No. 612,610. Patented Oct. 18, 1898.

L. LÉVY.

PROCESS OF POURING METAL INGOTS.

(Application filed Jan. 6, 1897.)

(No Model.) 4 Sheets—Sheet 1.

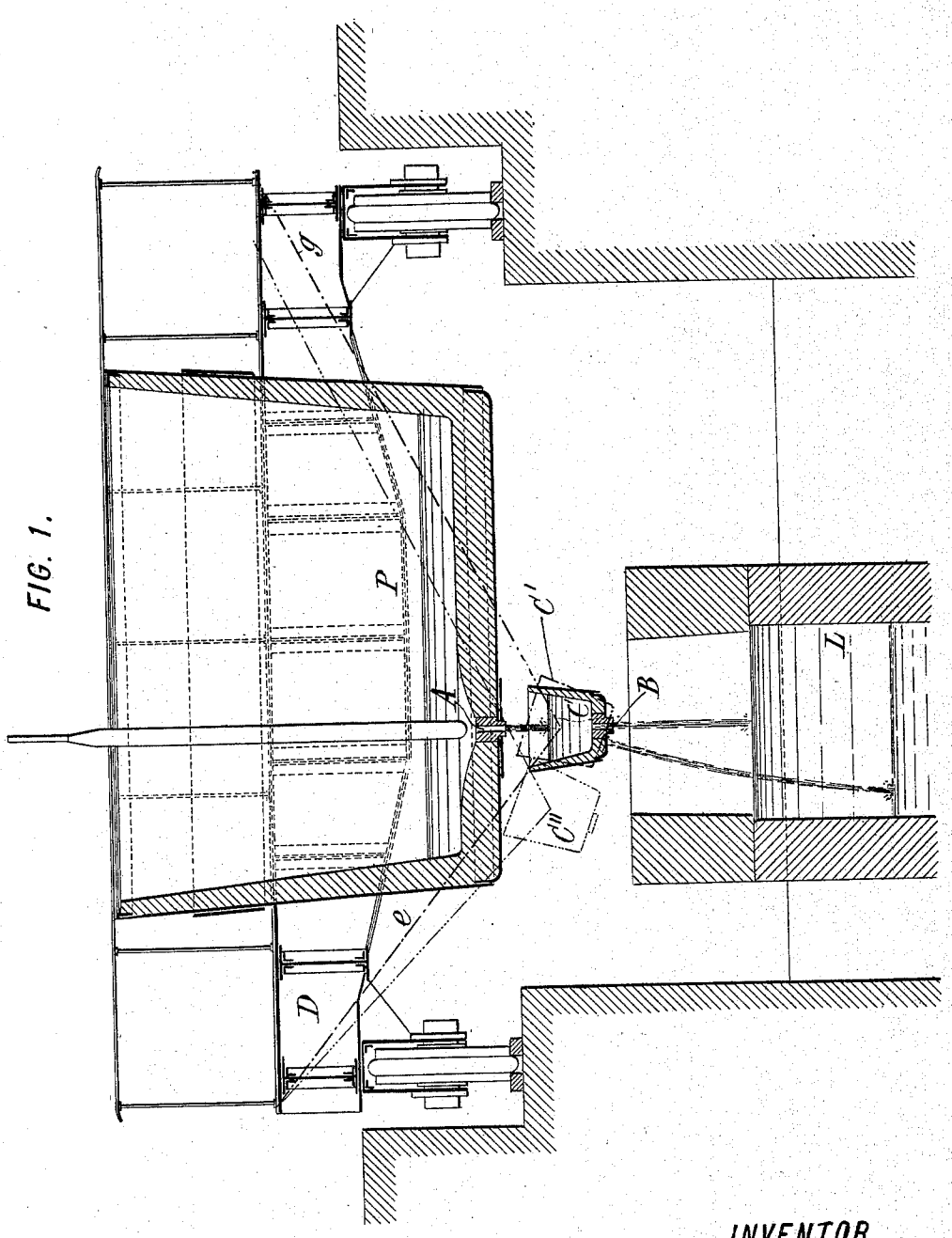


FIG. 1.

WITNESSES.

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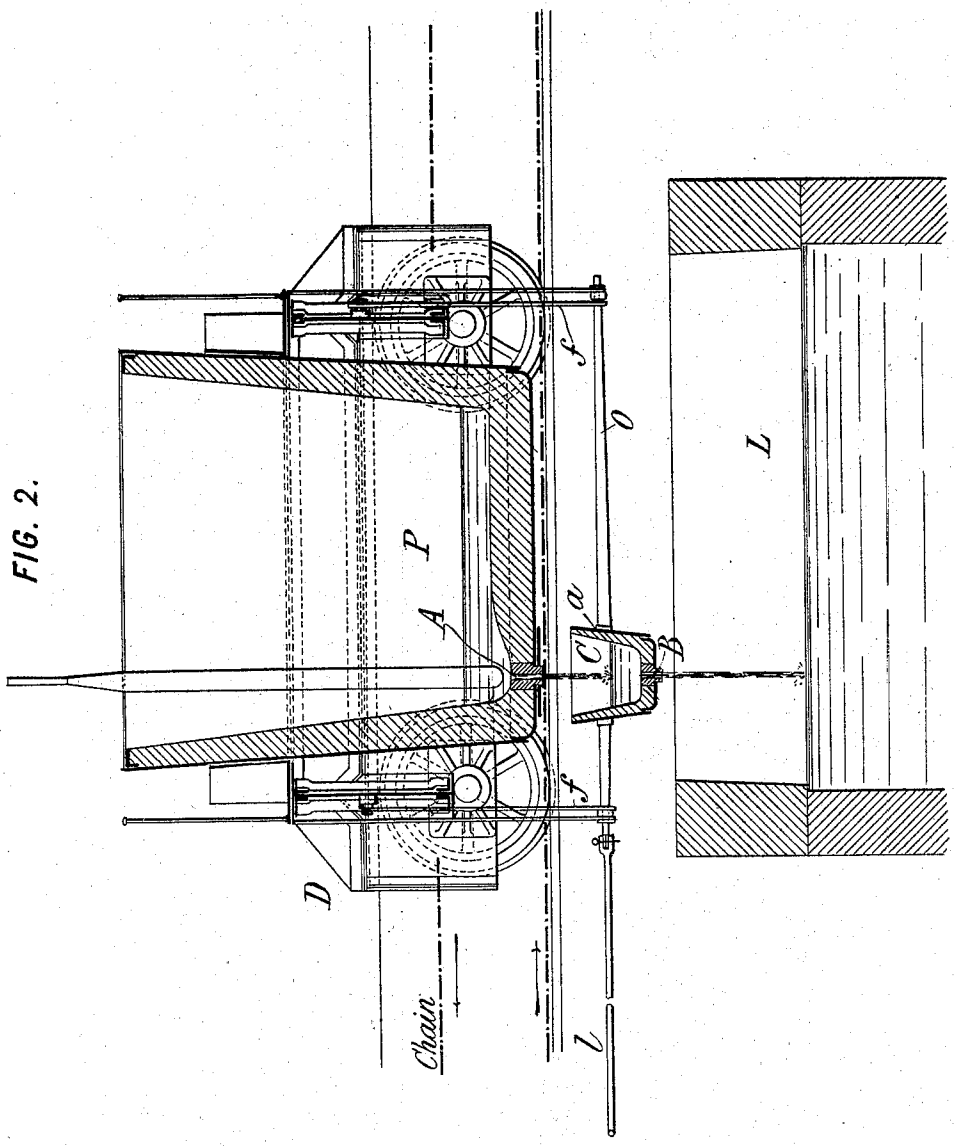
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FIG. 2.



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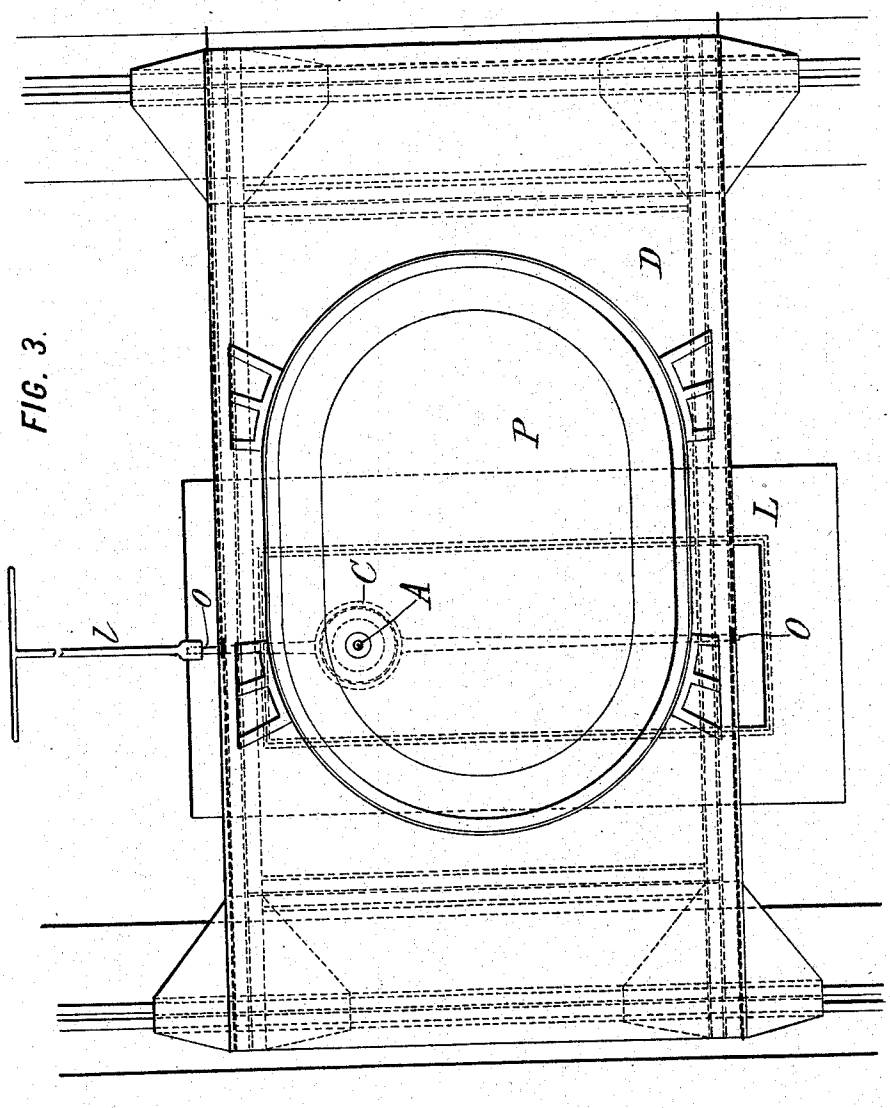
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FIG. 3.



WITNESSES.

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FIG. 4.

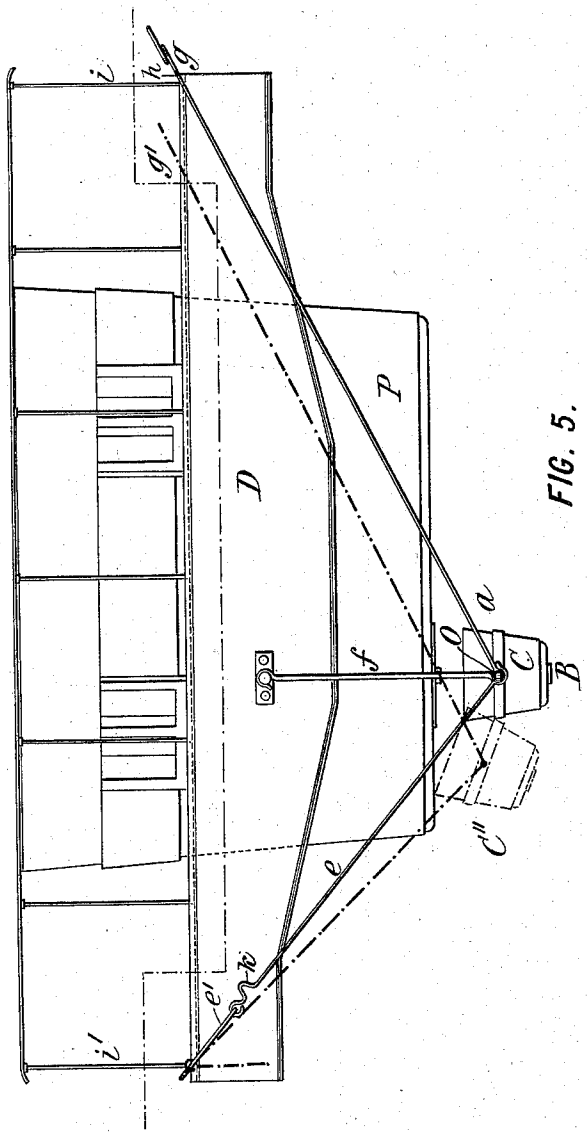


FIG. 5.

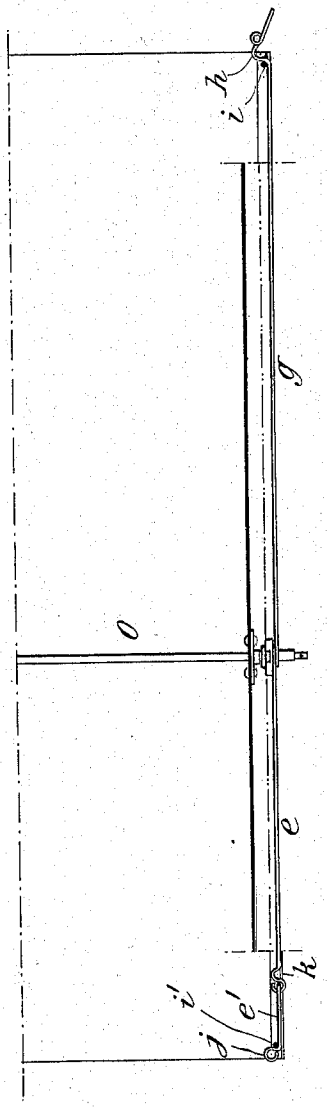
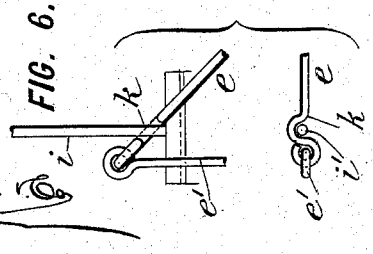


FIG. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

LÉON LÉVY, OF PARIS, FRANCE, ASSIGNOR TO THE COMPAGNIE ANONYME DES FORGES DE CHATILLON ET COMMENTRY, OF SAME PLACE.

PROCESS OF POURING METAL INGOTS.

SPECIFICATION forming part of Letters Patent No. 612,610, dated October 18, 1898.

Application filed January 6, 1897. Serial No. 618,122. (No specimens.)

To all whom it may concern:

Be it known that I, LÉON LÉVY, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Processes of Pouring Metal Ingots, of which the following is a specification.

This invention relates to the process of pouring steel or other metal to form ingots.

Part of the cavities produced in forging large steel ingots result from the fact that during the pouring of the metal there is produced at the surface a solid crust, which is at times covered by liquid metal without becoming fused again, and this chiefly at the sides and angles. This phenomenon is marked to a still greater extent when the steel contains certain metals—chromium, nickel, &c. In order to obviate this defect, I have devised a method of pouring in such a way as to cause the jet to reach all parts of the surface of the ingot. For this purpose I employ the arrangement shown in the accompanying drawings.

Figure 1 is a vertical transverse section. Fig. 2 is a vertical longitudinal mid-section. Fig. 3 is a plan. Fig. 4 is a front elevation viewed in the same direction as Fig. 1. Fig. 5 is a partial plan of Fig. 4. Fig. 6 includes a fragmentary enlargement of the extreme left-hand end of Fig. 4 and beneath it a plan of the same parts shown in this enlarged fragment.

An intermediate ladle C of small size, provided with an outflow-hole B, is suspended under the ladle P, which receives the charge of metal from the furnace and which has an outflow-hole A, directing the metal into the intermediate ladle C.

The small ladle C, mounted on trunnions O, hung from hangers *f f* and steadied by ties *e g*, can by means of a hand-lever *l* be oscillated, which by inclining the jet from B causes it to reach all parts of the surface of the metal in the ingot-mold L in a direction transverse to the section of the ingot. As the main ladle P is at the same time moved in a longitudinal direction by its carriage D moving on tracks, as usual, it is obvious that all parts of the metal surface can be successively reached during the pouring.

C′ indicates the extreme position of the intermediate ladle on the one side. It may swing to a corresponding position on the other side. When the ladle C is moved to the position C″, the metal can be poured directly from the main ladle P into the ingot-mold L.

In order to enable the ladle to be swung to the position C″, the ties *e g* are of peculiar construction. The upper end of the tie *g*, instead of being permanently attached to the carriage D, is formed with a hook *h*, Fig. 5, which takes partly around one of the upright bars *i* of the railing. The tie *e* is made in two sections, of which the upper one *e′* is linked to the lower and is formed at its end with a hook *j*, which hooks partly around a post *i′*, while the main tie-rod *e* is formed with a bend *k*, capable of engaging with the same post *i′*, as shown in Figs. 5 and 6. Ordinarily the tie-rod *g* is connected on its end by its hook *h* and the tie-rod *e′* is connected by its hooked end *j*, as shown in Fig. 5; but when it is desired to swing the intermediate ladle to one side the hook *h* is disengaged, the hook *j* is also disengaged, and the tie-rod *e* is pulled up and its bend *k* hooked over the post *i′*, as shown in Fig. 6, thereby displacing the rods and ladle to the positions shown in dotted lines in Fig. 4.

Instead of arranging a movable intermediate ladle between the main ladle and the ingot-mold I can attain the same result by giving the main ladle an oscillating movement on its carriage in the transverse direction, while the carriage moves longitudinally.

I claim as my invention—

1. The process of pouring molten metal to avoid formation of solid crusts imprisoned in the liquid metal, and consequent cavities in the forging, by directing the jet downwardly and successively back and forth over different portions of the metal surface, substantially as set forth.

2. The process of pouring molten metal to avoid formation of solid crusts imprisoned in the liquid metal, and consequent cavities in the forging, by directing the jet downwardly and repeatedly from side to side and from end to end of the mold to cover all portions of the surface of the ingot, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LÉON LÉVY.

Witnesses:

JULES ARMENGAUD, Jeune,

EDWARD P. MACLEAN.