(No Model.) 3 Sheets—Sheet 1.

P. H. FONTAINE.

MACHINE FOR MAKING WROUGHT METAL BEARING BOXES.

No. 442,430. Patented Dec. 9, 1890.

Fig 1.

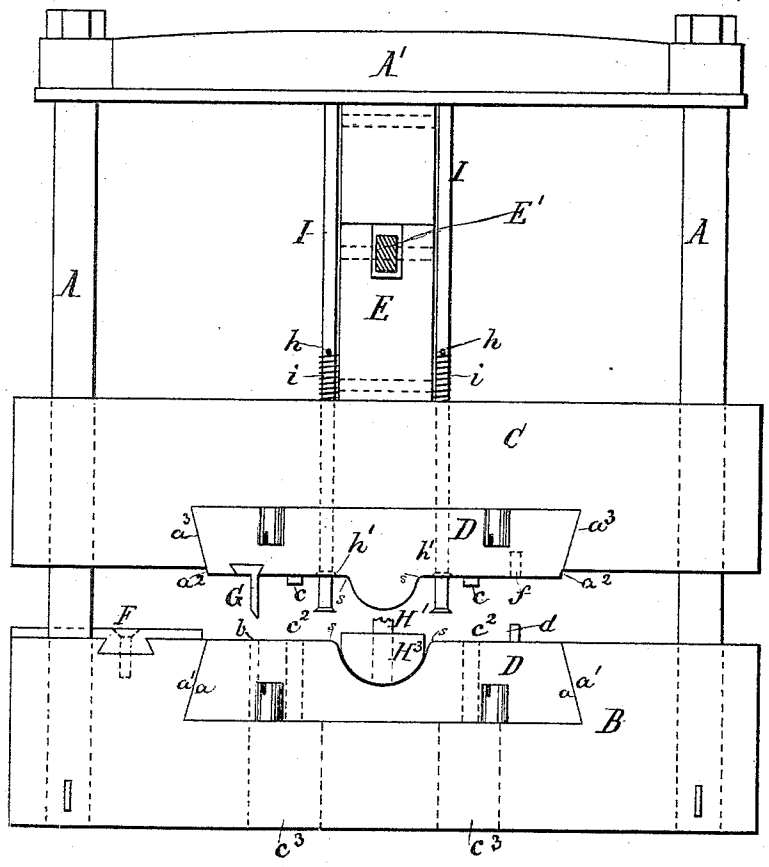
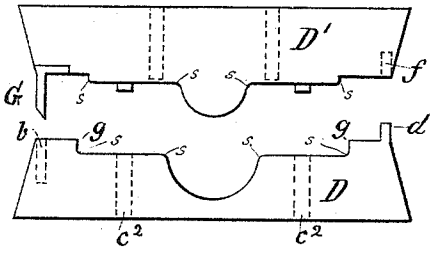


Fig 2.



Witnesses:
J. P. Theo. Lang
E. T. Fennick

Inventor:
Patrick H. Fontaine
by his Attorneys
Mason, Fennick & Lawrence

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

(No Model.) 3 Sheets—Sheet 2.

P. H. FONTAINE.

MACHINE FOR MAKING WROUGHT METAL BEARING BOXES.

No. 442,430. Patented Dec. 9, 1890.

Fig5.

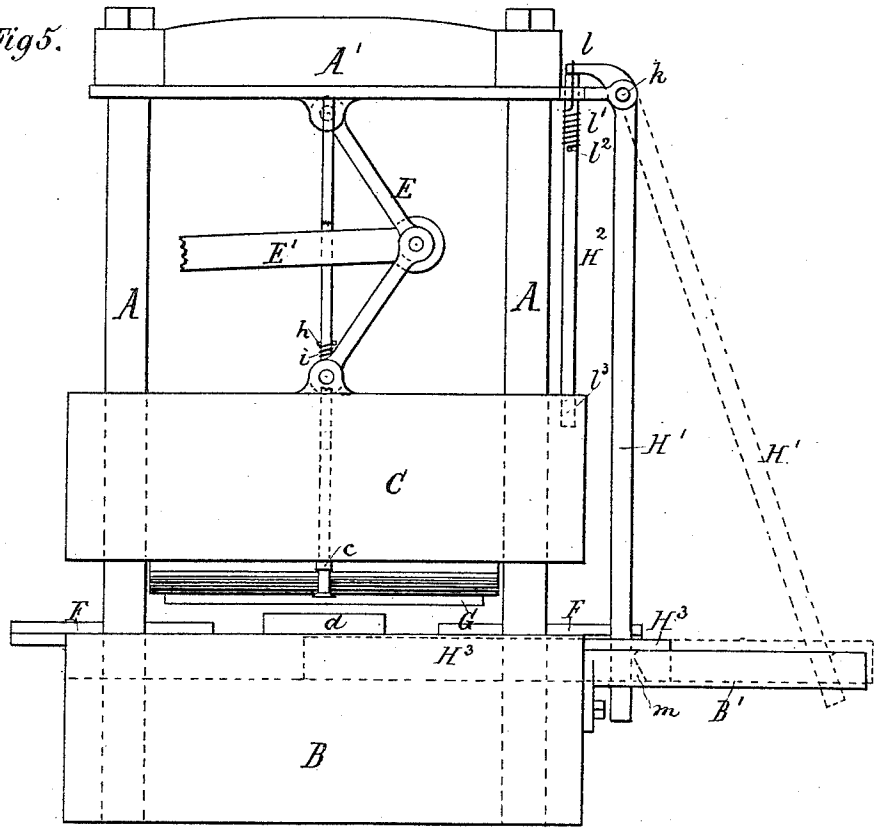
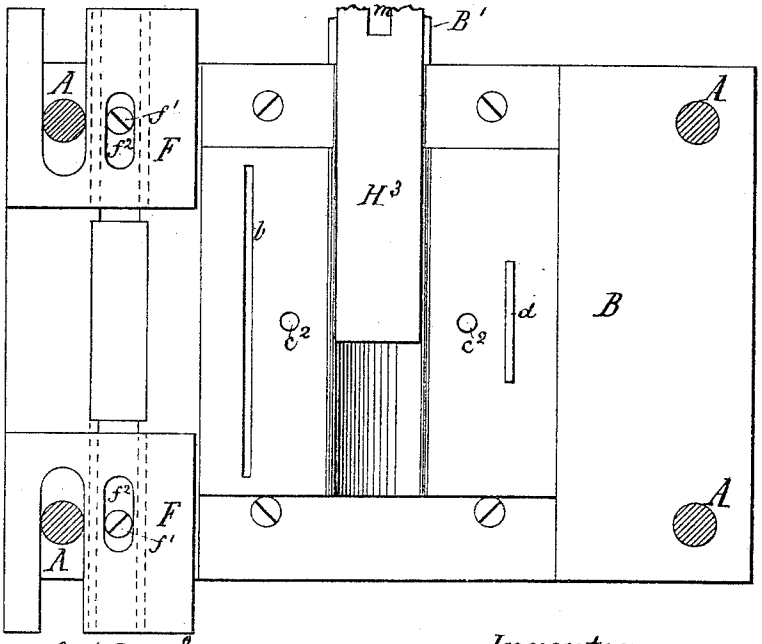


Fig3.



Witnesses: J. P. Thos. Lang, E. J. Fennick

Inventor: Patrick H. Fontaine by his Attorneys Mason, Fennick and Lawrence

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

(No Model.) 3 Sheets—Sheet 3.

P. H. FONTAINE.

MACHINE FOR MAKING WROUGHT METAL BEARING BOXES.

No. 442,430. Patented Dec. 9, 1890.

Fig 4.

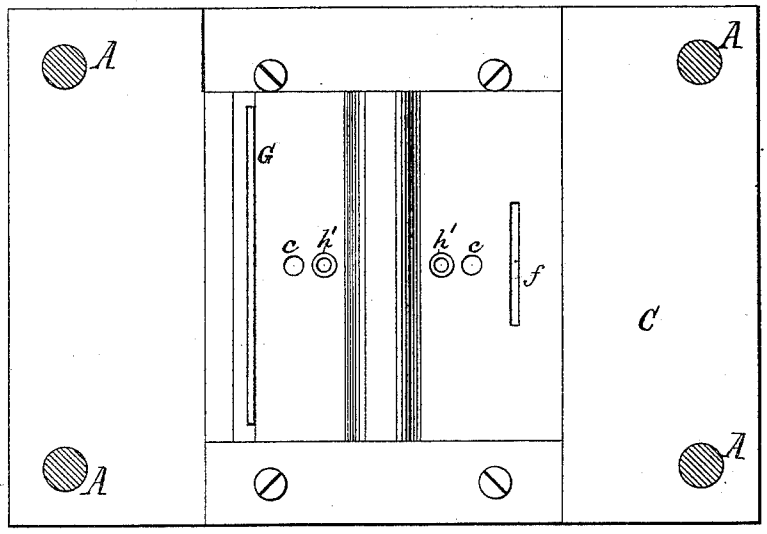


Fig 6.

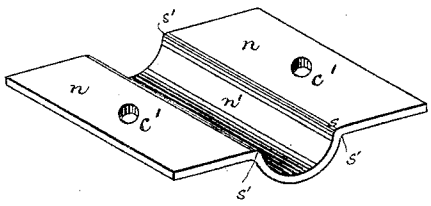
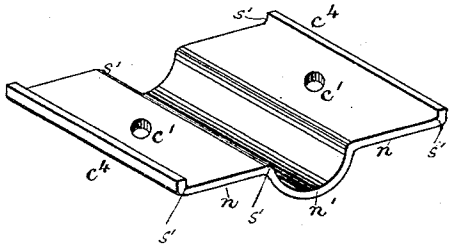


Fig 7.



Witnesses:
J. P. Theo. Lang.
E. J. Fennick

Inventor:
Patrick H. Fontaine
by Lisle Thomas
Mason, Fenwick and Lawrence

THE HORNIS-PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PATRICK H. FONTAINE, OF ELMO, VIRGINIA.

MACHINE FOR MAKING WROUGHT-METAL BEARING-BOXES.

SPECIFICATION forming part of Letters Patent No. 442,430, dated December 9, 1890.

Application filed April 16, 1890. Serial No. 348,186. (No model.)

To all whom it may concern:

Be it known that I, PATRICK HENRY FONTAINE, a citizen of the United States, residing at Elmo, in the county of Halifax and State of Virginia, have invented a certain new and Improved Machine for Making Wrought-Metal Bearing-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in certain combinations, arrangements, and constructions of mechanical elements whereby a simple and efficient machine is produced for expeditiously and cheaply making two-part bearing-boxes, in which the ends and intermediate portions of cylindrical shafts are arranged to revolve, the said boxes being made from either wrought-iron, steel, or malleable iron, or other suitable metal by swaging and punching operations.

In the accompanying drawings, Figure 1 is a side view of the machine; Fig. 2, a detail side view showing the upper and lower dies slightly modified in form on their shaping, cutting, and punching surfaces. Fig. 3 is a top view of the stationary bed-plate with female die, guiding gage-plate, and a portion of an ejector; Fig. 4, a bottom view of the upper plate with male die. Fig. 5 is an end elevation of the machine as it appears after the ejector has ejected a half bearing-box. Fig. 6 is a perspective view of one of the halves of the box made by the machine, one half only being shown, as the other is an exact counterpart of it; and Fig. 7 is a similar view of the lower half of the box as made by the machine when it has dies such as are shown in Fig. 2, said half having upturned flanges.

A A A A in the drawings indicate guide-standards, B a lower stationary bed or die holding plate, and A′ a cap-plate to which the standards are attached, as shown or in any suitable manner.

C is an upper movable die-holding plate fitted to slide straight up and down on the guides. In the lower plate a female die D is fitted by means of a dovetail formation a on the die and a dovetail slot a' formed in the plate and suitably secured, as shown; and in the upper plate a male die D′ is fitted by means of a dovetail formation a^2 on the die and a dovetail slot a^3 in the plate and suitably secured, as shown. The upper plate is connected to a toggle-lever E, which is fastened by one of its limbs to a central lug or lugs of the cap-plate A′ and by its other limb to a lug or lugs of the upper die-holding plate. This toggle-lever is operated by a connecting-rod E′ applied to its joint, and by gradually straightening the toggle the male die can be made to exert a gradual powerful swaging action upon metal placed between the male and female dies, and by bending the toggle to its normal position the male-die-holding plate with the die can be raised for a new operation. The toggle may be worked by hand or steam power. A cam, screw, or any other suitable means may be employed for operating the male die. On the bottom die-holding plate, at the front end of the machine, two slotted guiding gage-strips F F are arranged, being fitted in place by dovetail formations on the under sides of the plates and a dovetail slot in the bed-plate B, and confined in position by set-screws f', passed down through slots f^2. By moving these strips nearer together they will be adapted for guiding the narrower metal sheets from which the smaller boxes are to be formed, and by moving them farther apart they will be adapted for guiding wider sheets or strips from which larger boxes are to be formed.

On the upper die a cutter G is provided for cutting off pieces of metal of proper length for forming the respective halves of the boxes, and in the lower die a cutter-reception passage b is provided, so that the cutter G may pass into it and thus not be in the way when the male die comes down upon the female die. This die is also provided with punches c for punching screw-bolt holes c' in the halves of the boxes (see Figs. 6 and 7) produced by the machine. In the lower die passages for the entrance of these punches, and also the escape of the punchings, are provided, as indicated at c^2, and below these passages other larger or elongated passages c^3 are provided in the bed-plate B for the final escape of the punchings. The passages c^3 are elongated, in order to

adapt the bed-plate B for dies constructed for swaging larger boxes, which boxes require larger screw-bolt holes c'. Near the rear of the lower die a gage-stop d is provided for arresting the feed of the metal from which the box-halves are formed when it has been fed in a proper distance. In the upper die a recess f is provided for the reception of the gage-stop d when the upper die is brought down upon the lower die.

It is contemplated to make the halves of the boxes with flanges n and a depression n' either exact counterparts of one another, as in Fig. 6, or one half with the flanges n, depression n', and upturned flanges c^4, and the other without such flanges c^4, (see Figs. 6 and 7,) and if the latter construction is adopted the lower die will be formed with a depression or vertical shoulders g, and the cutters G, punches c', recess f, and the gage-stop d will be arranged as shown in Fig. 2. In either form of die it is essential to round off the corners at S, in order to avoid breaking the metal of the box-halves at S'.

In feeding in and cutting off the metal for the box-halves shown in Fig. 6 a sufficient allowance must be made for the deflection of the metal into a semicircular form at the middle of the pieces from which the box-halves are produced, and if the upturned flanges c^4 are to be made on the flanges n of the lower half of the box, as in Fig. 7, a still greater allowance must be made, as the metal pieces will be deflected not only from a straight line at the middle of their lengths to form the semicylindrical depressions, but also at their ends to form the flanges c^4.

In cases where boxes are made from metal which is quite thick the punches c' may be required to be substituted by punches extended entirely through the plate C and die D' and held up by springs until after the metal has been swaged into the form of a box-half and thereupon driven down by means of a hammer or hammers actuated by hand or automatic means.

For the purpose of discharging the swaged halves from the upper die D' when the plate C is lifted, two vertical discharging-bars I are passed down from the cap-plate A' through the plate C and die D', as shown. On these rods, between the top of the plate C and pins h in the rods, spiral springs i are arranged for the purpose of forcing the rods upward against the cap-plate A' and their lower flanged ends into cavities h', formed in the under surface of the die D', while the said plate is descending. The force of the springs i is overcome by the force of the toggle-lever during the act of raising the plate C and die D', and thus the rods retain the finished half-box beneath their lower ends while the plate and die are passing up beyond said ends, and the half-box is thus left in a position to be readily discharged from the machine.

For the purpose of discharging the finished half-boxes an ejector-rod H is provided at one side of the frame, being pivoted at k to the cap-plate A' thereof, as shown in Fig. 5. This ejector-rod has its long arm extended down through a slotted extension-plate B' of the stationary lower die-plate B, and its upper angular end l is extended over a vertical spring-rod H^2 and connected to the upper end of the same by means of a spiral spring l' and pin l^2, as shown in said Fig. 5. In a groove concentric with the semicircular depression in the die D a sliding bar H^3, which in transverse section is nearly semi-cylindrical, is fitted so as to have its discharging end occupy, normally, a position beyond the half-boxes while they are being formed or swaged in the machine. The rod H^2 is capable of sliding up and down in the plate A' and in a socket-recess l^3 formed in the upper die-plate C, as shown. It will be seen from Fig. 5 of the drawings that the normal position of the ejector-rod H' and the ejecting slide-bar H^3 is shown by dotted lines, and the position these parts occupy when the half-box has been ejected is shown by full lines.

The ejection of the finished half-boxes is effected as follows: The plate C in rising, after having performed its operation, comes in contact with the lower end of the sliding rod H^2, and causes said rod to press with its upper end against the under side of the angular short arm l of the ejector-rod H', and thereby cause the lower end of said ejector-rod to traverse the slot m in the ejecting slide-bar H^3, and strike forcibly said ejector-bar and thereby properly discharge a finished half-box at the opposite side of the machine. During this operation the spring l' is strained or compressed, and as soon as the plate C again begins to descend the said spring, acting downwardly upon the short lever-arm l, will cause the rod H' to fly outward to its normal position, shown by dotted lines, and thereby draw the ejector-bar H^3 to its proper position for again operating in the manner just described after another half-box is swaged and the plate C with its die D' are raised out of their swaging positions.

From the aforegoing specification it will be apparent that the two halves of a bearing-box, with or without upturned flanges c^4 c^4, can be made very rapidly from wrought metals, or other suitable metals, by a single swaging operation, and thus the manufacture of such boxes is greatly reduced in cost. Furthermore, the boxes being made of finer grades of metal than ordinary cast-iron, are much stronger and more suitable for bearing-boxes, as the surfaces of the same are much smoother and truer than boxes made of cast-iron.

In the manufacture of these boxes the metal for forming the halves might be cut into proper sizes before introduction into the machine, and if this is done the cutter and gage plates might be dispensed with; but it is far preferable to employ the cutter and gage

plates and cut the metal in its passage through the machine.

What I claim as my invention is—

1. In a machine for manufacturing bearing-boxes, the combination of the die D, having lateral horizontal surfaces and a semicircular or nearly semicircular depression formed in it, with the upper die D′, having lateral horizontal surfaces and a semicircular or nearly semicircular projection formed on it for the purpose of swaging wrought-iron, steel, malleable or other metal into flanged bearing-box halves, substantially as described.

2. The combination of the lower die D, having lateral horizontal surfaces and shoulders *g* and a semicircular or nearly semicircular depression formed in it, with the upper die D, having lateral horizontal surfaces and a semicircular or nearly semicircular projection formed on it for the purpose of swaging metal into bearing-box halves having flanges *n* and c^4, substantially as described.

3. The combination of the stationary plate B, provided with a lower die D, having a semicircular or nearly semicircular depression and two lateral horizontal surfaces, and the sliding plate C, carrying upper die D′, having a semicircular or nearly semicircular projection and two horizontal lateral surfaces, one of said dies being provided with a gage-stop pin *d* and a recess *b* and the other with a recess *f*, substantially as described.

4. The combination of the die-holding plate B, having discharging-passages c^3, die D, having recess *b*, discharging-passages c^2, and gage-stop *d*, gaging guide-plates F, the upper sliding die-holding plate C, and die D′, having cutter G, punches *c*, and recess *f*, substantially as described.

5. The combination, with the frame A A′ and die-plates C B, carrying dies D D′, of the vertical rods I, provided with pins *h* and springs *i*, substantially as described.

6. The ejector-rod H′, ejecting-bar H^3, and sliding rod H^2, in combination with the frame of the machine, moving die-plate C, carrying die D′, and the lower die-plate B, having die D, substantially as described.

7. The combination, with the frame of the machine, of the die-plates B C, dies D D′, the toggle-lever E, operating-rod E′, bars I, ejector-rod H′, ejecting-bar H^3, and sliding rod H^2, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

PATRICK H. FONTAINE.

Witnesses:

B. C. FENWICK,

J. P. THEO. LANG.