No. 817,611. PATENTED APR. 10, 1906.

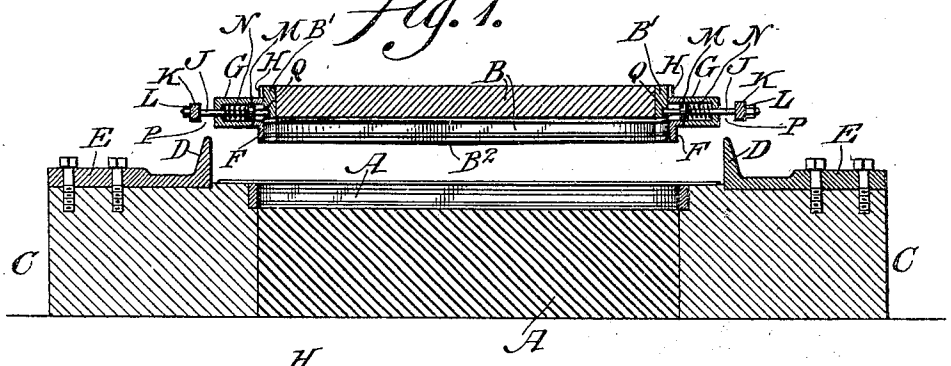
C. B. AGAR.

DIE FOR CUTTING OUT METAL PLATES.

APPLICATION FILED JAN. 26, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



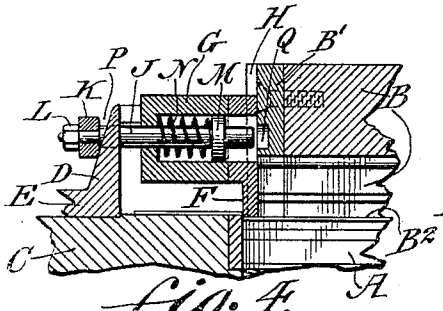




Fig. 4.

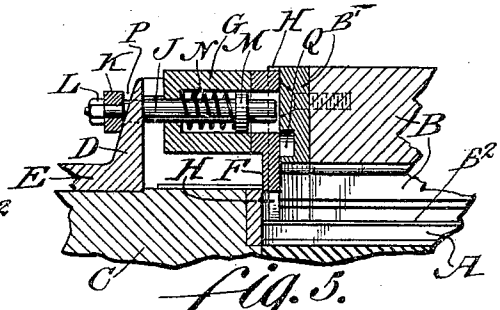



Fig. 5.

Fig. 9.

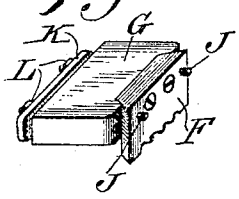



Fig. 8.

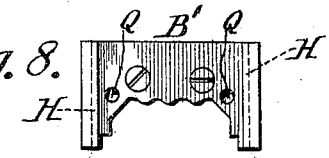
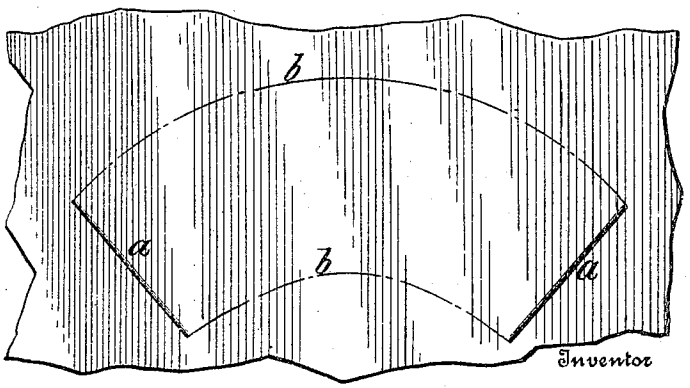



Fig. 10.




Inventor

Witnesses

L. Rouville,

P. H. Nagle.

Charles B. Agar.

By Wedderburn & Fairbank

Attorneys

No. 817,611. PATENTED APR. 10, 1906.

C. B. AGAR.

DIE FOR CUTTING OUT METAL PLATES.

APPLICATION FILED JAN. 26, 1906.

2 SHEETS—SHEET 2.

Fig. 2.

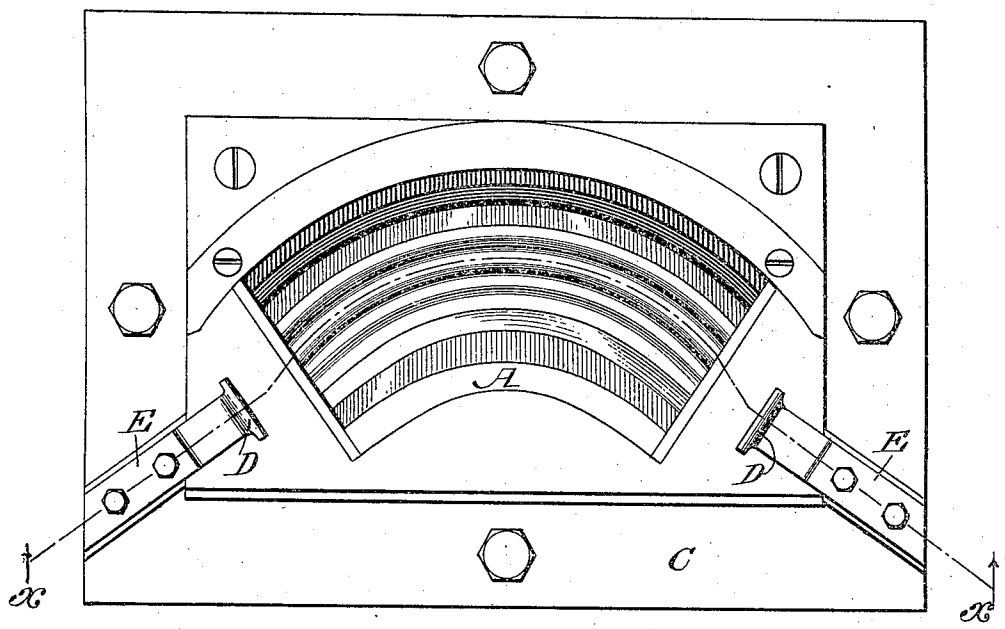
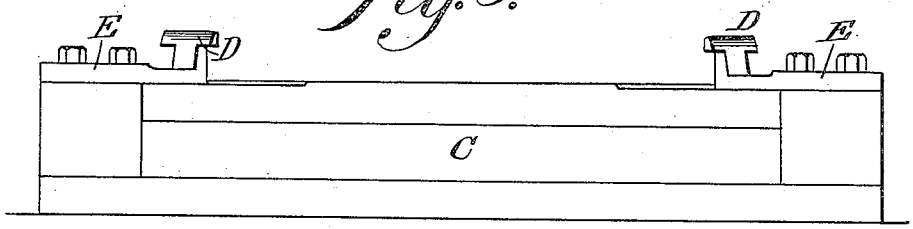



Fig. 3.



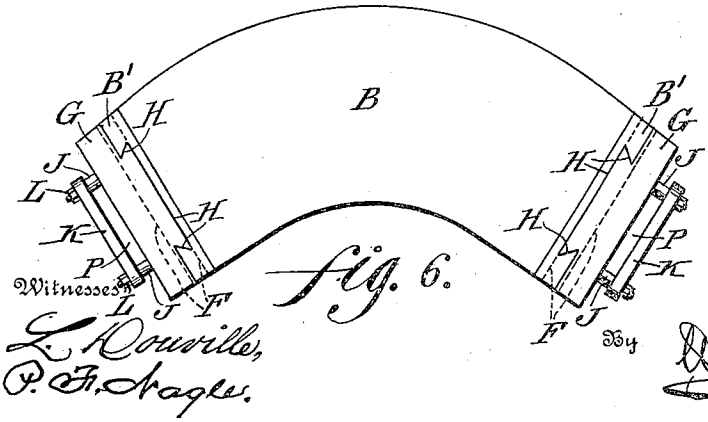
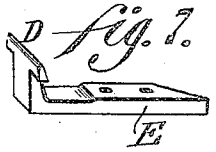




Fig. 6.

Fig. 7.




Witnesses:
L. Rouville,
P. F. Drages.

Inventor
Charles B. Agar.
By Dieterich & Fairbank
Attorneys

# UNITED STATES PATENT OFFICE.

CHARLES B. AGAR, OF CAMDEN, NEW JERSEY, ASSIGNOR TO BENJAMIN P. OBDYKE, OF PHILADELPHIA, PENNSYLVANIA.

## DIE FOR CUTTING OUT METAL PLATES.

No. 817,611. Specification of Letters Patent. Patented April 10, 1906.

Application filed January 26, 1906. Serial No. 298,010.

*To all whom it may concern:*

Be it known that I, CHARLES B. AGAR, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Die for Cutting Out Metal Plates, of which the following is a specification.

My invention consists of dies for cutting plates of metal, more particularly for elbows of sheet-metal spouts, conductors, &c., the same embodying opposite die members and means for primarily cutting portions of the plates or sheets in advance of similar action on other portions, thus preventing buckled and jagged edges and causing sharp and regular work, as will be hereinafter set forth.

Figure 1 represents a vertical section on line *x x*, Fig. 2, of cutting-dies embodying my invention. Fig. 2 represents a top or plan view of the bed member of the dies. Fig. 3 represents a side elevation thereof. Figs. 4 and 5 represent sections of detached portions showing certain parts in different positions. Fig. 6 represents a plan view of the top or follower member of the dies. Fig. 7 represents a perspective view of a cam employed. Fig. 8 represents a side elevation of an end member of the cutter. Fig. 9 represents a perspective view of one of the heads employed. Fig. 10 represents a diagrammatical view of the cutting operation.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates the bed member of the dies, and B the follower member thereof, the working faces of which members in the present case being corrugated or serpentine, as will be apparent in Figs. 1, 2, 8, and 9.

C designates the base on which said bed member is supported and to which it is fitted in any suitable manner. Rising from said base are the cams D, which, by means of the plates E, connected therewith, are firmly secured to said base and are arranged adjacent to the sides of the working faces of the bed member.

B′ designates the end plates of the follower member B, the same being slidably mounted on end cutters F, the latter being secured to heads G, said plates B′ being engaged with said cutters by dovetailed joints H, whereby said heads and cutters are vertically movable independent of the member B. Partially within and partially without said heads are the horizontally-arranged bolts J, which are adapted to move in opposite directions, they being mounted on the walls of said heads, the outer ends of said bolts having on them the cross-bars K, which are retained in place by the nuts L, said bars acting as shoulders on said bolts.

Bearing against nuts or shoulders M on the inner portions of the bolts J and fixed portions within the heads G are the springs N, whose tendency is to draw said bolts to their normal positions, as shown in Fig. 1, it being noticed that in said figure, as well as in Figs. 4, 5, and 6, the cross-bars K are set out from the heads G, so as to form passages P between said parts, the same being so located that when the heads descend the cams D are received within said passages and the inner walls of the cross-bars K ride against the outer face of said cams, said cams being inclined downwardly and outwardly, whereby the cross-bars are drawn laterally, and with them the bolts J, for purposes to be hereinafter explained.

In the outer faces of the end cutters B′ of the follower member are the sockets or openings Q Q, which are adapted to receive the inner ends of the bolts J, thus locking said follower member with the heads G, as shown in Fig. 1.

The operation is as follows: A sheet of metal is properly placed on the bed member A and downward motion imparted to the follower member and heads G by suitable portions of a press, which for the purpose of clearness are omitted from the drawings. As soon as the cross-bars K reach the cams D they engage with the same and draw the bolts J from the sockets or openings Q, thus disconnecting the heads from the follower member. The working faces of the end cutters F first reach the sheets (see Fig. 4) and so cut the ends of the shape or form of a plate, as shown at *a a*, Fig. 10, after which as the member B continues its descent to full extent (see Fig. 5) the side-cutting edges thereof reach the sheet, and so cut the remainder of the shape of the plate, as at *b b*, as also shown in Fig. 10. It will be seen that as the member B descends the sheet as cut is gradually lowered by the former to full extent, when the corrugated shape of the face of the dies is imparted to the cut-out plate.

As the ends *a a* of the shaped plate are primarily cut there will be regularity and uniformity in the same, thus avoiding the production of buckled and jagged edges, after which the sides *b b* of the plate will also be cut in a similar manner and with the same results on its edges. When the press rises, the follower and heads are elevated, and as the cross-bars K clear the cams D the springs N return the bolts J to their normal positions, when they enter the openings Q, and so again interlock the follower member and the heads, as at first. (See Fig. 1.)

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cutting-die of the character stated, a follower-die member, a head to which the latter is movably fitted, means for coupling said head and member and means for uncoupling the same.

2. In a cutting-die of the character stated, a follower-die member, a head thereon to which the latter is movably fitted and means for coupling said member with said head and for uncoupling the same and a cutter on said head, said cutter being movable independent of said follower member.

3. In a cutting-die of the character stated, a follower-die member and a head, a cutter on said head, means for coupling said member and head whereby they may advance in unison and means for uncoupling said member, whereby said cutter may advance independent of said follower-die member.

4. In a cutting-die of the character stated, a bed-die member, a follower-die member, a head adapted to be coupled to said follower-die member, a cam on said bed-die member and means on said follower-die member adapted to engage said cam, whereby said follower-die member may be disconnected from said head.

5. In a cutting-die of the character stated, a bed-die member, a head, means for coupling said member and head, a shoulder on said means, a follower-die member, and a cam on the latter adapted to engage said shoulder on the descent of said follower-die member and head, thus uncoupling said head and follower-die member.

6. In a cutting-die of the character stated, a follower member, a cutter-carrying head, a bolt in said head adapted to enter an end plate of said member, a bar on the outer portion of said bolt set out from said head, a cam and a base supporting the same, said cam being adapted to engage said bar on the descent of said member and thus withdraw said bolt from the latter.

7. In a cutting-die of the character stated, a follower member, a head, a bolt on said head adapted to engage said member, a spring bearing against said bolt to return the latter to its normal position, a bed member and a cam on the latter adapted to engage a shoulder on said bolt on the advance of said follower member and head, and thus disengage said bolt from said follower member.

CHARLES B. AGAR.

Witnesses:
JOHN A. WIEDERSHEIM,
S. R. CARR.