No. 697,769. Patented Apr. 15, 1902.

A. M. ACKLIN.

CASTING APPARATUS.

(Application filed Jan. 29, 1901.)

(No Model.)

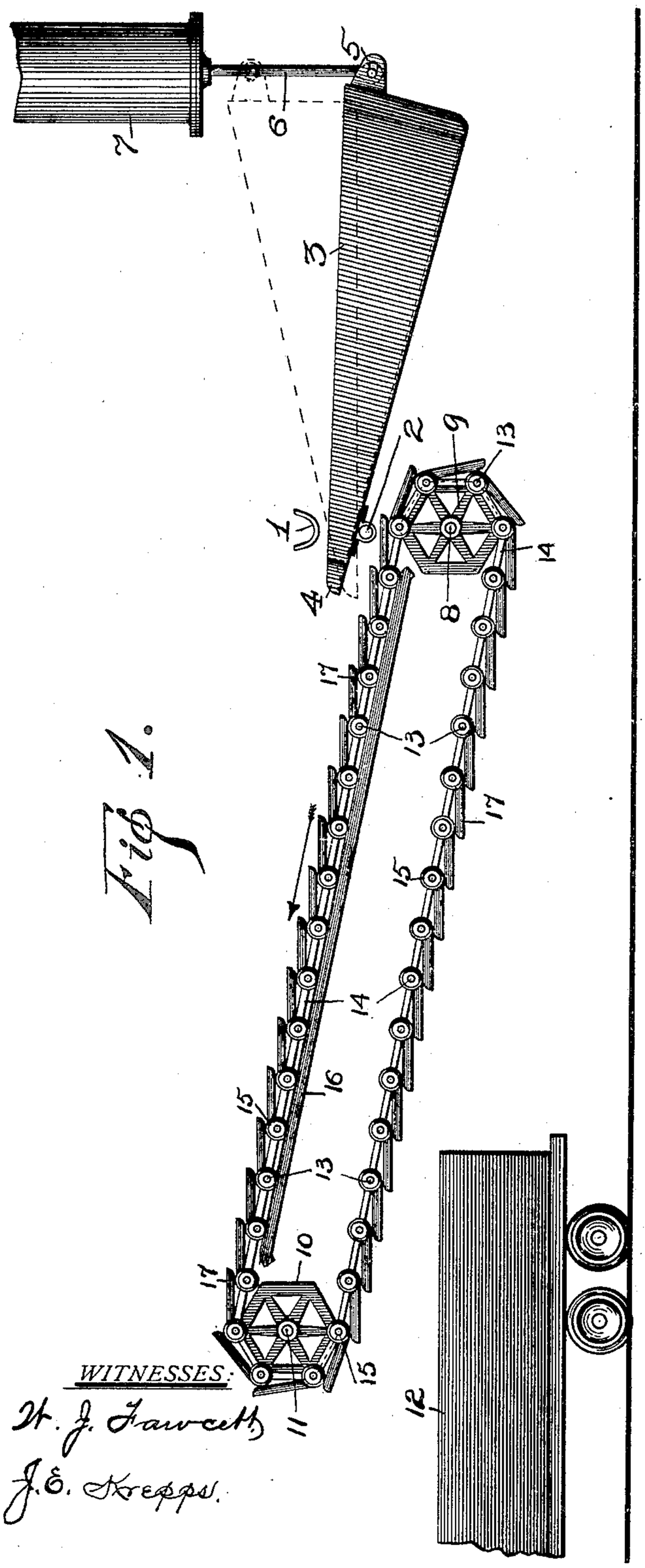

Fig. 1.

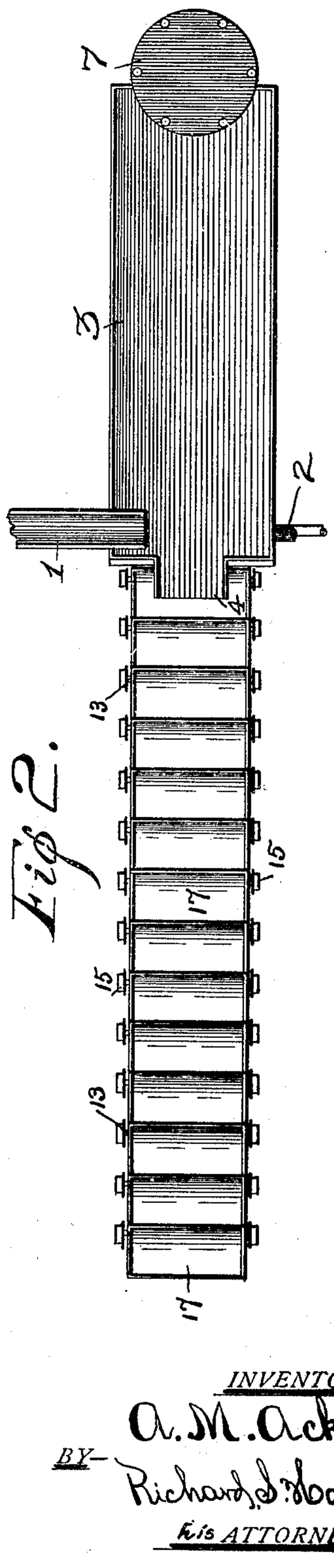

Fig. 2.

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CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 697,769, dated April 15, 1902.

Application filed January 29, 1901. Serial No. 45,207. (No model.)

To all whom it may concern:

Be it known that I, ALFRED M. ACKLIN, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Casting Apparatus or Plants; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the provision of a means whereby the "flow" of liquefied slag, metals, &c., issuing from a furnace may be discharged in a uniform quantity onto a mold-carrying conveyer and discharged therefrom.

I accomplish my object by means of the apparatus illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus shown in connection with a conveyer. Fig. 2 is a plan view of the same.

In said drawings the numeral 1 designates a spout or "runner" such as extends from a furnace to conduct the molten material therefrom. A reservoir 3, having a spout 4 at its forward end and lugs 5 at its rear, is mounted upon trunnions 2 at a point a short distance from the spout and directly beneath the said runner. This reservoir is preferably made of an approximately triangular form, giving greater depth in the rear than at the forward end. The rear of the reservoir is attached, by means of the lugs 5, to a piston-rod 6 of a hydraulic apparatus 7, which is preferably located immediately above.

A suitable mold-carrying conveyer is employed in connection with the device, and in this case I have shown one which is particularly adapted for use in this instance. Briefly this conveyer consists of a shaft 8, having secured thereon a pair of wheels 9. This shaft is located beneath the forward end of the reservoir, directly in line with the trunnions thereof. A similar pair of wheels 10 is mounted upon a drive-shaft 11. This drive-shaft is placed at an elevation sufficient to permit a car 12 to clearly pass beneath for loading. The conveyer-belt is composed of a plurality of parallel bars 13, placed equidistant apart and coupled to one another by links 14. These bars are provided at their outer ends with wheels 15, which are adapted to travel upon the inclined rails 16. The conveyer-links carry a number of molds 17, which are arranged upon a level and overlapping one another in their rear.

In practice as the material issues from the runner of the furnace it empties into the reservoir and passes therefrom through the spout into the conveyer-molds, which travel in the direction indicated by the arrow at Fig. 1. The material deposited in the molds becomes solidified into cakes and is readily discharged therefrom into the car or other receptacle at the opposite end of the conveyer. Should the flow of material from the furnace-runner be beyond the capacity of the conveyer-pans, the piston of the hydraulic apparatus is allowed to descend, thereby lowering the rear end of the reservoir in order to receive the surplus material. Should the surplus material at any time be sufficient to fill the reservoir, it will assume a position as shown in full lines at Fig. 1. By proper manipulation of the hydraulic apparatus controlling the movements of the reservoir a uniform flow of material from said reservoir may be maintained until the entire contents are discharged.

In order that my invention may be fully distinguished from those apparatuses for casting metal wherein there is employed a traveling carrier provided with a series of molds and a pivoted ladle which receives the metal flowing from the spout of the furnace and delivers the same to the molds successively brought into filling position by the operation of the traveling carrier, I deem it desirable to call especial attention to the fact that in the present invention the forward portion or pouring-lip, hereinafter termed "the metal receiving and discharging portion" of the trough, discharges continuously into the molds and is arranged approximately beneath the furnace-spout, so that it instead of the reservoir or deeper portion of the trough first receives the metal from the furnace, and a portion of the metal is caused to flow rearward into the reservoir, or all of the metal is caused to flow directly from the receiving and discharging end of trough and into the molds without flowing into said reservoir, as desired, by adjust-

ing the inclination of said trough. Thus the shallower part of the trough (which is constructed to form a pouring-lip and way thereto or otherwise to provide a practical discharge end and is located directly or approximately beneath the spout of the furnace and receives the metal flowing from said spout) is approximately level, as shown in dotted lines in Fig. 1, or is slightly inclined toward the molds, when the metal flows from the furnace with what for purpose of illustration may be termed a "normal speed"—that is to say, a speed which accords with the speed of travel and size of the molds—so that there will be no metal flowing from the furnace-spout in excess of that required properly to fill the molds as the latter are successively brought into position to be filled. When said condition obtains, the trough performs solely the function of a stationary guide for conducting the molten metal from the furnace-spout to the molds, and its forward end constitutes not only the metal-discharging portion thereof, but, if downwardly inclined toward the molds, it will also constitute the sole metal-receiving portion thereof, and it delivers the metal to said molds as rapidly as it receives the same from the furnace without detaining or retaining any of said metal as it flows from the furnace. In view of the difficulty of controlling the flow of metal from the furnace so as to accord with the speed of travel and the size of the molds, which also may vary, the portion of the trough at the rear of said pouring-lip or metal receiving and discharging end is formed to constitute a reservoir, and when the flow of metal to the trough is in excess of that required to fill the molds (termed for illustration a "normal speed") said trough may be lowered pivotally and a portion of the metal flowing from the furnace thereby diverted from said receiving and discharging end of the trough and caused to flow rearward into and be retained in the rear or reservoir portion of the trough, thus storing the excess in the reservoir and making constant the flow to the molds regardless of variations in the speed of flow from the furnace. Moreover, by adjusting the inclination of said trough the flow of metal from the discharge end thereof may be varied to accord with a variation in the speed of travel of the carrier, which may occur without variation in the flow from the furnace, and also to accord with a variation in the sizes of the molds on said carrier. The operation of the device in filling the molds is thereby made continuous, there being no interruption either in the flow from the furnace-spout to the trough or from the latter to the molds, and the service of an attendant is required only to watch the conditions obtaining and adjust the trough to accord therewith. When the flow from the furnace is insufficient to fill the continuously-traveling molds and there is an accumulation of excess metal in the reservoir, the trough may be adjusted to elevate its rear end or reservoir portion, so as to supply the deficiency.

The use of a trough having its bottom arranged approximately in the same plane from end to end, as shown in the accompanying drawings, is very advantageous for the purpose of the present invention, as a very slight change in the degree of inclination thereof causes a change in the speed of flow of metal therefrom whether the reservoir portion thereof be filled or not, and this reduces the extent of adjustment thereof which would otherwise be required. The conventional construction of ladle having an abrupt wall between its pouring-lip and bottom or having said lip arranged at a pronounced angle with the main body portion of the ladle is not well adapted for the purpose of the present invention. The construction of the carrier and the molds, and the location of said molds relatively to each other and to the pouring-lip or discharge end of the trough are also of advantage, in that they contribute to a reduction of the time within which a given number of castings may be made. Each is located in a higher plane than the one succeeding it and overlaps the same, so that an excess supplied to one may freely overflow onto the other, which latter will have assumed a position enabling it to retain an overflow when the one preceding it has reached the place at which it is filled, thereby rendering it possible to rotate the carrier continuously.

As previously stated, it is preferable to construct the reservoir of an approximately triangular form in the direction of its length in order to allow the entire contents to be discharged with the least possible elevation of the rear end. A further object is to permit the furnace spout or runner to be placed as low as possible without interfering with the movements of the reservoir.

Although I have shown and described a hydraulic means of raising and lowering the reservoir, it is clear that other means may be employed without departing from the spirit of my invention.

Having thus shown and described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a traveling carrier, provided with a series of molds, and a furnace, of a means for conducting molten metal from the furnace to said molds, continuously and at constant or regulated speed, comprising a trough interposed between said carrier and furnace and normally so related thereto as to constitute a stationary guide for conducting metal from the furnace to the molds approximately without intermission in the flow thereof, said trough having its forward end in communication with the furnace-spout so as to receive metal therefrom and constructed and arranged to discharge continuously into said molds, and, being constructed, rearward of its said metal receiving and discharging end, to form a reservoir for

the accumulation therein of excess metal under abnormal conditions, and means for adjusting said trough so as to cause the metal to be conducted to the molds as rapidly as it flows from the furnace, or cause a regulated portion of the metal to be diverted from the discharge end of the trough and be detained in said reservoir, or to cause metal in the reservoir to flow into said discharge end.

2. The combination with a traveling carrier, provided with a series of molds, and a furnace, of a means for conducting molten metal from the furnace and discharging the same continuously and at constant or regulated speed into the molds, comprising a trough pivoted near its front end and interposed between said furnace and molds, said trough having an approximately plane bottom and approximately triangular sides, and having its forward end arranged in communication with the furnace-spout so as to receive the metal therefrom and arranged to discharge into the molds continuously, said forward end terminating in a contracted pouring-lip, the rear portion of said trough constituting a reservoir which is normally arranged to detain none of the metal flowing from the furnace, and means connected with the rear end of the trough for adjusting the inclination of the latter so as to cause a regulated quantity of the metal to be diverted from the metal-receiving end thereof into said reservoir, or to cause metal in the reservoir to flow therefrom into said receiving end, substantially as described and for the purposes set forth.

3. The combination with a continuously-rotated carrier, provided with a series of molds, and a furnace having continuously-open communication with its spout, of a means for conducting molten metal from the furnace and discharging the same continuously and at constant or regulated speed into the molds, comprising a pivoted trough interposed between said furnace and carrier, having its forward end in communication with the furnace-spout so as continuously to receive molten metal therefrom and arranged to discharge metal continuously into the molds, said trough being constructed rearward of its said metal receiving and discharging end, to form a reservoir which is normally arranged to detain none of the metal flowing from said furnace, and means for adjusting said trough so as to cause a regulated portion of the metal to be diverted from said forward end thereof into said reservoir, or to cause metal from said reservoir to flow into said forward end, substantially as described and for the purposes set forth.

4. The combination with a pivoted device designed to receive molten metal from a furnace and having a pouring-lip at one end, and an endless carrier projecting to beneath said lip at one end, of a series of flat molds arranged in a step-by-step relation upon said carrier and each having an end overhanging that of the one next adjacent, said parts being so related that when a mold has reached a position where it directly receives the flow from said lip the one approaching said position will have assumed a horizontal plane to retain an overflow, substantially as described.

5. The combination with a pivoted device designed to receive molten metal from a furnace and having a pouring-lip at one end and disposed constantly to discharge the metal and, when the speed is normal, discharging said metal approximately as fast as the metal is delivered to it, and having a reservoir portion, and means for adjusting the inclination of said device when the speed is abnormal and to accord therewith, and an endless carrier projecting to beneath said lip at one end, of a series of flat molds arranged in a step-by-step relation on said carrier and each having an end overlapping that of the one succeeding it, said parts being so related that when a mold has reached a position where it directly receives the flow from said lip the one approaching said position will have assumed a horizontal plane to retain an overflow, all substantially as described and for the purposes set forth.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

ALFRED M. ACKLIN.

Witnesses:
JAS. J. MCAFEE,
J. E. KREPPS.