

(No Model.)

2 Sheets—Sheet 1.

J. R. & L. A. SELL.

APPARATUS FOR MAKING AND TRANSFERRING PIG METAL.

No. 362,670.

Patented May 10, 1887.

Fig. 1.

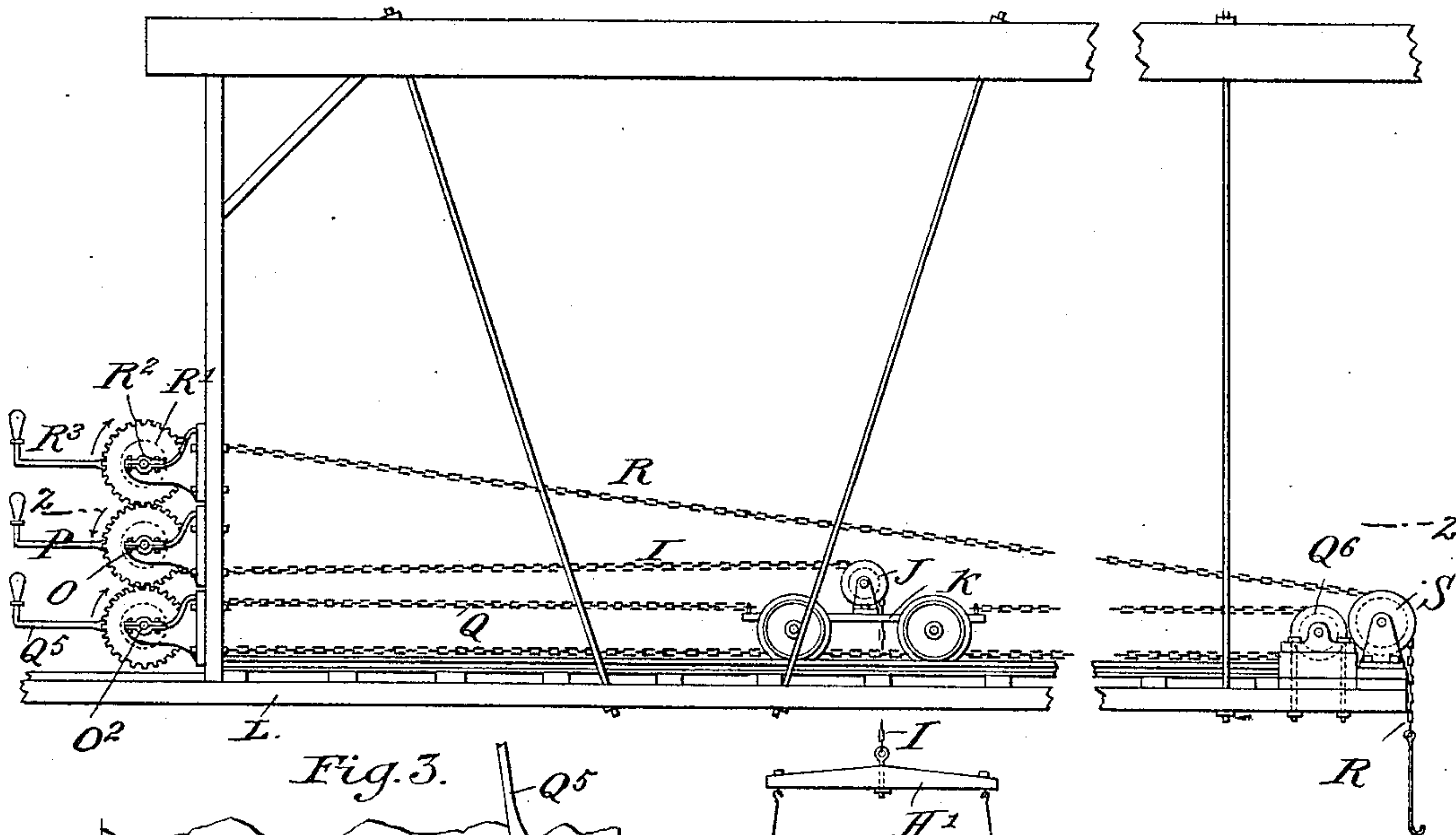
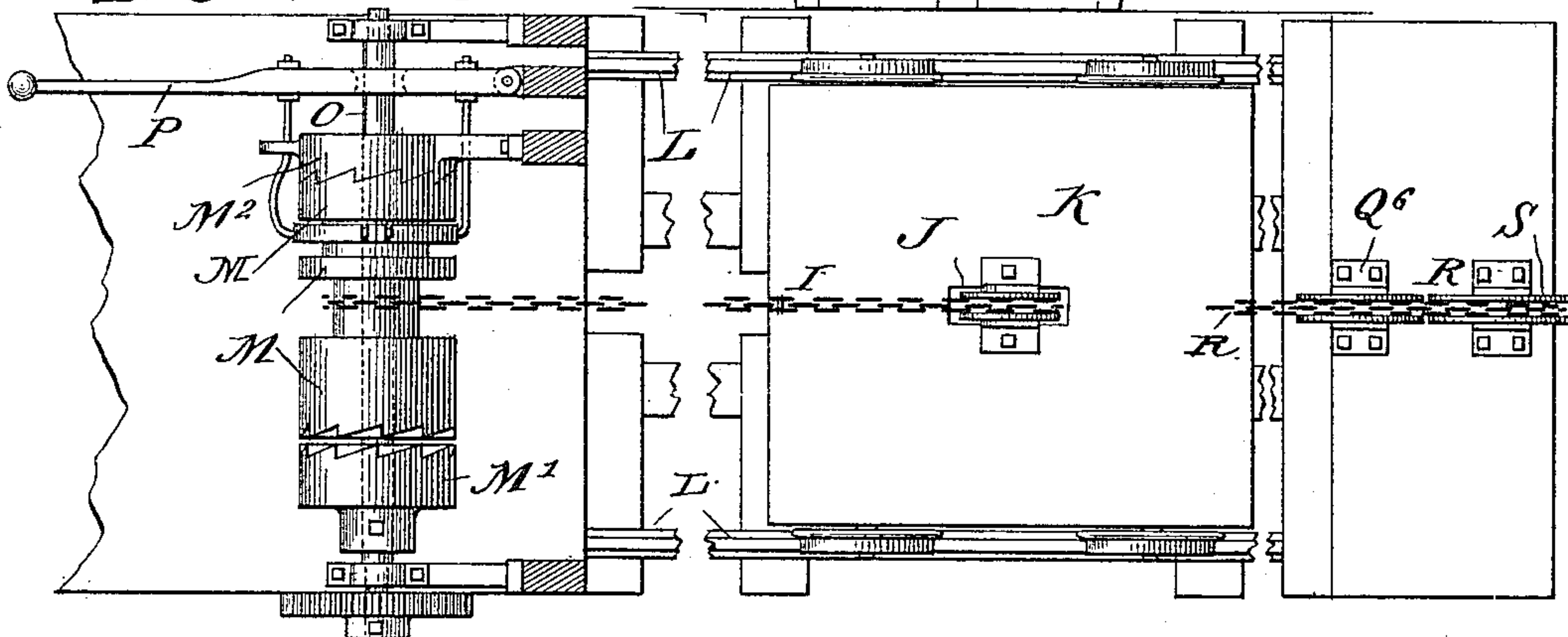
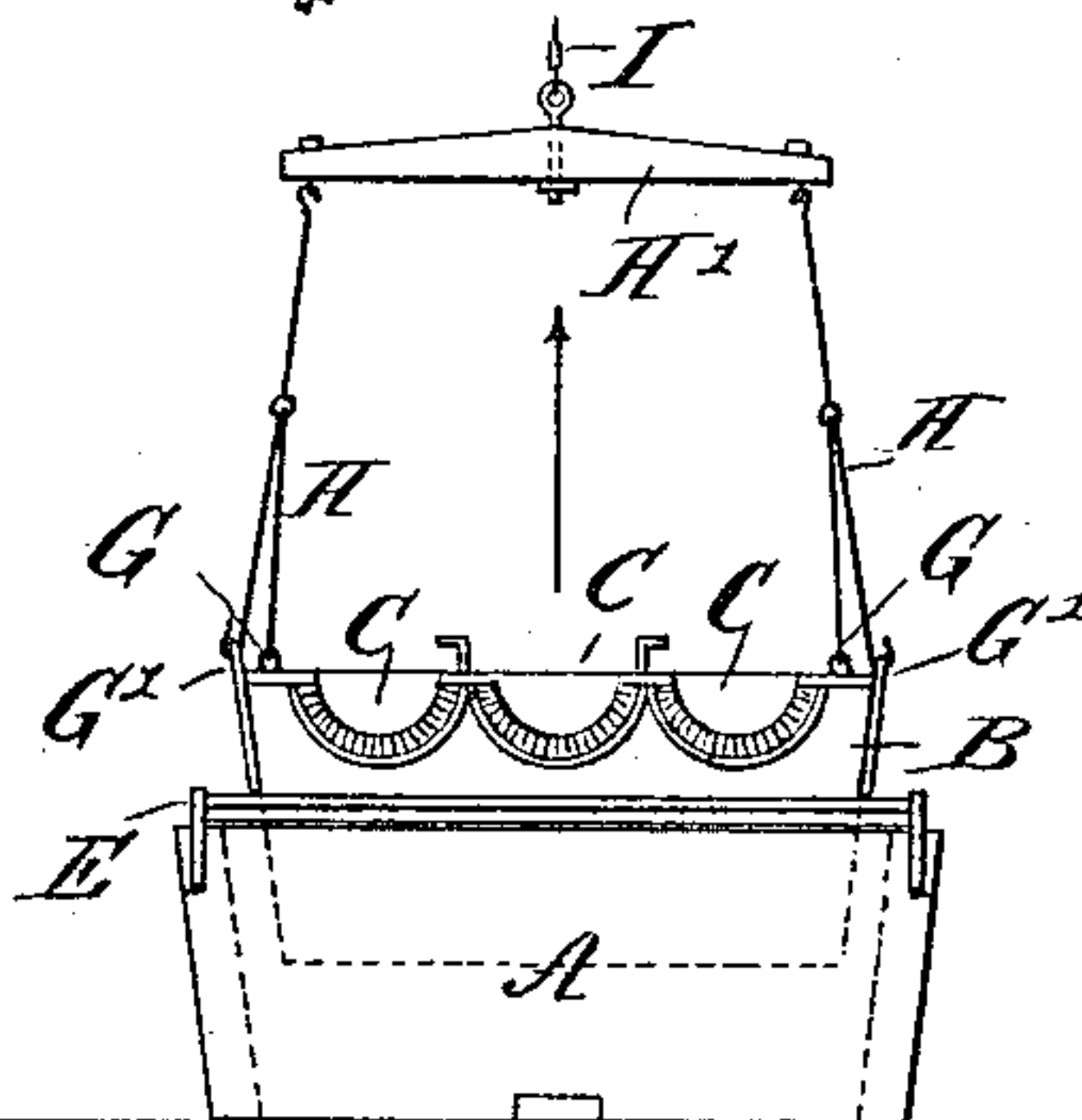
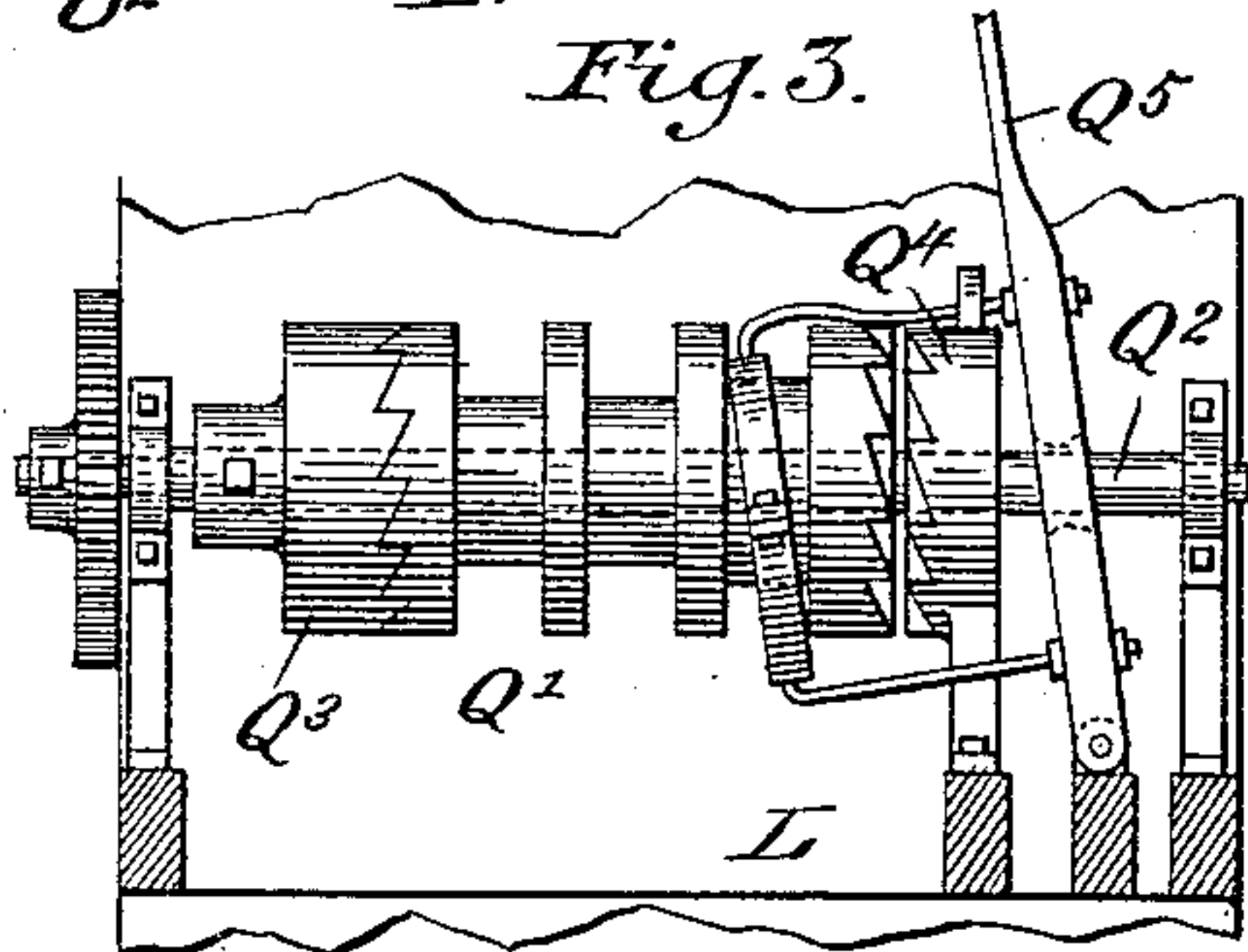


Fig. 3.



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Fig. 2.

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(No Model.)

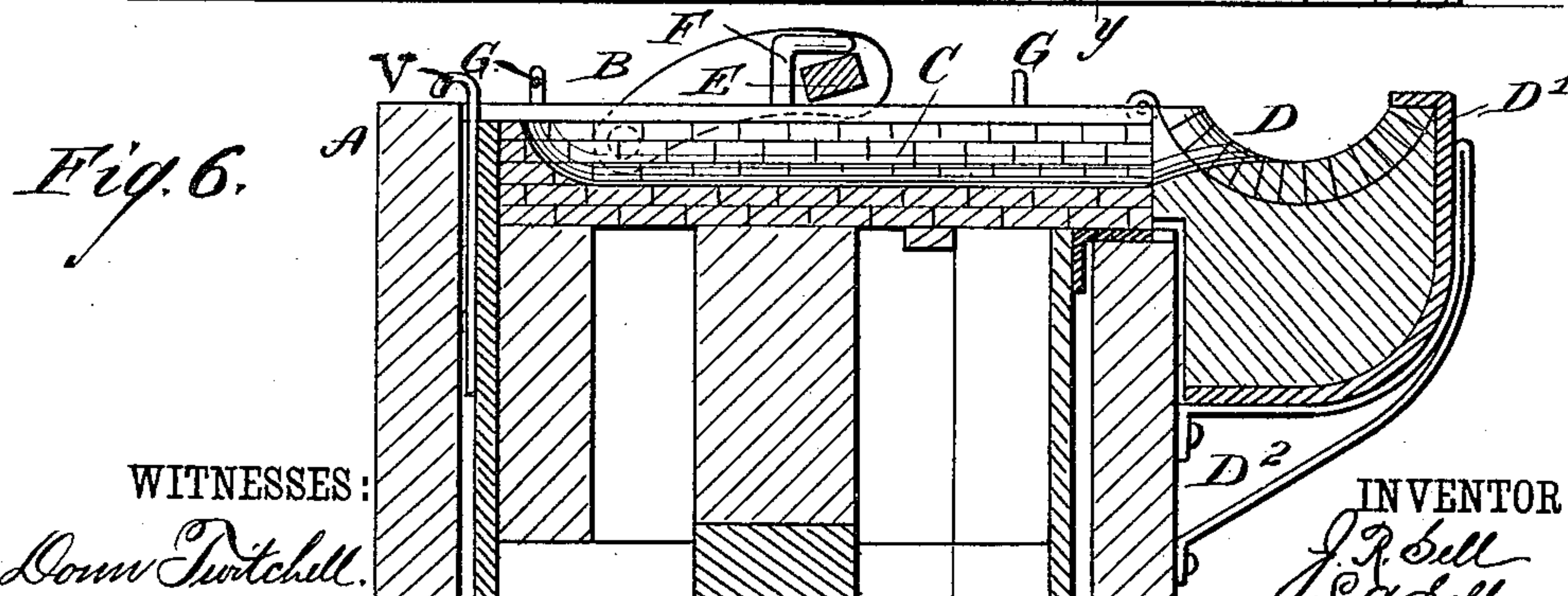
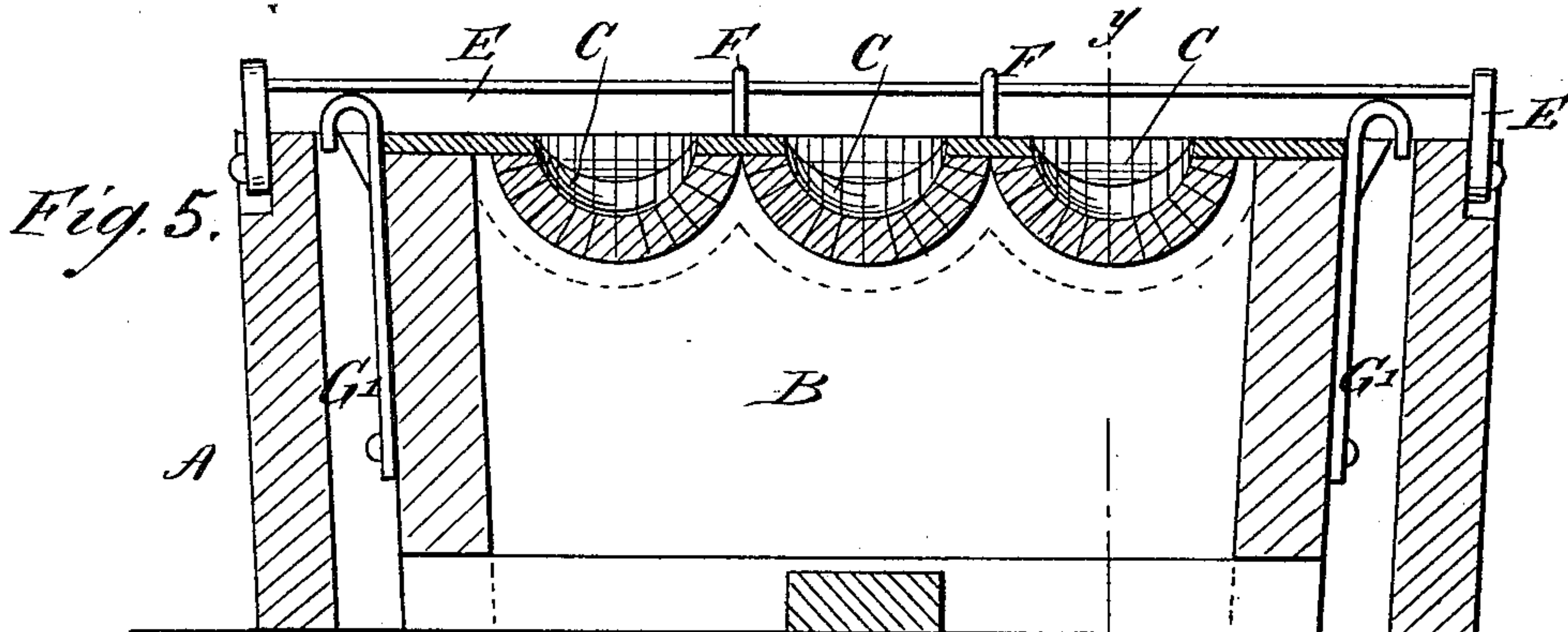
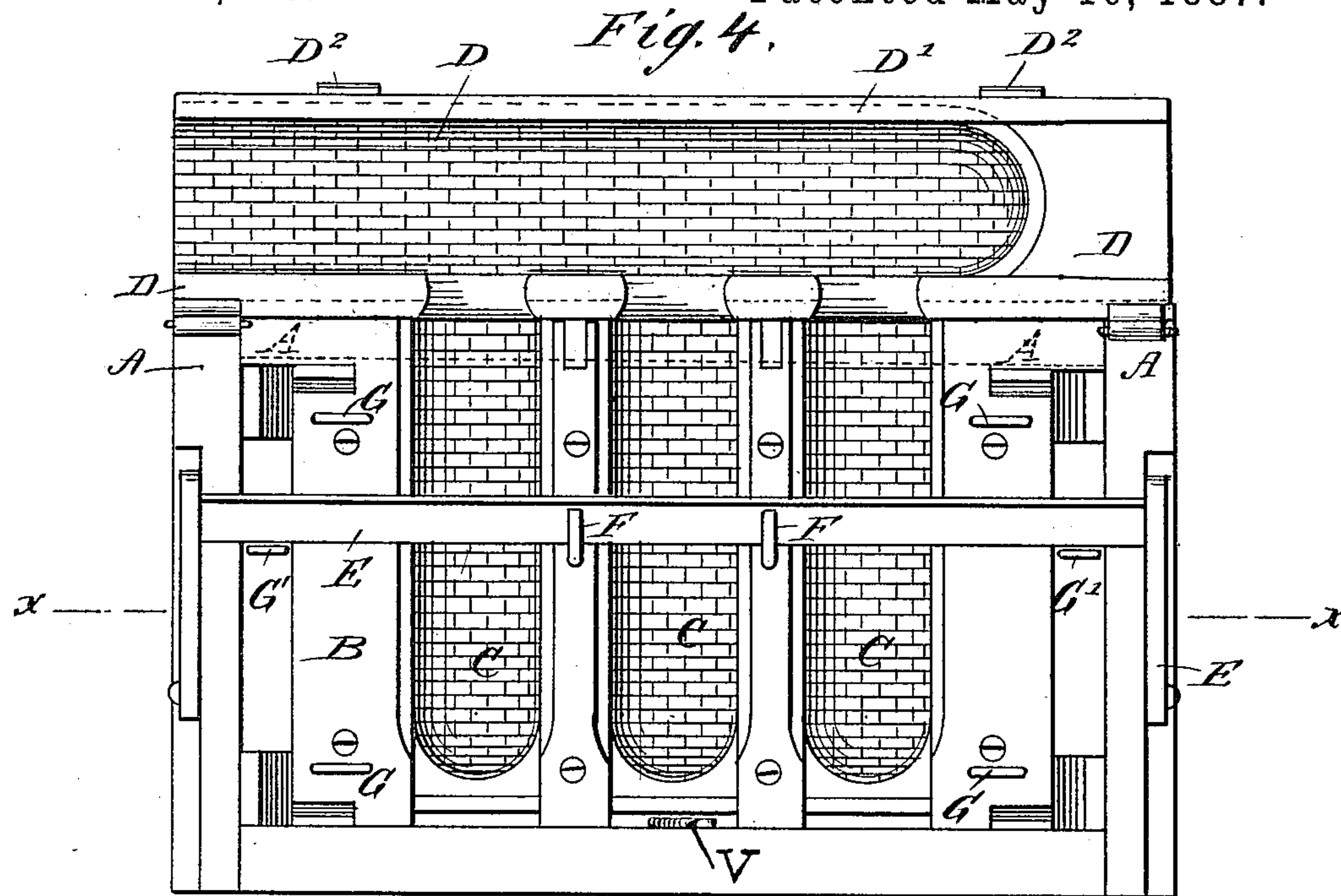
2 Sheets—Sheet 2.

J. R. & L. A. SELL.

APPARATUS FOR MAKING AND TRANSFERRING PIG METAL.

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UNITED STATES PATENT OFFICE.

JOHN R. SELL AND LEROY A. SELL, OF JOHNSTOWN, PA.

APPARATUS FOR MAKING AND TRANSFERRING PIG METAL.

SPECIFICATION forming part of Letters Patent No. 362,670, dated May 10, 1887.

Application filed December 9, 1886. Serial No. 221,075. (No model.)

To all whom it may concern:

Be it known that we, JOHN R. SELL and LEROY A. SELL, both of Johnstown, in the county of Cambria and the State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Making and Transferring Pig Metal, of which the following is a full, clear, and exact description.

The object of our invention is to provide an apparatus for making pig metal, and then transferring the mold or chill carrier and its molds, chills, or troughs bodily to a point adjacent to a track and then dumping the mold or carrier, so as to cause the then hardened or formed pig metal to fall into a car on the said track.

The invention consists of various parts and details, and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of our improvement. Fig. 2 is an enlarged sectional plan view of the same on the line zz of Fig. 1. Fig. 3 is an end elevation of one of the drums. Fig. 4 is a plan view of the stationary bed and the carrier-bed. Fig. 5 is a vertical sectional elevation of the same on the line xx of Fig. 3, and Fig. 6 is a vertical cross-section of the same on the line yy of Fig. 4.

At a suitable distance from the tap-hole of a cupola or blast furnace is arranged the iron casing or bed A, in which is held the pig-metal carrier B, provided with a number of transverse brick troughs, chills, or molds, C, which open at one end into the longitudinal brick trough, mold, or chill D, held in a suitable metal casing, D', pivoted to the stationary bed or casing A, and extending on one side thereof. The trough or chill D is somewhat higher than the series of troughs or chills C, so that when the molten metal is run from a cupola or blast furnace into said trough or chill D it will run thence into the series of troughs or chills C, as will be readily understood in connection with Figs. 4, 5, and 6 of the drawings. The pig metal will be of less thickness at the juncture of the chills C and trough D, which allows of it being more readily broken

when the trough D is swung upward. Additional braces, D², assist in supporting the casing D', and rest against the side of the bed A. A U-shaped frame, E, is pivoted on the ends of the casing or bed A, and can be locked over the carrier-bed B in order to hold the pig metal within the chills or molds C when the hinged trough D is forced upward to break the pig metal at the juncture of the trough and chills or molds by means of swivel-hooks F, secured to the bed B, as shown in Figs. 4, 5, and 6.

The top of the carrier-bed B is provided with a number of hooks or staples, G, and on the two ends are secured the hooks G', which hooks G and the hooks G' are connected by suitable rods or chains, H, (see Fig. 1,) with the cross-beam H', hung on a chain, I, passing over a pulley, J, mounted on a truck, K, running on the track L, supported in any suitable manner either from above, as shown, or from below. The chain I passes from the pulley J to the drum M, placed loosely on the shaft O, mounted in suitable bearings on standards at the inner end of the track L, and provided with suitable means for rotation.

The drum M is provided on one end with clutch-teeth, which, when the drum is moved sidewise, engage with similar clutch-teeth formed on the clutch-collar M', secured on the shaft O. A lever, P, engages the drum M, and serves to move the latter sidewise into or out of contact with the clutch-collar M'. The drum M is also provided on its other end with clutch-teeth, which engage with similar clutch-teeth formed on the clutch-collar M², secured to the track L.

A chain, Q, is fastened by one end to the front of the truck K, and then passes over and around a drum, Q', placed loosely on the shaft Q², mounted in suitable bearings on the track L, below the shaft O, and is rotated with the latter by suitable connections. The drum Q' is provided on one end with clutch-teeth, which engage similar teeth in a clutch-collar, Q³, secured on the shaft Q², and on the other end of the said drum Q' are similar clutch-teeth, which engage the stationary collar Q⁴, secured on a standard rising from the inner end of the track L. A lever, Q⁵, serves to move the drum alternately into and out of contact with the said collars Q³ and Q⁴. The chain Q passes from

the drum Q' to and over a pulley, Q⁶, mounted near the rear end of the track L, and then passes to the rear end of the truck K, and is secured to the latter.

5 A chain, R, is secured by one end to a drum, R', placed loosely on the shaft R², mounted in suitable bearings on the standards above the shaft O, and is rotated with the latter by suitable means. The drum R' is similar in construction to the drum M, and is moved alternately in contact with the clutch collar on the shaft R², and with a stationary clutch-collar secured to the standard by means of the lever R³. The chain R passes from the drum R' to 10 a pulley, S, journaled in bearings at and above the outer end of the track L, and its free end hangs down. The shafts O, Q², and R² are rotated simultaneously by suitable gear-wheels or other means.

20 The operation is as follows: The carrier-bed B rests in the stationary support or bed A, as shown in Figs. 4 and 5, and the pig metal is formed in the troughs C, which are charged by the longitudinal trough D. After the pig 25 metal is formed in the troughs or molds C, then the trough D is swung upward, so that the metal in the trough C is loosened or breaks its connections with the trough D, the bar E serving to hold the pig metal in the molds C, as before stated. The hooks F are then removed from the U-shaped cross-bar E, and the latter is swung to the rear upon the upper end of the stationary support or bed A, whereby the carrier-bed B becomes free, and it is now 35 raised out of the stationary support or bed A by throwing the drum M into contact with the clutch-collar M', secured on the rotating shaft O, so that the chain I is wound up on the said drum M, and then lifts the carrier-bed upward and out of the stationary support or bed. The drums Q' and R' are held in contact with their stationary collars and do not rotate. As soon as the desired height is attained, then the drum M is uncoupled from the collar M' and locked 40 in position by engaging the stationary collar M². The drum Q' is then moved in contact with its clutch-collar Q³, so that the truck K is set in motion on the track L and carries the carrier-bed B to a point above the track on 50 which are the cars to be loaded with the pig metal. As soon as the truck K arrives at the desired position over the cars, then the drum Q' is disengaged from its collar Q³ and locked in position by being thrown into engagement 55 with the stationary collar Q⁴. The free end of the chain R is then hooked to the staple V at the rear of the carrier-bed B, and the drum R' is connected and moved into contact with its clutch-collar on the shaft R², whereby the 60 drum R' is rotated and winds up the chain R, which tips the bed B over to the front, so that the pig metal in the trough C slides out and into the cars. In order that the pig metal may readily slide out of the troughs or chills C they 65 are formed with open forward ends, as shown in Figs. 4 and 6, which are adjacent to the in-

ner edge or side of the feed trough or chill D, which latter trough is provided with short spouts or outlets registering with said open ends of the troughs or chills C. The empty 70 carrier-bed is then returned to the stationary support or bed by causing the shafts O, Q', and R' to revolve in an opposite direction, so that the chain R is unwound and the carrier-bed B again assumes its normal position. The 75 drum R' is then disengaged from its shaft-collar and thrown into engagement with the stationary clutch-collar, so that the chain R is held in its normal position and is then unhooked from the carrier-bed B. The truck K is then 80 returned to its normal position by means of the chain Q and its drum Q', after which the carrier-bed B is let down into the stationary support or bed A by means of the drum M. The molds C are again charged, and the above- 85 described operation is repeated.

By forming the trough, molds, or chills of brick instead of casting the pig metal in sand, as is customary, the bars come from the molds or chills clean and free from sand; but I may 90 use iron molds or chills in place of brick, and, should it be found desirable at any time, the movable or carrier bed may be provided with the usual bed of sand-molds, as the pig metal could be transferred in either instance, the car- 95 rier-bed being removable and capable of being dumped, as before described.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

100 1. The combination, with the bed A, the trough D, and the U-shaped locking-frame E, pivoted at its ends to the ends of the bed, of the carrier-bed B, having molds, and pivoted hooks F, adapted to engage the cross-bar of the 105 locking-frame, substantially as set forth.

2. The combination, with the carrier-bed having molds open at their forward ends, of the supporting-bed having a feed-trough movably connected therewith and provided with 110 spouts or outlets registering with the open ends of the said molds, substantially as set forth.

3. The combination, with the bed A, having the feed-trough D pivoted thereto, and having short spouts or outlets, of the carrier-bed hav- 115 ing molds the open ends of which register with said spouts or outlets, the feed-trough being in a higher plane than the molds, substantially as set forth.

4. The combination, with a stationary bed, of 120 a carrier-bed fitting into the said stationary bed, molds or troughs formed in the said carrier-bed, and a trough pivoted on the said stationary bed and opening into the said troughs or molds on the carrier-bed, and means for locking 125 the cast pig metal in place in the molds on the carrier-bed when the pivoted trough is swung upward, substantially as shown and described.

5. The combination of the carrier-bed B, 130 provided with molds or chills, the hooks or staples G' at the end of the bed, and the hooks

G, also on the end of the bed at opposite sides of the hooks G', with the cross-bar H', having depending rods H, adapted to engage said hooks G G', and a hoisting-chain and truck, 5 substantially as set forth.

6. The combination, with the mold-carrying bed having molds open at their forward ends, of the track above the bed, the endless chain Q, extending along the track, the truck K, operated thereby and carrying a pulley, J, the 10 drum M at the rear end of the track, the chain I, passing therefrom and over the pulley J, means for connecting chain I to the carrier-bed at its sides, the drum R' at the rear end 15 of the track, the pulley S at the front end of the track, the chain R, leading from the drum R' over the pulley S, and adapted to be connected to the rear end of the carrier-bed, and means for operating said drums and endless chain, 20 whereby the carrier-bed may be moved to the outer end of the track, its rear end raised to discharge the contents of the molds through the outer open ends, and the carrier then returned to its normal position, substantially as 25 set forth.

7. The apparatus for making and transferring pig metal herein described, comprising the bed A, having the hinged trough D, formed with outlets, the carrier-bed C, resting in the 30 bed A, and having a series of molds open at their outer ends and registering with the trough-out-

lets, the track L above the bed, the shafts Q², O, and R², one above the other, at the rear end of the track, the drums Q', M, and R', loosely 35 mounted on the shafts Q², O, and R², respectively, and having clutch-teeth at the opposite ends, clutch-collars carried by said shafts, and relatively-stationary clutches at the opposite ends of the shafts, gearing connecting the 40 shafts, levers for moving said drums laterally, the pulleys Q⁶ S at the forward end of the track, the truck K on the track and having a pulley, J, the chain Q, extending around drum Q' and pulley Q⁶, and connected to the truck, the chain 45 I, passing from drum M down over the pulley J for connection with the carrier-bed, and the chain R, passing from drum R' down over pulley S, and having a hook at its free end, all constructed and operating substantially in the 50 manner and for the purpose set forth.

8. The combination, with the carrier-bed B, 50 hung on the chain I and having the series of molds or chills C, of a chain, R, adapted to be connected with the said carrier-bed and wound upon a drum so as to tip the said carrier-bed 55 to the front, substantially as shown and described.

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Witnesses:

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