No. 789,134. PATENTED MAY 9, 1905.

R. BAGGALEY.

COPPER POURING SPOON AND SPLASH SHIELD.

APPLICATION FILED APR. 8, 1904.

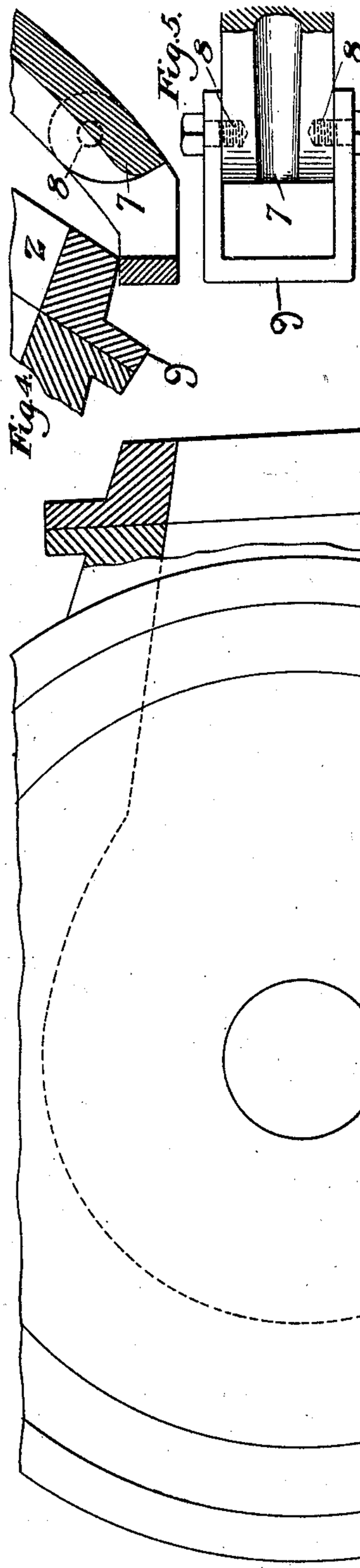

Fig. 4.

Fig. 5.

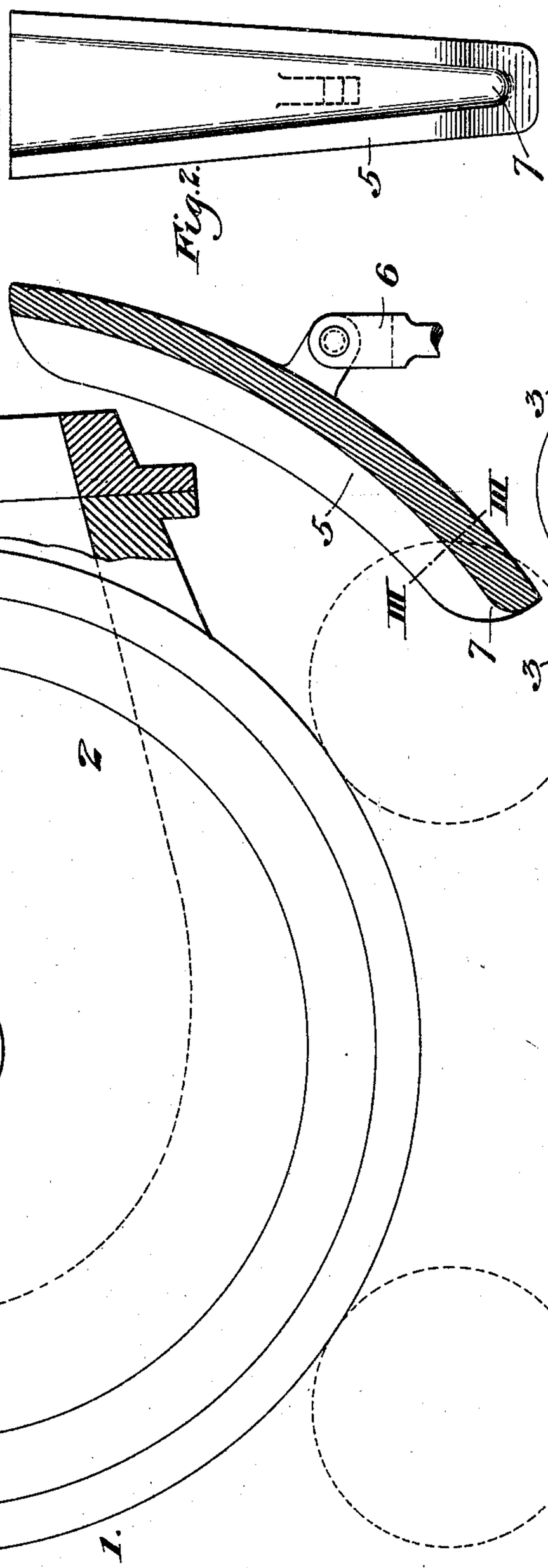

Fig. 1.

Fig. 2.

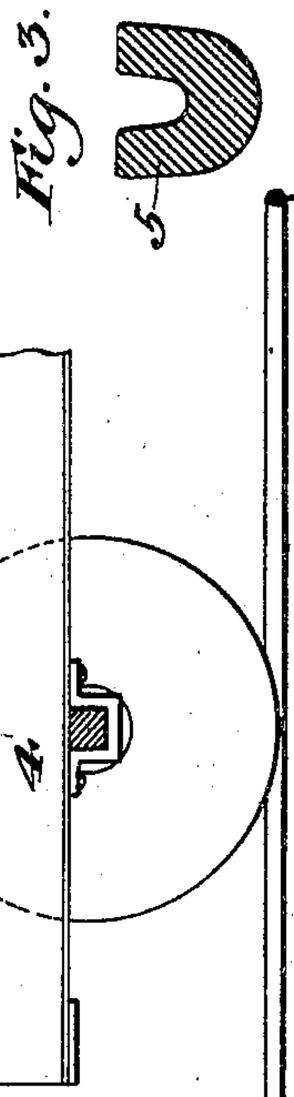

Fig. 3.

WITNESSES

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No. 789,134. Patented May 9, 1905.

UNITED STATES PATENT OFFICE.

RALPH BAGGALEY, OF PITTSBURG, PENNSYLVANIA.

COPPER-POURING SPOON AND SPLASH-SHIELD.

SPECIFICATION forming part of Letters Patent No. 789,134, dated May 9, 1905.

Application filed April 8, 1904. Serial No. 202,192.

To all whom it may concern:

Be it known that I, RALPH BAGGALEY, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Copper-Pouring Spoon and Splash-Shield, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of my apparatus. The converter in connection with it is shown, being partly in elevation. Fig. 2 is a plan view of the device for directing copper into the molds. Fig. 3 is a section on the line III III of Fig. 1; and Figs. 4 and 5 show in section and plan the splash-shield, which may be used, if desired.

In casting copper from the converter into molds with the apparatus heretofore employed there have been very serious losses by splashing, by spilling, and from failure to pour the metal in an easily-controllable stream into the molds, and when the metal is poured rapidly these difficulties have been greatly aggravated.

I have devised means by which the casting operation is rendered controllable and can be performed with little loss and much more rapidly than heretofore.

In the drawings, 2 represents the converter, shown in tipped position as it is when pouring commences.

3 3 are the molds, which are carried by a car 4, and 5 is an intermediate spoon mounted on a support 6 by a bolt, (shown in Fig. 1,) which normally holds the spoon with sufficient pressure to prevent its turning. The spoon is made of thick and preferably unlined metal, and its cross-section is trough-shaped. It is open throughout its length and may be suitably lined. It is mounted in nearly upright position and has a pouring-lip 7, and it tapers in width from the receiving end next to the converter to the lip which is over the molds. The metal poured from the converter flows down the spoon and by its converging sides is delivered from the lip in a narrow easily-controlled stream into the molds as they are drawn thereunder.

Fig. 4 shows in section, and Fig. 5 shows in plan view, a splash-shield 9, that may be attached to the bottom end of the pouring-spoon, if desired, and which is preferably readily removable by means of the set-screws 8 either for renewal or for any other reason. Where this splash-shield is used in connection with the pouring-spoon, the latter is preferably made somewhat wider and with straight sides at its lower end, the object being to admit of the splash-shield being readily and securely attached to the spoon and also thus to admit of the shield preferably inclosing a space of approximately twelve inches square, as shown in Fig. 5. The shield is preferably made of cast-iron; but it may be made of any other suitable material. Its normal position is such that its lower edge will aline with the top of the mold-level and its upper edge will aline with the radius of the swing of the converter's nose. Its position over a mold when pouring occurs will necessarily be as near to the middle of the mold as possible. Hence in turning down the nose of the converter should any deposit or accretions exist on it these in passing the shield may possibly at one single point in the circle strike the top of the shield and momentarily depress it into the mold through the swinging of the spoon on its hinges. As the converter-nose passes the shield its engagement will be freed. It will be understood that the spoon is intended to remain in one position and that it is only utilized in pouring copper into the molds at a time when the converter is comparatively full and when as a consequence pouring is commenced. As the pouring of copper into the molds continues and as the converter is proportionately emptied of its contents and when its nose is inclined downward at an angle of, say, thirty degrees it will have passed the pouring-spoon and the splash-shield entirely, and thereafter until the converter is emptied the pouring can and must be direct into the mold without the intervention of the pouring-spoon. In this position the nose of the converter is almost in contact with the molds, and very little splash or waste occurs during this portion of the pour. The real splashing and loss occur during the commencement of the pour, or, in other words, when

the molten copper must fall a considerable distance before it engages the mold. My invention, therefore, corrects and prevents this splash and waste during the early stages of the pouring. The splash-shield catches all side and front splash and returns the copper so splashed either in a liquid or in a congealed form into the mold, where it will be incorporated in the still liquid plate or pig that is in process of pouring.

Any copper that adheres to the inside of the splash-shield is readily detached without any loss whatever, and it may be placed in a mold to become incorporated as a part of the next pig or plate that is cast, or it may be returned to the converter for remelting.

My present invention prevents the waste that at present exists in practice when copper is poured from a converter into molds. When the converter after pouring is returned to an upright position, should accretions on its nose engage the shield it cannot do harm, because the effect would simply be to turn the spoon slightly on its standard, and thus to remove the shield and the spoon from the path of the converter-nose. After the converter has been restored to upright position the movement of the car 4 forward beneath the converter will restore the spoon to its proper position by contact of the edges of the molds with its lower end.

It will be noted that I make the inside area of the shield as small as possible, so that it will not interfere with the act of pouring, and my reasons for doing so are important:

(*a*) Owing to the swing of the converter-nose, it is impossible to make the sides of the shield very high. Hence the closer its walls are to the point where the molten copper enters the mold the greater will be the percentage of splash it will catch.

(*b*) It is important that the converter foreman and those who move the mold-car should be able at all times to see the level and the conditions of the molten copper in each mold in order to guide them in their work. This becomes possible where the shield is made smaller than the area of the mold, for the workmen can then see the molten copper entirely around the outside edges of the shield. If the shield were made larger than or as large as the top surface of the pig or plate, the molten copper would be covered by the shield, and it would therefore be invisible to the workmen.

Many changes in the form, construction, and design of the pouring-spoon and splash-shield may be made without departing from the spirit of my invention.

I am aware that spoons with wide and nearly flat surfaces have been used for directing molten metal into the mold; but

What I claim is—

1. Casting apparatus comprising a spoon open throughout its length having converging trough-shaped sides and a pouring-lip mounted in nearly vertical position between a converter and the molds; substantially as described.

2. Casting apparatus comprising a spoon open throughout its length and having a splash-shield at its lower end, said spoon being mounted in nearly vertical position between the converter and the molds; substantially as described.

In testimony whereof I have hereunto set my hand.

RALPH BAGGALEY.

Witnesses:
J. H. REED,
THOMAS W. BAKEWELL.