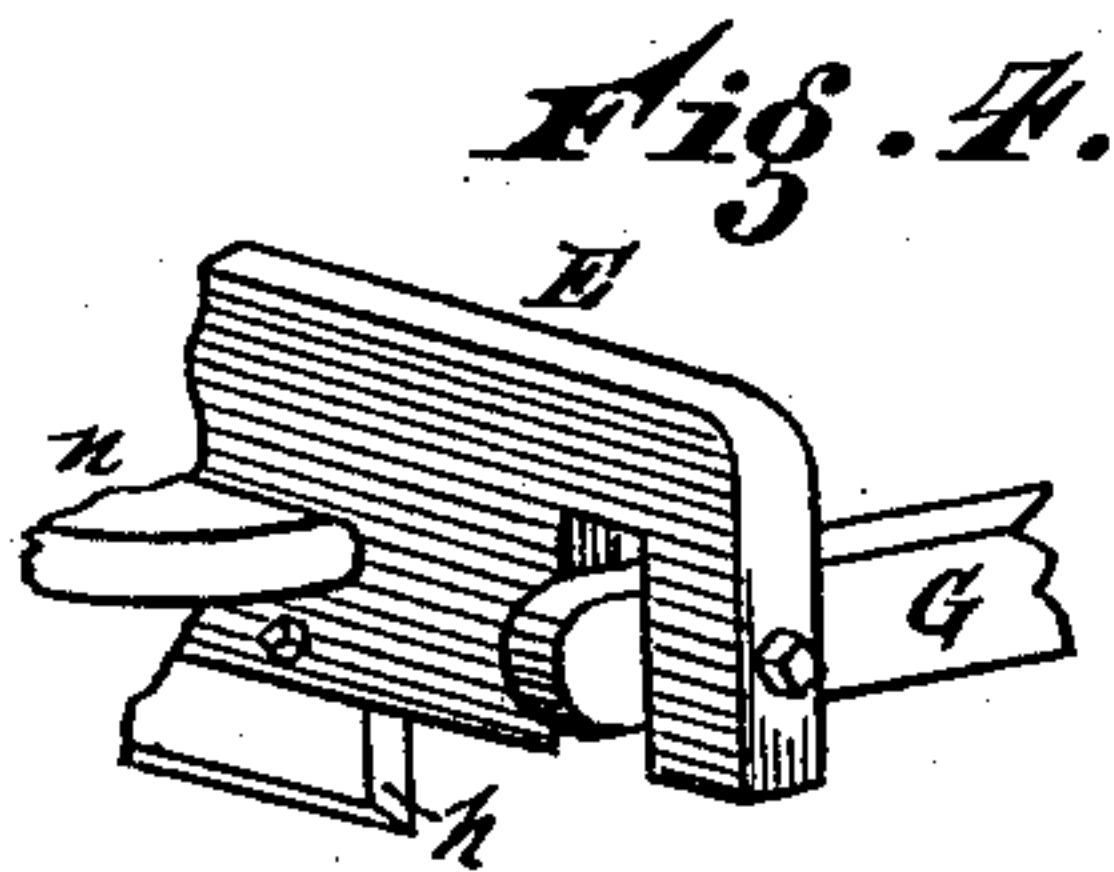
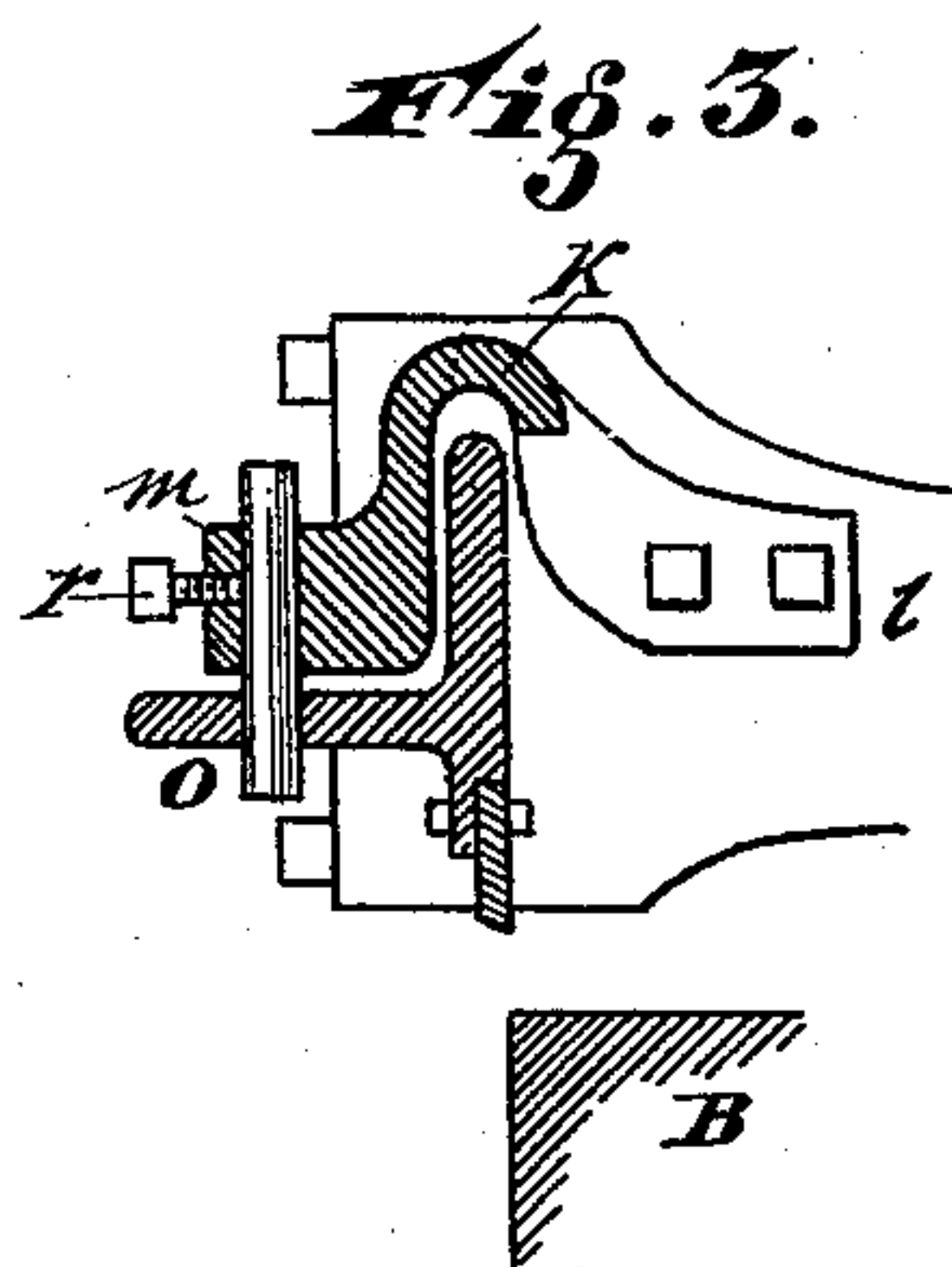
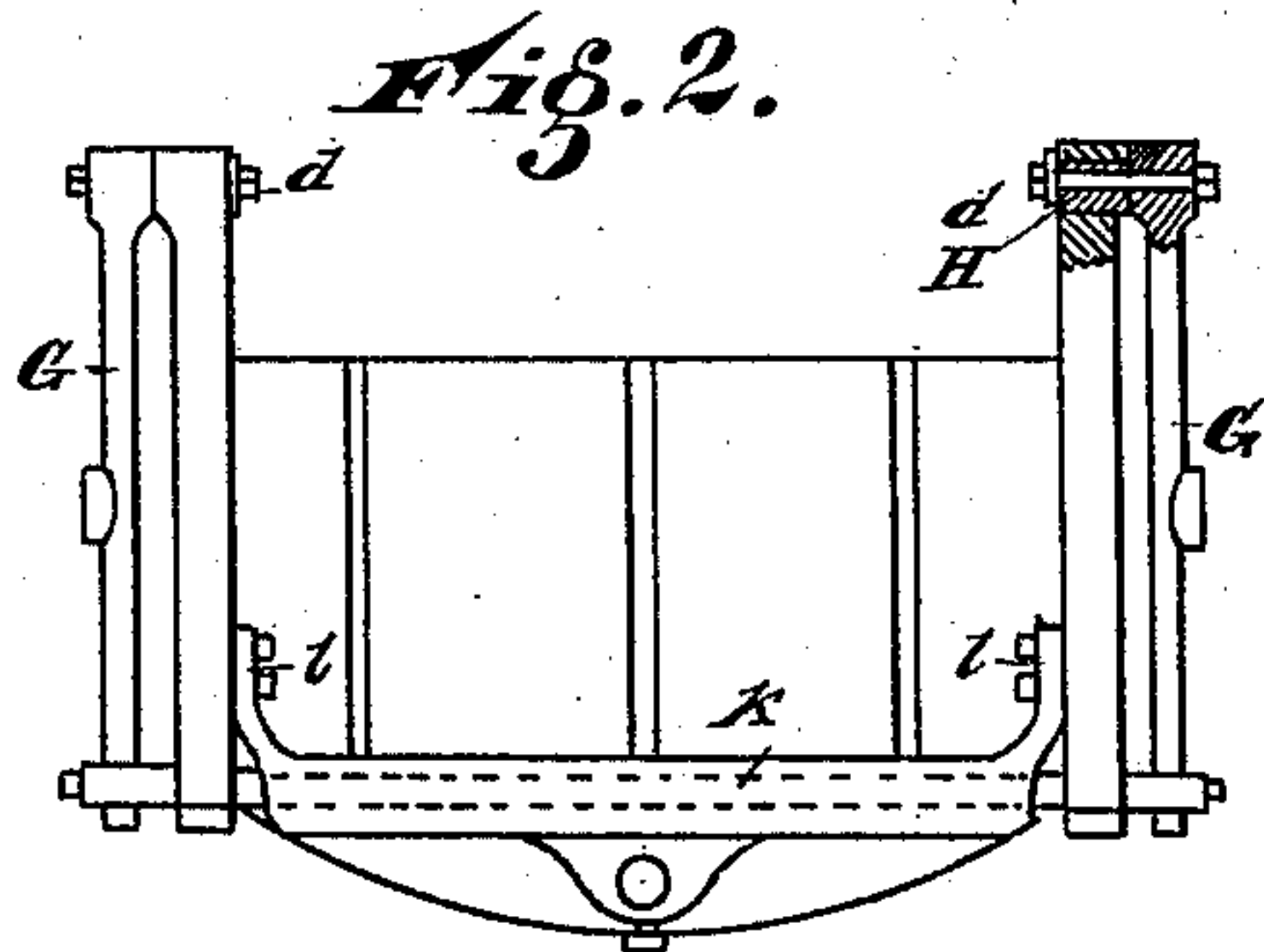
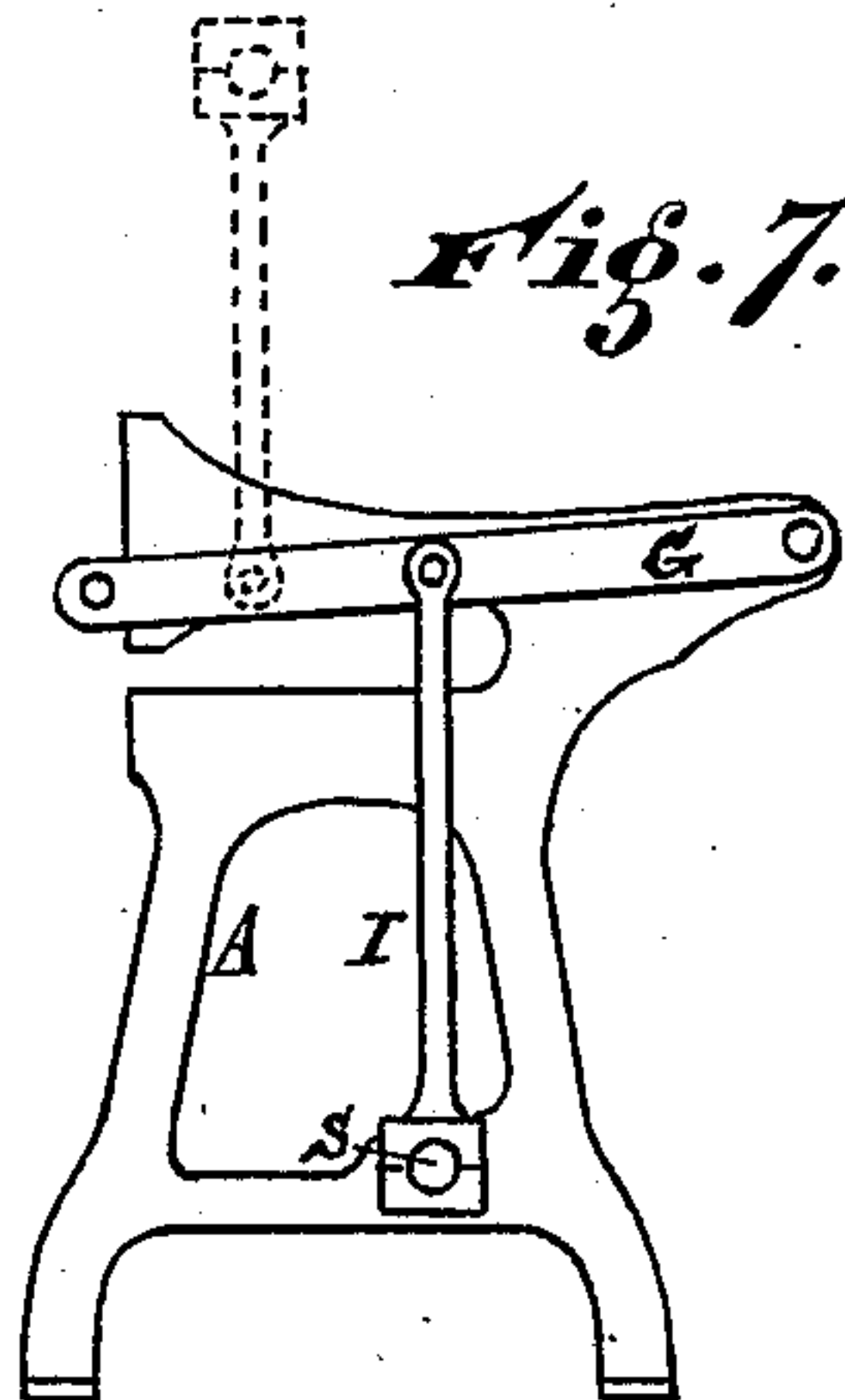
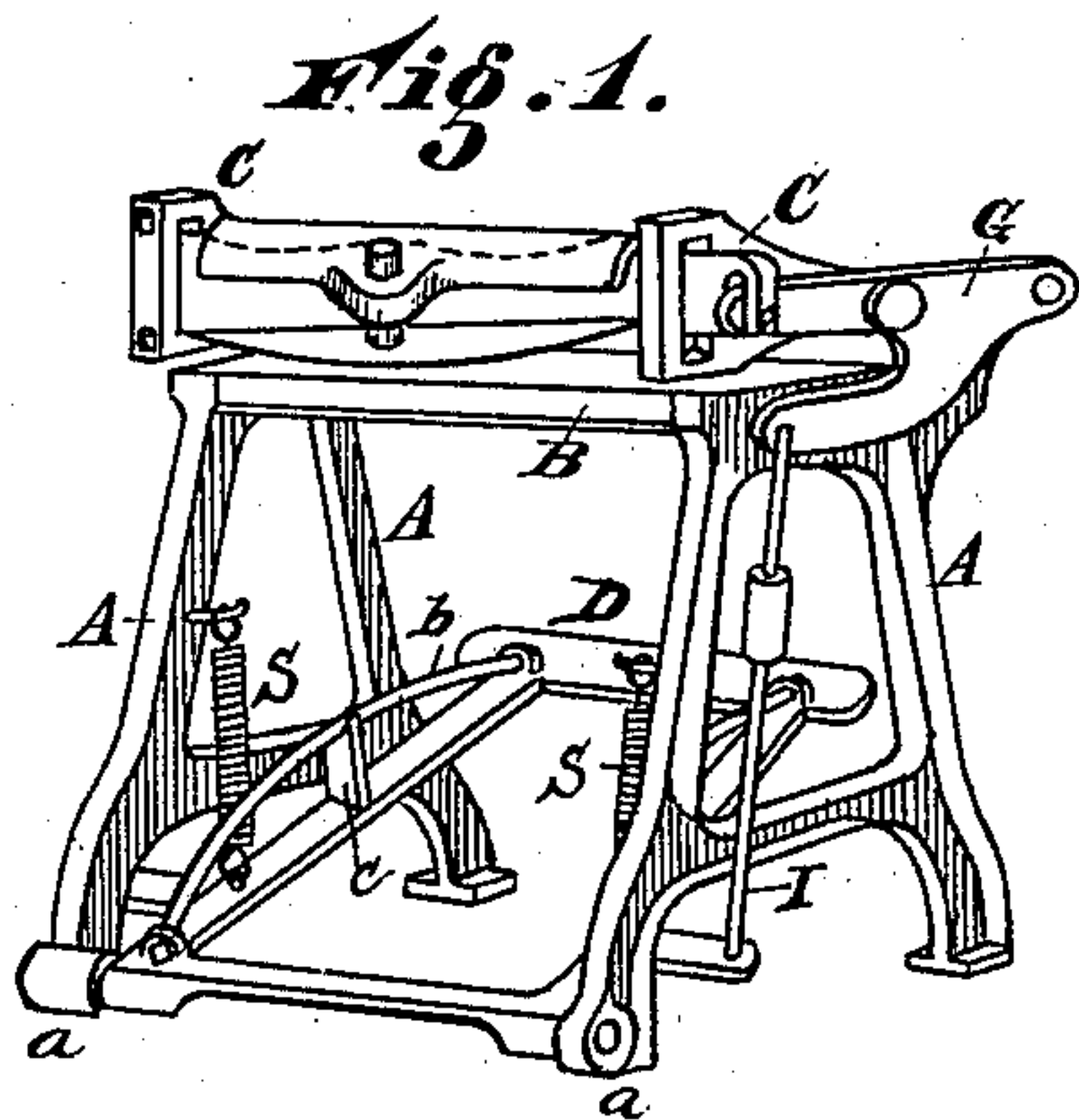
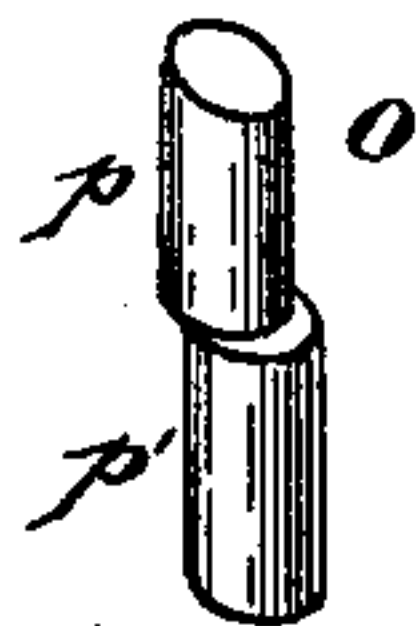


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES A. BERTSCH, OF CAMBRIDGE CITY, INDIANA.

METAL-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 351,619, dated October 26, 1886.

Application filed March 30, 1886. Serial No. 197,221. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BERTSCH, of Cambridge City, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Metal-Shearing Machines, of which the following is a specification.

My invention relates to the construction of mechanical devices for operating the gate and shear of metal-shearing machines.

One of the objects of my invention is to provide improved means for moving the forward end of the driving arms in vertical planes.

Another object of my invention relates to the method of constructing the driving-arms and connecting them to the treadle, so as to cheapen the cost and strengthen the parts, and improve the operation.

Another object is to place the bridge-tree above the stock and connect them by means of a guide on the outside, so that the line of shear-edges will be unobstructed and in plain view of the operator, all of which will be fully set forth in the description of the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of my improved shearing-machine. Fig. 2 is a top plan view. Fig. 3 is a central vertical section of the shear-stock and bridge-tree support. Fig. 4 is a detail view of one end of the stock and shear. Fig. 5 is a side elevation of one of the driving-arms attached to the frame. Fig. 6 is a detail view of a guide-pin. Fig. 7 is a modification of the driving-arms operated by power.

A represents the posts of the frame; B, the table or bed supported by the posts.

C represents overhanging arms attached to the front posts and projecting rearward, as shown in Fig. 1.

D represents a treadle-frame, pivoted at *a* to the foot of the rear posts.

b represents truss-rods connected to the front and rear arms of the treadle.

c represents struts for supporting and straining the truss-rods.

S represents a retractile spring for retracting the treadle and raising the shear-blade.

E represents a shear stock or gate, which is desired to move in a vertical plane; operated by the treadle D.

This is accomplished as follows: G repre-

sents driving-arms hinged at the front ends to arms C of the frame. H represents crank or eccentric shafts journaling in arms G at *d*; *e*, a stud or crank-pin journaling eccentrically in part H, and forming a center for the driving-arms G. I represents links or pitmen, hinged at their lower ends to treadle D, and at their upper ends to arms G. This arm for small machines is bifurcated, one fork being hinged to stock G and the other fork hinged to the pitman I, so as to allow metal to be fed between the forks to the shears.

Figs. 1 and 3 show the driving-arms and shear-stock elevated. When treadle D is depressed, pitmen I draw the rear ends of the driving-arms G down, and the eccentrics, stud-pins *e*, and crank *d* move around in their centers into the position shown in dotted lines *i*, Fig. 5. This movement of the parts moves arm G longitudinally, causing the stock E and shear *h* to move vertically. I have shown the crank or stud pin *e* as passing through driving-arm G and through the crank-journal *d*, with a head on one end and a nut on the other, so as to hold the parts together; but I do not wish to limit myself to the details of constructing the eccentric movement of the driving-arms, though I deem the form shown the best.

In order to hold the shear *h* steady, I have provided the following means of supporting it at a point between the ends:

K represents a bridge-tree, provided at each end with arms or straps *l*, through which bolts pass to secure it to the overhanging arms C. It is made of arch or curved form in cross-section, to span a bridge over the shear-stock E.

m represents a boss projecting down over the flange or rib *n*, formed on the stock E.

O represents a guide-pin. It is preferably made of two different cylindrical sections, one eccentric to the other, as shown in Fig. 6, the upper section, *p*, being secured in the flange *m* of the bridge-tree, and the free end *p'* projecting down through a hole in flange or rib *n*, so as to serve as a central guide to the stock. I make the sections *p p'* of the guide eccentric to each other, so as to allow it to be adjusted circularly to take up lost motion in case of wear on the pin or in the guide-orifice in rib *n*. This pin is held in position by means of a set-screw, *r*, which allows it to be adjusted.

By having these parts on the outside of stock E and shear *h*, the space on the front side of the shear blade is entirely open, and allows the operator to see the mark on the metal for cutting and to accurately present it to the shears.

The stationary blade of the shears is attached to the rear edge of the table in the usual manner.

I have shown the driving arms G pivoted to the end of the shear-stock or gate E near the lower edge. This, together with the longitudinal movement of the driving-arms G, draws the cutting-edge of shear *h* close to the stationary blade, and avoids the tendency of the shear to spring off, and cutting the metal smoothly and accurately.

When the machine is to be driven by power, a straight arm may be used, as shown in Fig.

7. The arm G is hinged to the frame in the same manner as shown in the other figures, and its front end is connected to the shear in a similar manner. The pitmen I are driven by an eccentric, *s*. The pitmen and eccentric are shown in full lines as operated from the machine, and the same parts are shown in dotted lines when the power is applied from a point above the machine.

I claim—

1. In a shearing-machine, the combination of the arms G, hinged to the shear-stock and to the treadle at one end, and at the front ends to the frame by eccentric cranks, whereby the arms G move longitudinally and the shear-stock vertically as they are operated by the treadle D, substantially as specified.

2. In a shearing-machine, the arms G, hinged at their front ends to the frame, so as to move longitudinally, and bifurcated at the forward end, one of the forks being hinged to the pitmen and the other to the shear-stock, so as to allow metal to be inserted laterally between said forks, substantially as specified.

3. In combination with the arms C of a shearing-machine, the arched bridge-tree K, secured above the shears and provided with a boss, M,

and a guide, O, for bracing the shear stock, substantially as specified.

4. In combination with the arms C of the shearing-frame, the arched bridge-tree K, connected thereto by flanges *l* and curving over the shear-stock E, substantially as specified.

5. In combination with the bridge-tree K, the guide O, secured to the bridge-tree in rear of the shear-stock and projecting below the bridge-tree to serve as a guide for the shear, substantially as specified.

6. In combination with the shear-stock E, the driving-arms G, hinged below the center of said stock and hinged to the frame, so as to move longitudinally and draw the moving blade *h* against the stationary blade, substantially as specified.

7. In combination with the shear-stock E, the flange *n*, attached to its rear side, and a guide, O, secured to the bridge-tree and projecting through said flange, substantially as specified.

8. In combination with the bridge tree K and the shear-stock, the guide O, formed of two eccentric sections, *p p'*, substantially as and for the purpose specified.

9. In a shearing-machine, the arm G, hinged at its front end by an eccentric or longitudinally-moving joint, and its rear end hinged to the shear-stock and operated by depressing the arm and shear-stock, the former moving longitudinally and vertically and the latter moving perfectly plain, substantially as specified.

10. In combination with the treadle D of the shearing-machine, the truss-rods *b* and struts *c*, for supporting the treadle against the strain of the pitman I, substantially as specified.

In testimony whereof I have hereunto set my hand.

CHARLES A. BERTSCH.

Witnesses:

JNO. S. ROEBUCK, Jr.,

M. E. MILLIKAN.