(No Model.) 3 Sheets—Sheet 1.

A. WILSON.

APPARATUS FOR THE MANUFACTURE OF ARMOR PLATE.

No. 381,453. Patented Apr. 17, 1888.

FIG. 1.

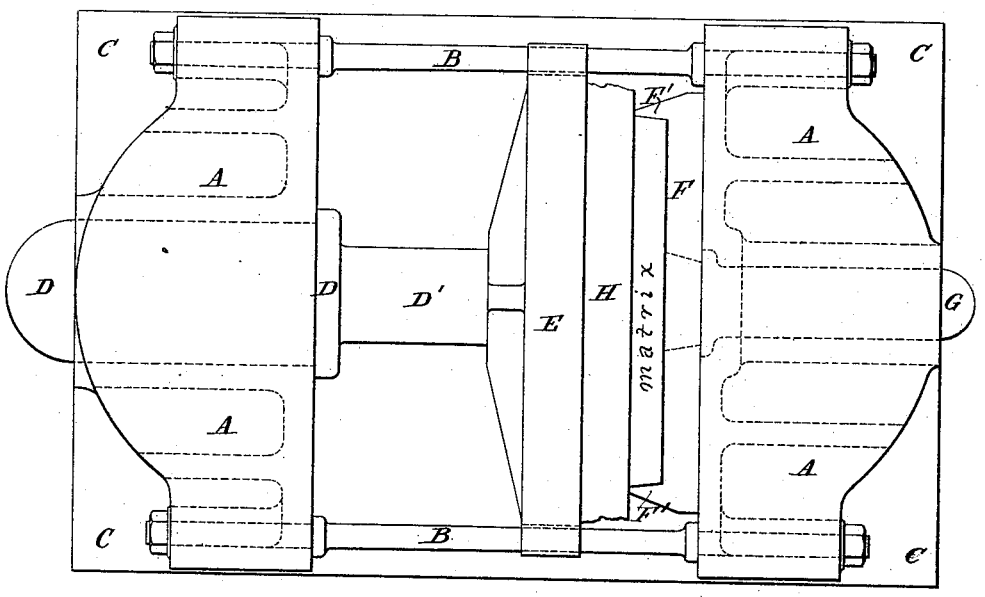
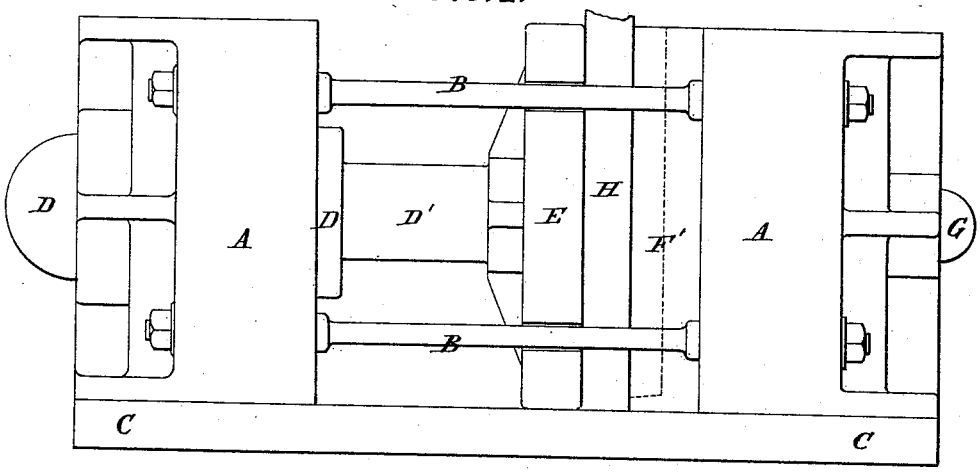


FIG. 2.



Witnesses.
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Baltus D. Long.

Inventor.
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(No Model.) 3 Sheets—Sheet 2.

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FIG. 3.

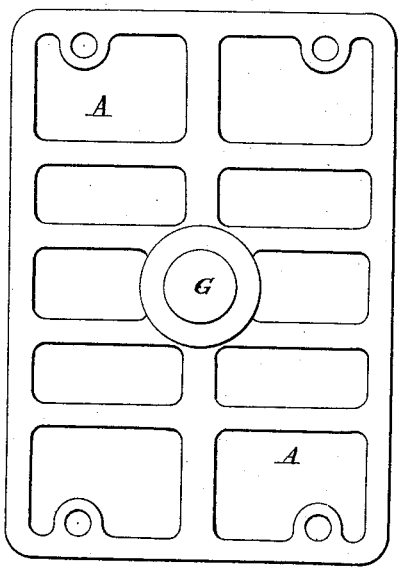
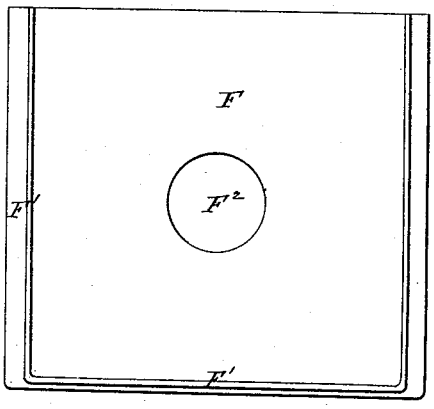


FIG. 4.



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(No Model.) 3 Sheets—Sheet 3.

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FIG. 5.

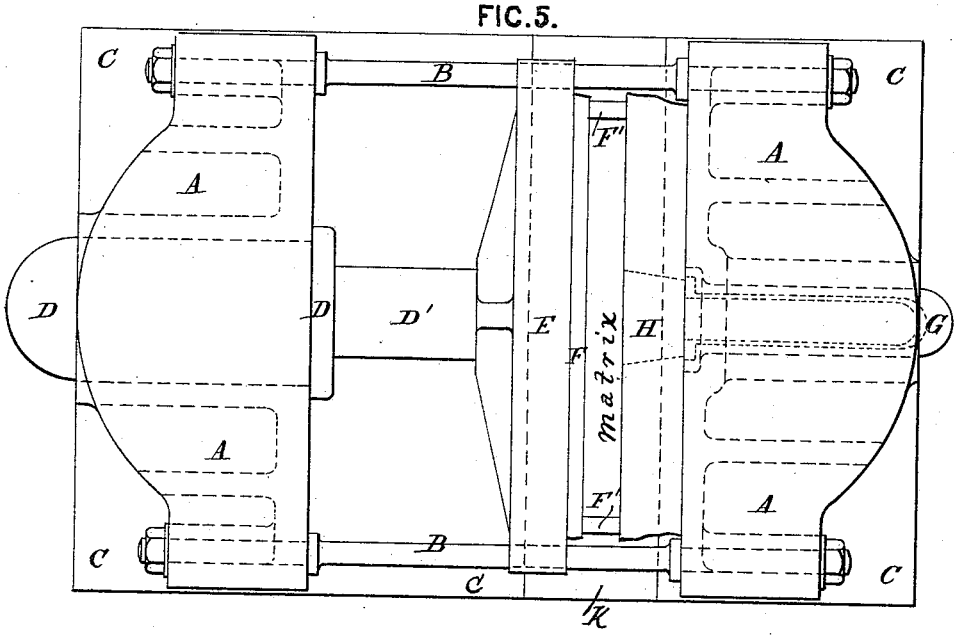
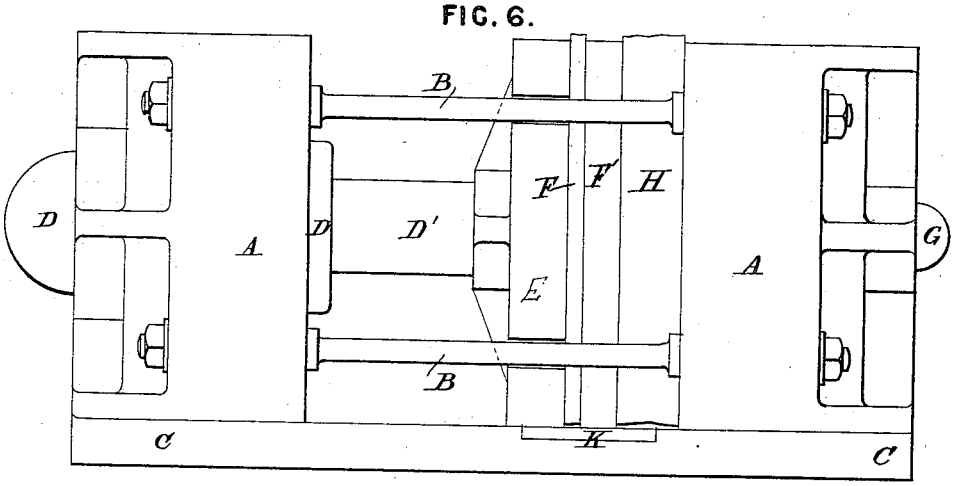


FIG. 6.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALEXANDER WILSON, OF SHEFFIELD, COUNTY OF YORK, ENGLAND.

APPARATUS FOR THE MANUFACTURE OF ARMOR-PLATES.

SPECIFICATION forming part of Letters Patent No. 381,453, dated April 17, 1888.

Application filed April 9, 1887. Serial No. 234,260. (No model.) Patented in England May 5, 1882, No. 2,130; in France May 23, 1882, No. 149,126, and in Belgium May 24, 1882, No. 58,010.

To all whom it may concern:

Be it known that I, ALEXANDER WILSON, a subject of the Queen of Great Britain, residing at Sheffield, in the county of York, England, steel-manufacturer, have invented certain new and useful Improvements in Apparatus for the Manufacture of Armor-Plates, (for which patents have been obtained in Great Britain, dated May 5, 1882, No. 2,130; in France May 23, 1882, No. 149,126, and in Belgium May 24, 1882, No. 58,010,) of which the following is a specification.

In the manufacture of armor-plates I take a wrought-iron plate immediately it has been rolled down to the desired thickness; but instead of putting it into a complete mold and then running onto it molten steel, so as to give to it a steel facing, as described in an application, No. 234,258, for a patent made by me and bearing even date herewith, I make the plate itself from one side of the upright or approximately upright mold, and for this purpose I hold the plate firmly and upright, or nearly so, by a powerful press against ribs or bars projecting from the front of a cast-iron mold-plate or in front of another heated plate. The ribs or bars are of such a depth as is required for the thickness of the steel about to be run onto the wrought-iron plate, and extend along the bottom and two sides of the plate or along the two sides only. The space left between the plates forms a mold open at the top, into which molten steel is then run. After the steel has "set," I push the now compound plate from the mold by means of a hydraulic ram fixed behind the mold-plate, then reheat the compound plate, and roll it off to any desired thickness. This I consider important, as it enables me to release the compound plate from the mold with as little delay as possible, thereby saving a great amount of heat by being able to put the compound plate into the reheating-furnace as speedily as possible previous to rolling it off to the finished dimensions.

The press for holding the plates together I form of two vertical blocks or bolsters held together at a distance apart from one another by wrought-iron stay-bolts. Against the face of one of the blocks is held the cast-iron mold-plate, or one of the heated plates if two heated plates are used. The other block carries at its center a screw or hydraulic ram, by which a strong flat plate can be moved to and fro between the blocks and made to clamp together the plates and bars which are placed between them.

In the accompanying drawings, Figures 1, 2, 3, and 4 show the way of forming the mold when a mold-plate is used, and Figs. 5 and 6 show the way of forming the mold when the molten steel is to be cast between two heated plates. Fig. 1 is a plan, and Fig. 2 a side elevation, of the mold complete. Fig. 3 is a back view of the block or bolster against which the mold-plate is supported, and Fig. 4 is a face view of the mold-plate. Fig. 5 is a plan view, and Fig. 6 a side elevation, of the mold when no mold-plate is used.

In Figs. 1, 2, 3, and 4, A A are two cast blocks or bolsters connected together at a distance apart from one another by tie-bolts B, both bolsters resting on and being secured to a bed-plate, C. One bolster A carries a hydraulic cylinder, D, the ram D′ of which has secured in front of it a cast-iron plate, E. The other has held in front of it the mold-plate F, from which ribs F′ project forward at its bottom and two sides. These ribs may either be formed in one piece with the mold-plate, as shown, or they may be separate therefrom. The bolster against which the mold-plate F is held also carries at its center a hydraulic cylinder, G, the front end of the ram of which bears against a loose portion of the mold-plate F, (marked F^2.)

H is the wrought-iron backing-plate, which is to be faced with steel. As it comes from the rolling-mill, it is suspended from a crane by tongs and lowered in front of the mold-plate F. The plate E is then pressed forward against it by the ram D, and it is thereby held firmly against the edges of the ribs which project from the mold-plate. The drawings show the plate H as being thus forced against the ribs F′ of the mold-plate F. When thus held, steel is poured into the cavity between it and the mold-plate. After the steel is set, both of the rams of the two hydraulic cylinders are simultaneously moved in a direction to carry the compound plate away from the mold-plate

F. The plate can then be taken hold of by tongs in the ordinary manner and lifted away by a crane to convey it to a reheating-furnace, and when reheated it is subsequently rolled down to the dimensions required.

In place of the hydraulic cylinders D and G, strong screws might, as before stated, be used to effect the same objects; but I prefer to use hydraulic cylinders, as shown in the drawings.

In Figs. 5 and 6 the parts are marked with the same letters of reference as in the preceding figures.

The thick backing-plate H is shown to be placed against the bolster A instead of the mold-plate, and a thinner heated plate, F, is held by the cast-iron plate E up to and against the ribs or bars F′. The plate F may be a heated plate of wrought-iron or steel rolled simultaneously with the backing-plate. The heated backing-plate H would first be set up in front of the bolster A. The heated plate F is then put in front of the movable plate E, and when the two bars F′ have been inserted between the plates H and F the whole is clamped together by forcing forward the plate E, and the mold is ready for the molten steel to be poured into it. The bed-plate C in this case forms the bottom of the mold. Its face, where it is thus exposed to wear, may be covered with ganister, or have a readily removable and renewable strip of refractory material or metal let into it, as at K, Fig. 6.

What I claim is—

1. The combination of the bolsters, the plate E, the press for actuating said plate, and the plate and ribs F F′, substantially as and for the purpose set forth.

2. The combination of the bolsters A, the tie-bars B, the plate E, moved to and fro between the bolsters by the ram of the press D in one of the bolsters, the plate and ribs F F′, and the plate H, substantially as and for the purpose set forth.

3. The combination of the bolsters A, the tie-bars B, the press D, the plate E, the plate and ribs F F′, the movable part F^2 in the plate F, and the press G, adapted to operate upon said movable part, substantially as and for the purpose set forth.

ALEXANDER WILSON.

Witnesses:

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CHARLES RENSHAW,

Clerks to Messrs. Burdekin & Co., Solicitors, Sheffield.