

(No Model.)

4 Sheets—Sheet 1.

W. HESLOP.

MACHINERY FOR PRESSING OR STAMPING BOATS FROM SHEET METAL.

No. 504,878.

Patented Sept. 12, 1893.

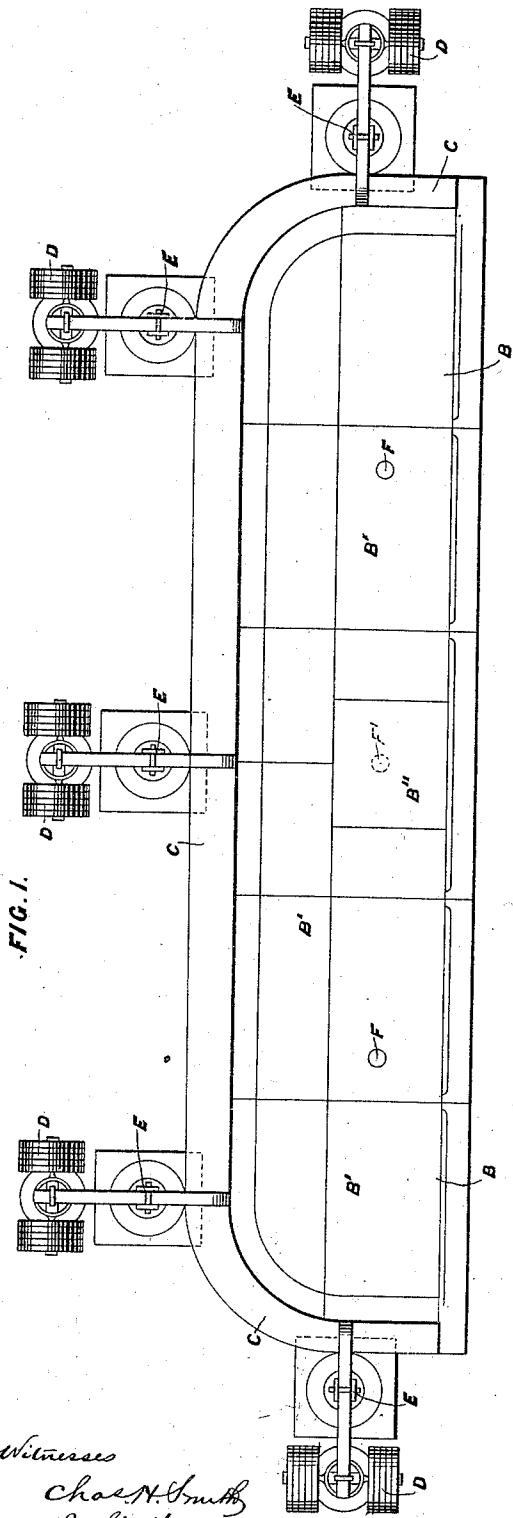


FIG. 1.

Witnesses
Chas. N. Smith
J. Stair

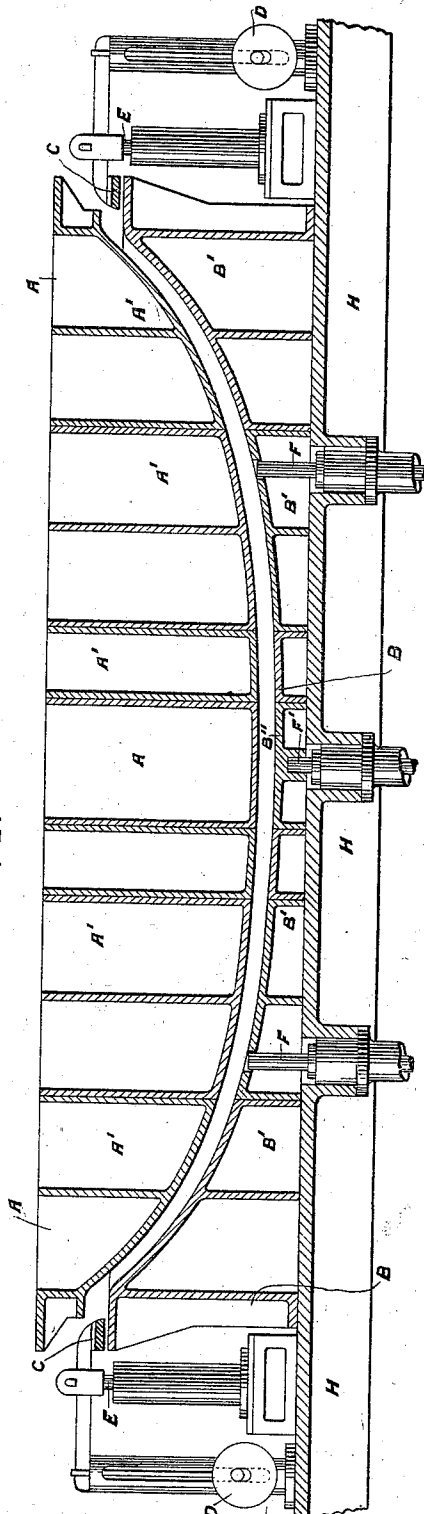


FIG. 2.

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per Lemuel W. Serrell *Inventor*

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FIG. 5.

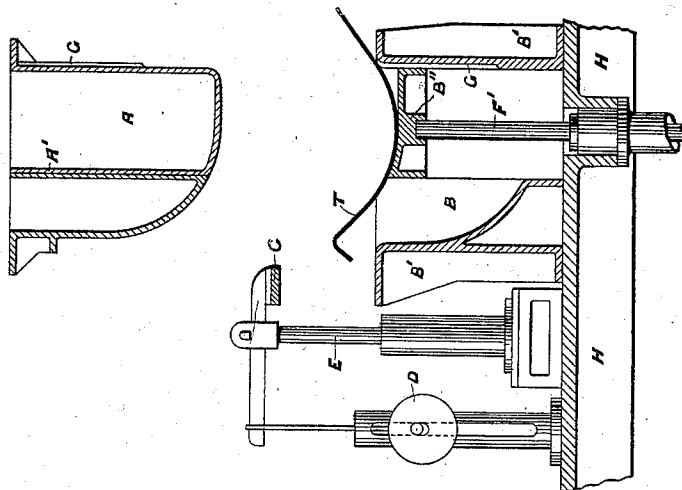


FIG. 4.

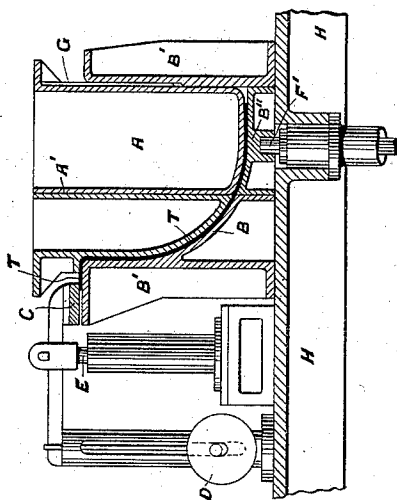
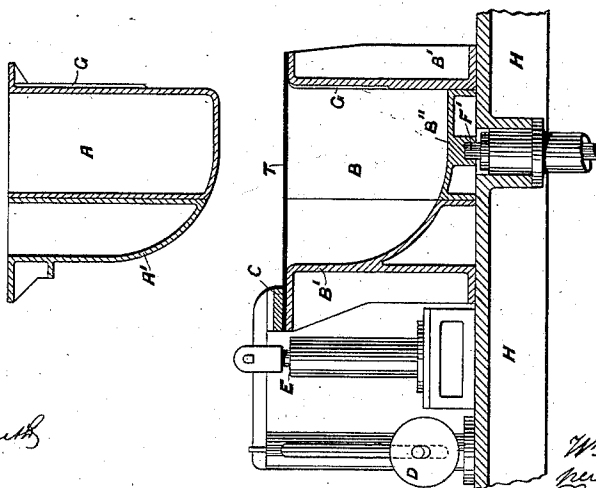


FIG. 3.



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Lemuel W. Lovell
Att'y

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FIG. 8.

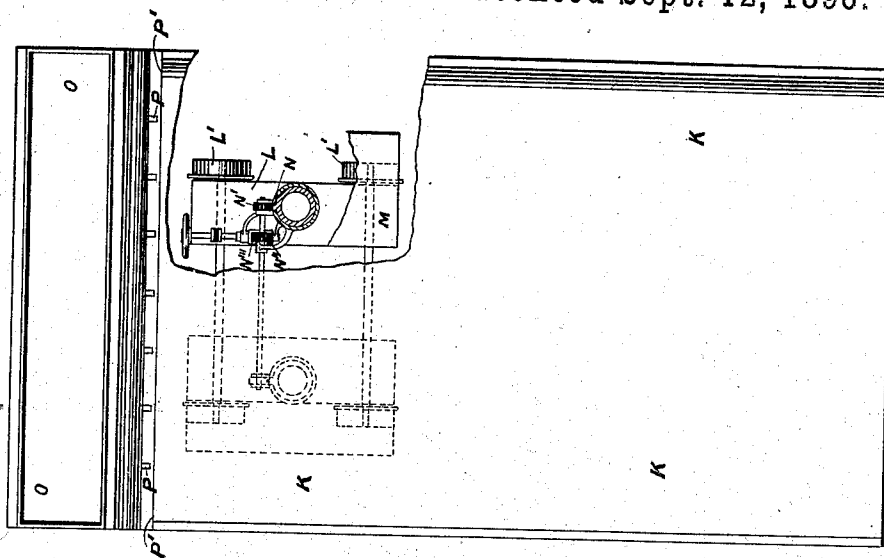
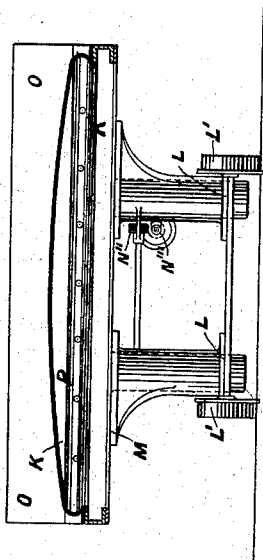
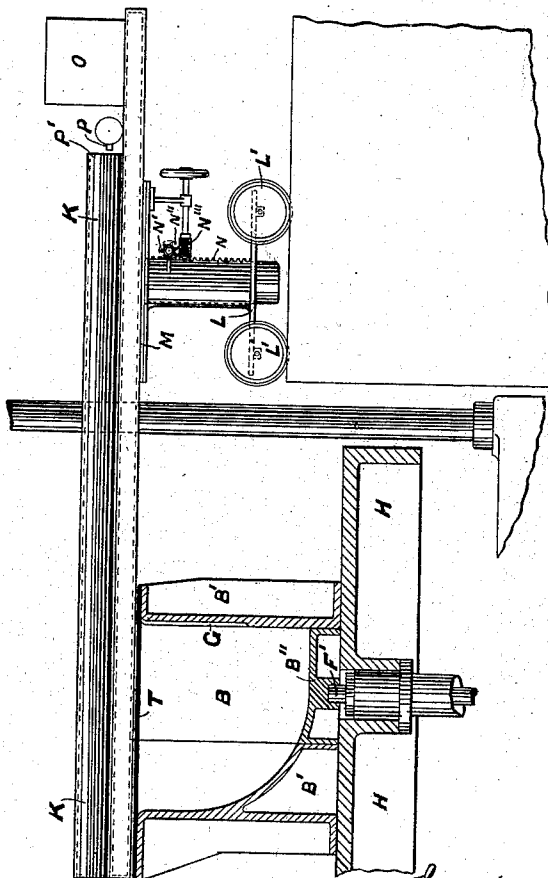


FIG. 6.



Witnesses
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FIG. 7.



Inventor
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Per Lemuel W. Perrell Atty

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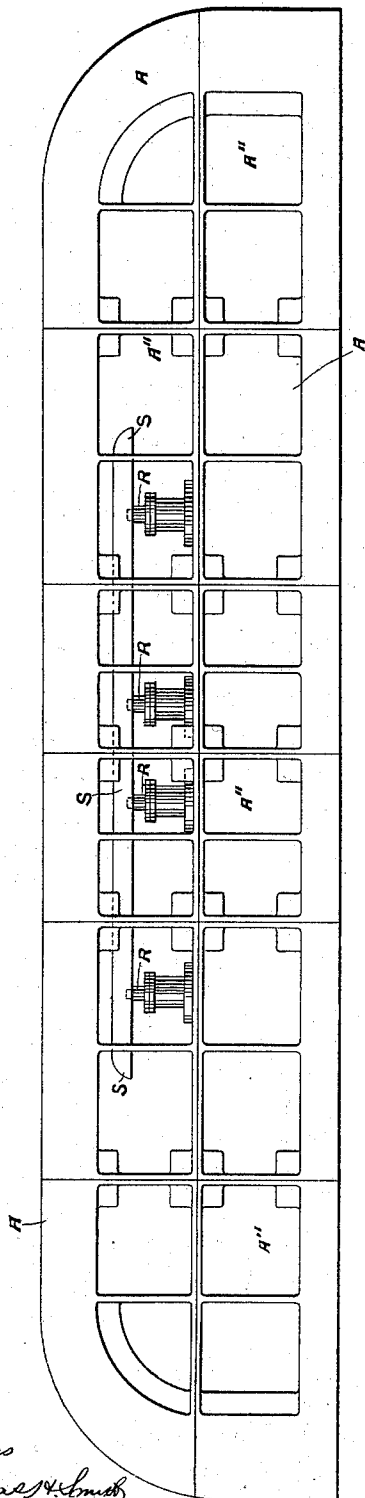
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FIG. 9.



Witnesses
Charles Smith
J. Strait

FIG. 11.

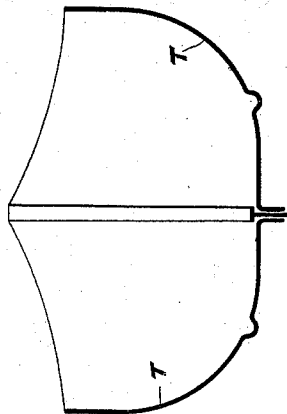
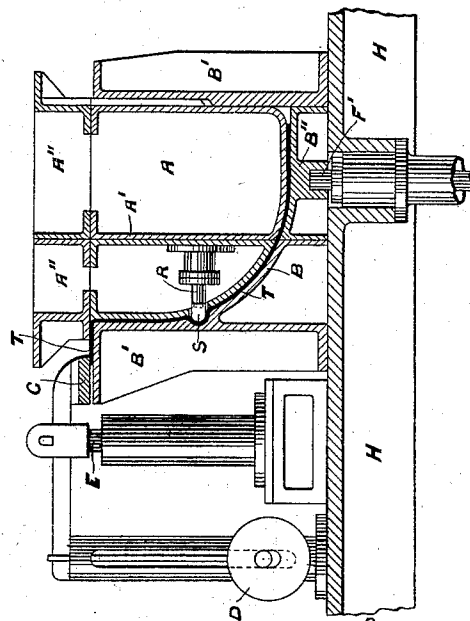


FIG. 10.



Inventor
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Atty

UNITED STATES PATENT OFFICE.

WILLIAM HESLOP, OF WAKEFIELD, ENGLAND.

MACHINERY FOR PRESSING OR STAMPING BOATS FROM SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 504,878, dated September 12, 1893.

Application filed May 10, 1893. Serial No. 473,666. (No model.) Patented in England March 18, 1892, No. 5,391; in France April 4, 1892, No. 198,821; in Germany April 7, 1892, No. 65,392; in Belgium April 12, 1892, No. 99,200; in Italy May 12, 1892, No. 31,862, and in Canada July 27, 1892, No. 39,498.

To all whom it may concern:

Be it known that I, WILLIAM HESLOP, a subject of the Queen of Great Britain, residing at Wakefield, in the county of York, England, have invented certain new and useful Improvements in Machinery for Pressing or Stamping Boats from Sheet Metal, (for which patents have been granted me as follows: in Great Britain, dated March 18, 1892, No. 5,391; in France, dated April 4, 1892, No. 198,821; in Germany, dated April 7, 1892, No. 65,392; in Belgium, dated April 12, 1892, No. 99,200; in Italy, dated May 12, 1892, No. 31,862, and in Canada, dated July 27, 1892, No. 39,498,) of which the following is a specification.

The object of my invention is to develop the machinery connected with the manufacture of boats when such boats are made in separate halves, from sheet metal.

According to my invention I employ an upper or male die, and a lower or female die, such dies being made up of any required number of sections in accordance with the required size and shape of the boat to be produced, each die when so built up corresponding in form to the general configuration required to be imparted to the metallic plates necessary for the formation of seamless boat sides, such sections being bolted together in any suitable way. With these upper and lower dies I combine a movable lower section or sections, actuated by hydraulic or other rams, for extracting the finished half boat from the press or for supporting the plate. I also employ a holding down plate for preventing buckling during the pressing operation, together with auxiliary plungers for producing ribs in the plates, and in order that my invention may be fully understood and carried into effect, I will proceed to describe same with reference to the accompanying drawings in which similar letters refer to like parts in all the figures.

Figure 1 is a plan of the lower die and holding down plate constructed according to my invention for the purpose of pressing the whole side or one half of a boat out of one sheet of metal. Fig. 2 is a longitudinal section showing the upper die with the lower die and holding down plate raised and almost

closed upon such upper die. Fig. 3 is a cross section of the dies and plate in position ready to be pressed. Fig. 4 is a similar view showing the lower die raised and the plate pressed to the shape required. Fig. 5 is a similar view showing the lower die lowered to its normal position, and the half boat lifted out ready for removal. Figs. 6, 7 and 8 are respectively a transverse section, side view, and part sectional plan, of heating apparatus for heating the plate and dies. Fig. 9 is a plan of the upper die fitted with an arrangement for forming a rib or corrugation in the boat side. Fig. 10 is a section of same showing the plate pressed and the rib or corrugation formed by the plungers or rams, and Fig. 11 shows in section a boat constructed of two sides or halves which have been previously formed in the dies.

I take the plate T of metal which is to be pressed to the shape of one half of a boat, and heat the same in a suitable furnace, and the plate thus heated is laid on the lower die B as at Fig. 3, ready to be pressed into shape, or the plate of metal to be pressed may be laid on the lower die B and then heated by a movable gas furnace, Figs. 6, 7 and 8, having a combustion chamber K consisting of an arch made of metal or other suitable material, and having the interior lined with fire-clay. The number of combustion chambers employed depends upon the size of plate or dies to be heated, so it is obvious that more than one may be employed. This gas furnace may be attached to or hung from the press, or it may be mounted on a truck L carried on wheels L' running on rails or on the ground or floor.

The furnace proper, which necessarily projects beyond the truck L, may be counterbalanced, for example, by an overhanging weight chamber O, and the whole furnace may be raised and lowered at will relatively to the truck upon which it is carried, by means of a rack N and pinion N' actuated by a worm wheel N'' and worm N''', which latter may be operated in any suitable manner. Gas and air being admitted to the combustion chamber K and ignited, a very hot flame is produced, which when brought over

the plate T to be pressed heats the latter very quickly, or the plate may be heated in a separate furnace and by the movable gas furnace. P and P' are the gas and air inlets respectively, or the gas and air may be previously mixed together and ignited at P.

In order to prevent the edges of the plate T from buckling during the pressing operation, I employ a rim or holding down plate C, which latter holds or guides the plate T during the pressing operation. The holding down plate C is of a shape to conform to the upper edges of the lower die B' and it is fastened to the ends of levers fulcrumed on the upper extremities of hydraulic rams E. and there are weights D. at the other extremities of the levers. The holding down plate C can be raised and lowered by means of the hydraulic rams E and held down with any required pressure. The weights D. tend to balance the weight of the plate C. so that the same can be lifted bodily together with the weights by the hydraulic rams, and when the rams are actuated to hold down the plate C. the outer ends of the levers rest upon the columns that form guides for the weights D. the rams pulling the plate C. down through the agency of the levers. The upper or male die A is stationary; the lower or female die B with its supporting table is movable.

In order to support the plate to be pressed before the pressing operation, and also for the purpose of removing or pushing out the pressed half boat, I provide a ram F' situated in the lower or moving table H of the press, which ram F' is attached to a section or sections of the die, which can be brought up at will either for the purpose of supporting the plate, or for pushing out the half boat when finished; and I also provide rams F, to aid in supporting the plate and the extraction of the pressed half boat.

The plate may be pressed to the required shape in one operation, or the plate may be reheated as often as required, and while hot subjected to a further pressing or stamping operation or operations, whereby the required formation of the plate is eventually produced.

Distance pieces G are employed for the purpose of keeping the dies up to their work after the lower or female die has half inclosed the male die, as hereinafter mentioned during the description of the action of the apparatus. Plungers or rams R Figs. 9 and 10 situated in the upper or male die are employed, carrying on their ends a bar S which is free to pass sidewise through the side of the upper die, and opposite this bar S when the lower die is in the raised position, is a corresponding recess or aperture in said lower die, the said recesses and bar being so formed and situated, that on the plate being pressed between the two dies, and the plungers or rams R being forced outward, the bar indents the pressed plate, leaving a rim or corrugation in same as shown at Fig. 10, and in the finished boat as shown at Fig. 11. The upper die is

made in upper and lower sets of sections as at Fig. 10, which renders the sections respectively lighter and more easily manipulated, and the sections thus made are bolted together through or by lugs.

The action of the apparatus according to my invention is as follows: The upper or male die A formed of sections A' is fixed to the stationary head of a hydraulic or other press, and the lower or female die B formed of sections B' is mounted on the rising table H of such press, and in order to impart the desired form or shape to the plates, each plate T is placed upon the lower die B ready for the pressing operation, the said plate being supported by rams F and section B'', all as aforesaid, but before the plate T is pressed into shape I heat same, while on the said die B by the movable gas furnace (Figs. 6, 7 and 8) which is placed over said plate as shown at Fig. 7, or the plate may be heated in a separate furnace, or a separate furnace and the gas furnace may be employed one after the other. The dies employed for pressing the plate are heated by the gas heating apparatus to any required extent before the operation of pressing and thus prevent chilling of the metal during such operation. The plate being now properly heated, the gas furnace is moved away and the holding down plate C is then brought down by the hydraulic or other rams E onto the plate T as shown at Fig. 3, which holds the edge down with any desired pressure. The rams F being then lowered, the latter having been previously supporting the plate, the table H is raised and the upper or male die A commences to enter the lower or female die B, taking with it the plate T, such plate T being forced down into the lower die B. The dies fit one another excepting at the entrance of the male into the female die, there is a clearance space between the straight faces of the two dies, because when the upper die first enters the lower die and takes the plate with it, the upper die has the plate extending up its curved side, and also a short distance up its straight side, and the aforesaid clearance at this time allows of the entrance into the female die of these two thicknesses of plate. As the lower die ascends the part of the plate lapping the straight side is drawn under the upper or male die, leaving only the opposite or curved side of the plate and the upper die, to fill the width of the lower. It is at this time that the distance pieces or projections G come into operation and occupy the clearance space which exists between the two dies, thus preventing any sidewise motion between the two dies. The plate being pressed is during the operation being gradually withdrawn from under the holding down plate C, whereby said plate is prevented from buckling as it is being pressed into shape, and on the table H reaching the position shown at Fig. 4, the plate T is pressed or stamped to the required shape and ready for removal. The table H is

now lowered into its normal position and the holding down plate C is raised on its rams E, when the pressed plate forming the half boat is pushed out of the lower die B by raising the sections B'', and if necessary the rams F, whereby such pressed plate or half boat is raised clear of the die B as shown at Fig. 5. Should it be desired to make a rib or corrugation in and along the side of the boat, the rams R are moved forward when the dies are together carrying with them the bar S which passes through an aperture in the side of the upper die A, and presses the plate T into a recess or longitudinal slot in the lower die B as shown at Fig. 10, thus forming the desired rib therein or thereon.

In making up a boat two of the plates T stamped or pressed as above described, are placed together, having a keel between them, to which such plates are welded or riveted, thus forming a complete boat as shown at Fig. 11.

I claim—

1. In machinery for the pressing of metal plates for the manufacture of boats therefrom the combination with an upper sectional male die, of a lower sectional female die, a movable section B'' located on and forming part of the base of the female die; ram F' for actuating the movable section B'' for supporting

the plate; a longitudinal rod S carried by the upper die and rams R for actuating same, a groove in the female die for receiving the rod S for forming grooves in the pressed plate, a rim C acting on the upper edge of the plate being pressed for holding same in position; arms for carrying the rim or holding down plate C; weights D and connecting rods for retaining the ends of the rim arms, and rams E for raising and lowering the rim C, together with distance pieces G on the upper die and corresponding recesses on the lower die for maintaining the die in proper relative positions as set forth.

2. The combination in machinery for pressing sheet metal boats with the upper die, of a lower die having a movable section, means for raising and lowering such section for sustaining the sheet when placed in position and for lifting out the pressed boat section, a holding down plate for the edge of the boat sheet while being pressed and means for actuating the dies and the holding down plate, auxiliary rams and a bar for producing a longitudinal rib in the boat section substantially as specified.

WILLIAM HESLOP.

Witnesses:

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JOHN JOWETT.