N. KRUMP.

BENDING BRAKE.

APPLICATION FILED MAR. 8, 1918.

1,283,808.

Patented Nov. 5, 1918.

3 SHEETS—SHEET 1.

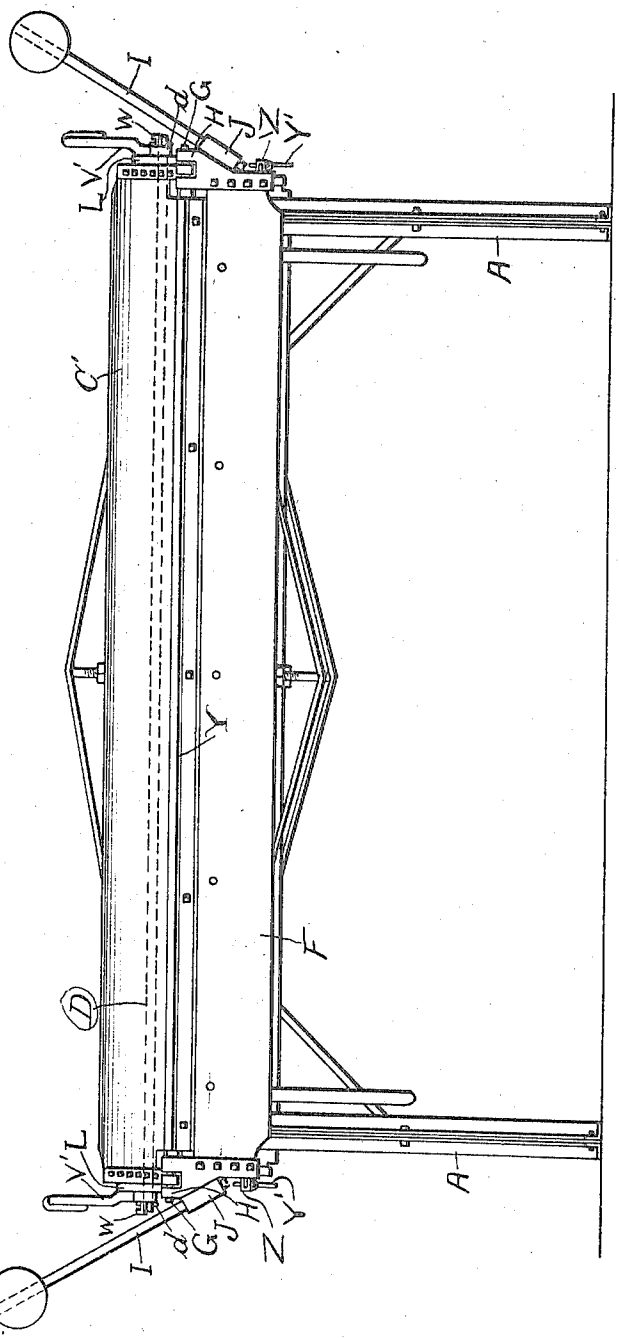


Fig. 1.

Witness:
E. Jacker

Inventor:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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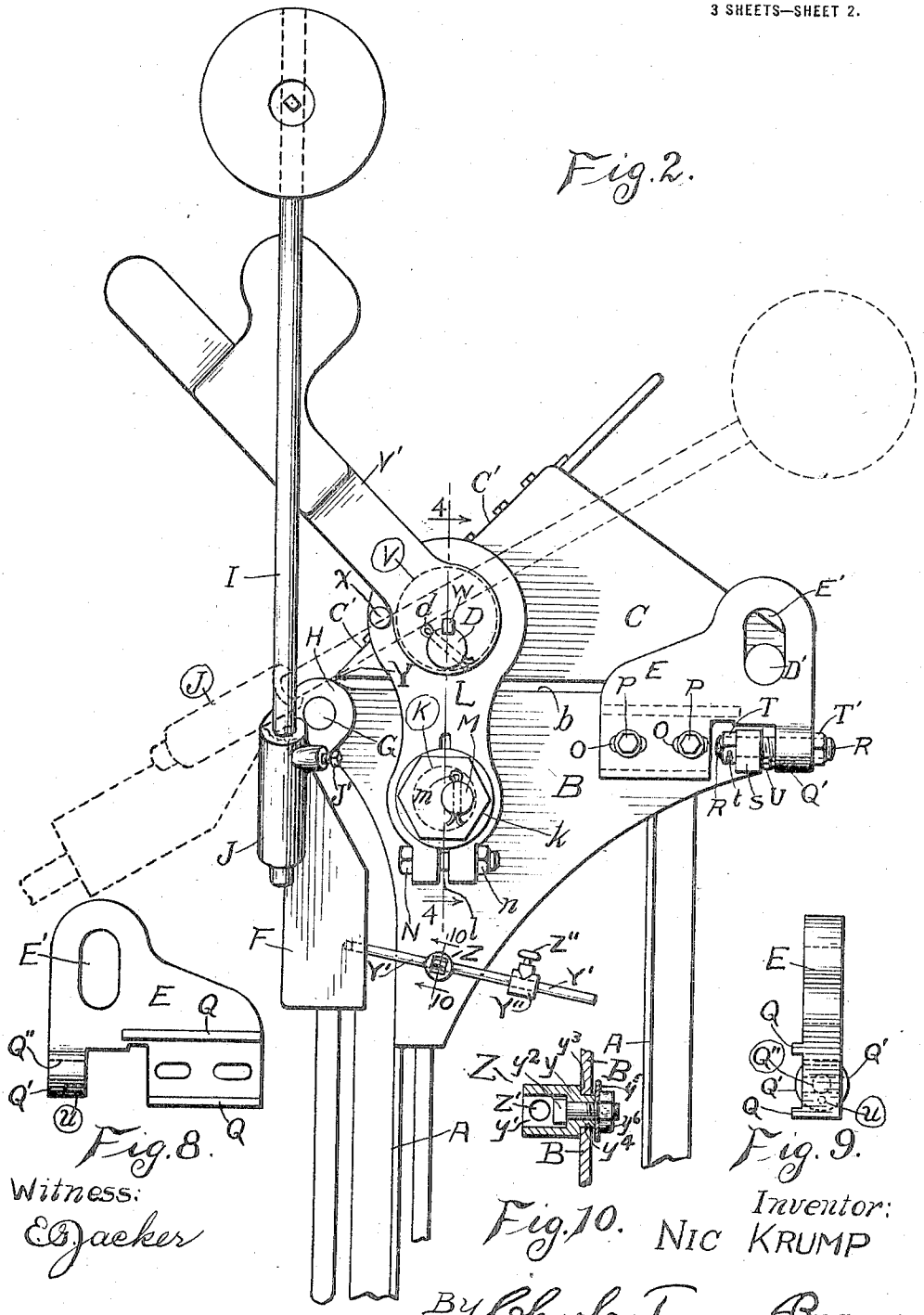


Fig. 2.

Fig. 8.

Fig. 9.

Fig. 10.

Witness:
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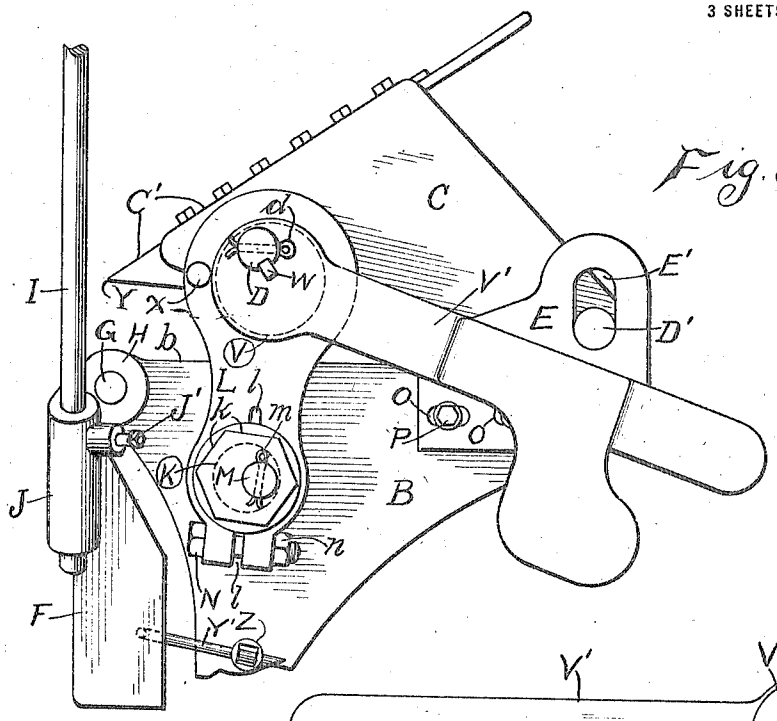


Fig. 3.

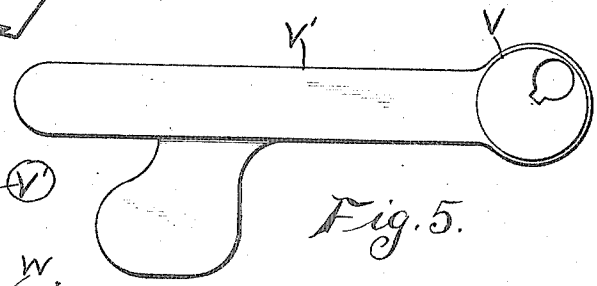


Fig. 5.

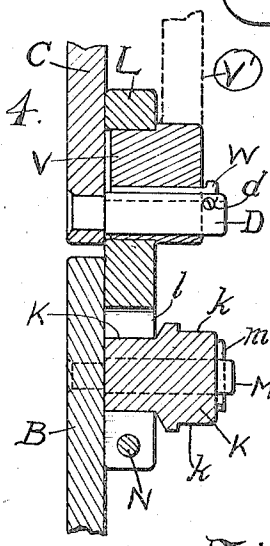


Fig. 4.

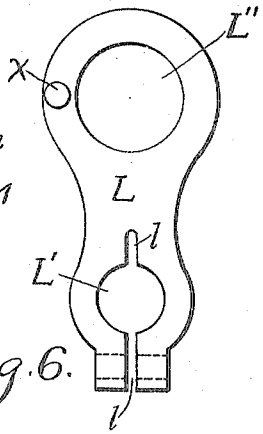


Fig. 6.

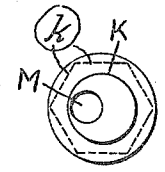


Fig. 7.

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UNITED STATES PATENT OFFICE.

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BENDING-BRAKE.

1,283,808. Specification of Letters Patent. Patented Nov. 5, 1918.

Application filed March 8, 1918. Serial No. 220,713.

To all whom it may concern:

Be it known that I, NIC KRUMP, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bending-Brakes, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a specification.

This invention relates to bending brakes designed to be operated by hand or power and which are adapted to bend sheets or bars of metal of varying thickness from light to heavy.

The principal objects of the invention are, in a brake provided with an adjustment of the movable and clamping jaw of the brake which will position said jaw to permit the same, by additional operative means, to be opened widely and closed firmly down on any determined thickness of metal, within the capacity of the machine, which is to be bent thereby, to clamp said metal in place, to obtain means to position said movable jaw when clamped on said metal so that the front edge of said jaw, over or on which said metal is to be bent, will be advanced or retracted relative to the movable apron of the brake to be in suitable position for said determined thickness of metal.

An additional object is to obtain adjustable means to limit the closing movement of said movable jaw.

To those skilled in the art it is known that when a plate or bar of metal which is of a thickness approaching the capacity of a given bending brake is to be bent thereon, the movable jaw which clamps the metal in position must be brought down on said metal with considerable force; and when the greatest possible bend is to be given to said metal the part thereof in contact with the apron of the brake is brought into contact with a face of said jaw, and said face is parallel with the face of the apron making the bend; and at said time said faces should be substantially the same distance apart as said metal is thick.

By the adjustments of the movable jaw herein described and illustrated the apron of the brake is constructed to turn on a shaft (or short shafts in axial line), which is mounted in non-adjustable journal bearings which are rigidly or immovably mounted on the brake.

It is also well known that when metal of short lengths, as compared with the capacity of the brake, are to be bent said short lengths may be firmly clamped in place by an operator standing at one end of the brake and moving only one end of the movable jaw of said brake.

In the drawings,

Figure 1 is a front view of the brake embodying the invention on a smaller scale than are the remaining figures of the drawings.

Fig. 2 is an end view of the operating parts of the brake with the jaws closed.

Fig. 3 is a like end view with the jaws open.

Fig. 4 is a vertical section on line 4—4 of Fig. 2 viewed in the direction indicated by the arrows.

Fig. 5 is a detail of the bending lever and cam.

Fig. 6 is a detail of a link forming an element of the device, and

Fig. 7, is a detail of an adjustable cam, viewed from the opposite side to that which is illustrated in Figs. 2 and 3.

Fig. 8 is a rear elevation of an adjustable journal bearing for the shafts at the back edge of the apron of the brake, and

Fig. 9, is an end view of said journal bearing, and

Fig. 10 is a vertical section of a stop member.

A reference character applied to designate a given part indicates said part throughout the several figures of the drawing wherever the same appears.

A, A, represent legs forming the standard of the brake. B, represents a body, having the bed *b* thereon which is rigidly secured to the standards A. The several movable parts of the brake are mounted on body B, and coact with bed *b* to bend a bar or sheet of metal which is clamped to said bed. C represents a movable jaw which is adjustably mounted on body B. C′ is the face of the jaw C against which a portion of the bar or sheet bent in the brake may be forced by the apron of the brake.

D, D′ represent shafts mounted in jaw C, (to extend beyond the ends of said apron) adjacent to the front and rear edges thereof. Shaft D is rotatable and *d* represents a cotter pin in said shaft. E is an adjustable bearing which is provided with slot E′ in which slot the shaft D′ is journaled. F represents the apron of the brake. G repre-

sents a shaft on body B, and H a journal bearing on apron F which rotates on said shaft G when the apron is turned to bend metal, in the operation of the brake. I, I represent weighted levers which are adjustably attached to apron F, by means of sockets J, to lessen or increase the length thereof, and J′ represent set screws to secure said levers in an adjusted position in said sockets. K represents a cam which turns in aperture L′ of link L, to adjustably lessen or increase the length of said link. Cam K turns on shaft M and said shaft is rigidly mounted on the ends of the body B. *l* represents a slot in the lower end of said link L, and L′ a circular aperture in the upper end thereof.

Each end of the brake is provided with a cam K and link L on a shaft M as above recited. *m* represents a cotter pin which extends through a hole provided therefor in shaft M, to retain the cam K on said shaft. Cam K, is provided with faces *k* by means of which said cam may be turned in link L by means of a wrench and N represents a bolt which is provided with nut *n*, by means of which said slotted link L may be firmly clamped to said cam when said cam is turned on shaft N to an adjusted position in said link.

The bearing E is provided with slots O, O and is mounted on the end of body B, by bolts P, P, which extend through the slots O and into the end of said body B, said bearing is also provided with ribs Q, Q on the back thereof which come in contact with the end of the body B and are clamped thereto by bolts P to hold said bearing in adjusted position. To adjust said bearing it is provided with abutment Q′ having an aperture (indicated by broken lines Q″ Figs. 8 and 9) in which the rod R slides freely. Body B is provided with abutment S having an aperture therethrough in axial line with the aperture in abutment Q′ and in which aperture said rod R also slides freely. Rod R is screw threaded and is provided with nuts T, T′. *t* (Fig. 2), represents a set screw holding the nut T, firmly on screw thread rod R. U, Fig. 2 represents a screw threaded bolt fitting into screw threaded aperture *u* indicated by broken lines in Figs. 8 and 9.

To adjust the bearing E, bolts P, P, are loosened and nut T′ is turned on rod R and the bolt, or cap screw U is then turned to abut against projection or abutment S. Bolts P, P are then tightened. The edge Y of jaw C (as well as the face C′ thereof) is horizontally adjusted by the above recited adjustment.

V represents a cam which is rigidly secured to lever V′. W represents a key securing the cam V to the shaft D. When the keys W, at both ends of shaft D, are in place as illustrated in Fig. 1, the turning of either one of the cams V, by means of handle or lever V′, will turn said shaft and the cam V at the other end of the shaft.

X represents a stop pin against which lever V′ comes in contact when the jaws are closed to their fullest extent.

To adjust the forward end, or edge Y of the jaw C, vertically, so as to clamp a given thickness of metal on horizontal table *b*, the nut *n* on bolt N is loosened, cam K is turned on shaft M and, when the adjustment is made, said nut *n* is turned to clamp said cam firmly in link L, (forcing the sides of aperture L′ against cam K).

When a wide sheet of metal is placed on table *b* and jaw C is clamped firmly thereto, the shaft D′ may rise in slot E′; and, assuming the cam K to be properly adjusted for the thickness of said sheet, no appreciable horizontal movement of said jaw will thereby occur.

At times a plurality of bends on one or more sheets, bars or strips of metal, each bend to have the same angle, are desired to be made; and for this purpose the rod Y′ and stop member Z, are provided. One end of rod Y′ is bent and inserted in a hole provided therefor in the end of apron F. The other end of the rod Y′ extends through aperture Z′ in bolt *y* of stop member Z and is provided with the adjustable collar Y″, having set screw Z″ which is adapted to hold said collar in an adjusted position on said rod.

The construction of the stop member Z which is illustrated in detail in Fig. 10 comprises a bolt *y*, provided with a central hole *y′* which for a part of its length is adapted to receive the head y^2 of a bolt and prevent it from turning, and for the remainder of its length to receive the cylindrical portion of said bolt. The member *y* is provided with shoulder y^3, and the part y^4 of said bolt fits loosely in a hole provided therefor in the ends B. y^5 represents a washer and y^6 a nut on bolt *y*. Washer y^5 is forced against the end of bolt *y*, when the stop member is mounted on end B, by nut y^6 and as apron F turns on its fulcrum (G) carrying therewith the end of rod Y′ attached thereto, the rod slides or moves longitudinally in hole Z′, and turns stop member Z in end B. When the adjustable member Y″ comes in contact with the hollow bolt *y* of stop member Z further turning of apron F on fulcrum G is thereby prevented.

The shaft D′ in bearing E forms the fulcrum on which movable jaw C turns when the link L is varied in length and also when the lever V′ and cam V is turned in said link.

I claim:

1. In a bending brake, a body member provided with a table, abutments on the ends

of said body member, and said abutments respectively provided with an aperture therethrough, in combination with bearing members respectively provided with a slot adapted to receive a shaft, and with an abutment, having an aperture therethrough, said bearing members adapted to be mounted on the body member with said apertures in axial line with the apertures in the first named abutments, a screw threaded member longitudinally movable in said apertures, nuts on said screw threaded member adapted to vary the operative length thereof, bolts in said bearing members adapted to be forced against said first named abutments, and means to secure said bearing members rigidly to said body member.

2. In a bending brake, a body member provided with a table, abutments on the ends of said body member, and said abutments respectively provided with an aperture therethrough, in combination with bearing members respectively provided with a slot, and with an abutment having an aperture therethrough, said bearing members adapted to be mounted on the body member with said aperture in axial line with the apertures in the first named abutments, a screw threaded member longitudinally movable in said apertures, nuts on said screw threaded member adapted to vary the operative length thereof, bolts in said bearing members, adapted to be forced against said first named abutments, means to secure said bearing members rigidly to said body member, a movable jaw, shafts on the ends of said jaw adapted to rest in said slots to form fulcrums for said jaw, links, means to vary the length of said links, said means comprising cams rotatably mounted on said body member and means, comprising a cam and a lever thereto, to attach said links to said jaw.

3. In a bending brake which is provided with standards, a horizontal table and a movable jaw, the combination of an apron pivotally mounted on said standards, a rotatable member mounted on the ends of said standard and provided with an aperture transversely therethrough, a rod pivotally attached at one end to said apron and longitudinally movable through the aperture in said rotatable member, a stop adjustably mounted on said rod and means to maintain said stop in an adjusted position.

4. In a bending brake which is provided with standards, a horizontal table and a movable jaw, the combination of an apron pivotally mounted on said standards, a member comprising a hollow bolt, provided with a screw threaded cylindrical portion and a nut on said screw threads mounted on the ends of said standard arranged to turn on said cylindrical portion, and provided with an aperture transversely therethrough, a connecting member attached at one end to said apron and longitudinally movable through said transverse aperture, a stop adjustably mounted on said connecting member, and means to maintain said stop in an adjusted position.

NIC KRUMP.

In the presence of—
CHARLES TURNER BROWN,
J. SCUDDER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."