No. 742,314. PATENTED OCT. 27, 1903.

J. A. HAMPTON & J. ROBERTS.

INGOT MANIPULATING MECHANISM FOR ROLLING MILLS.

APPLICATION FILED JAN. 28, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig 1.

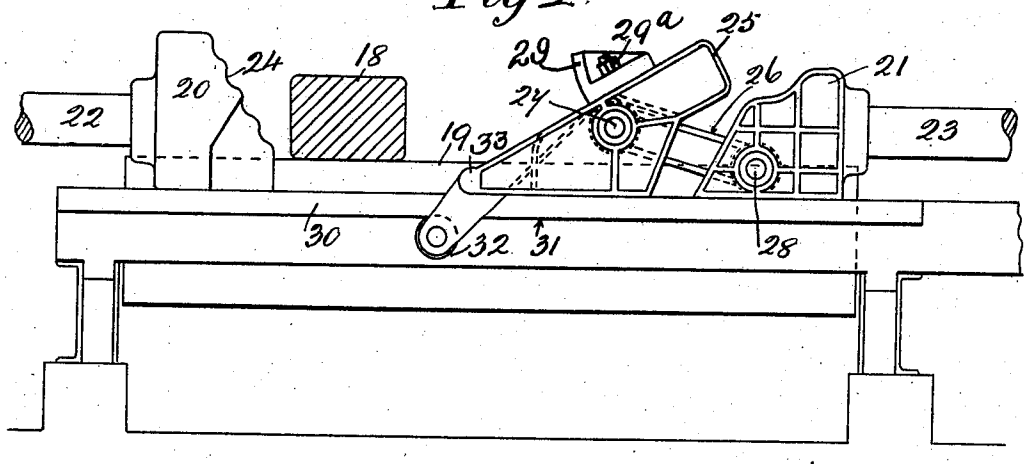
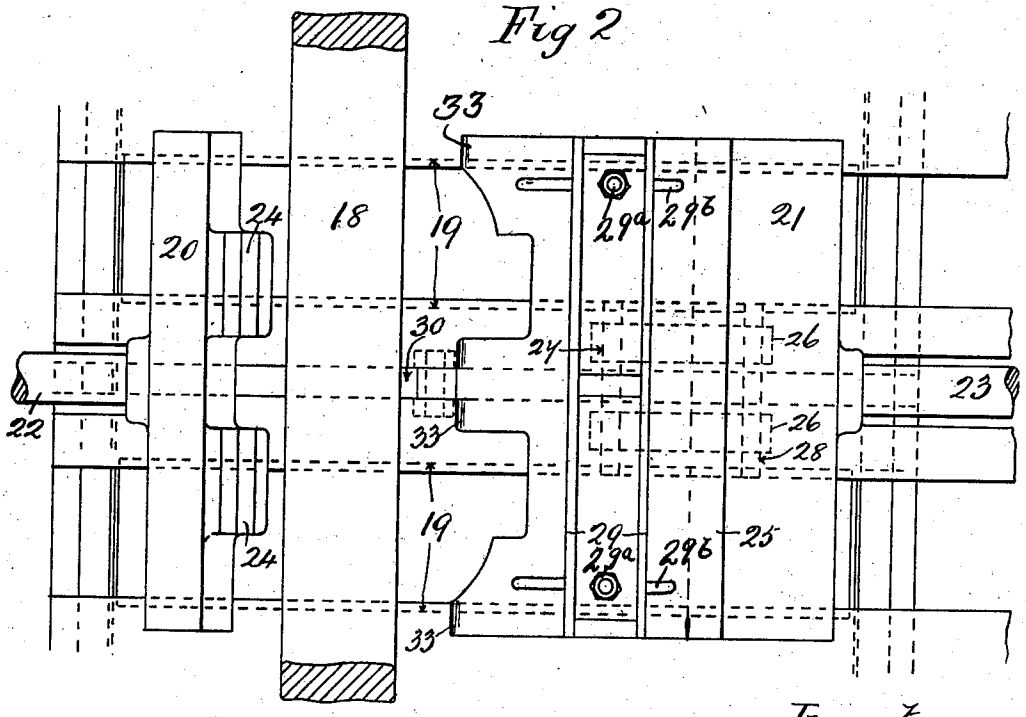


Fig 2



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NO MODEL. 4 SHEETS—SHEET 2.

Fig 3

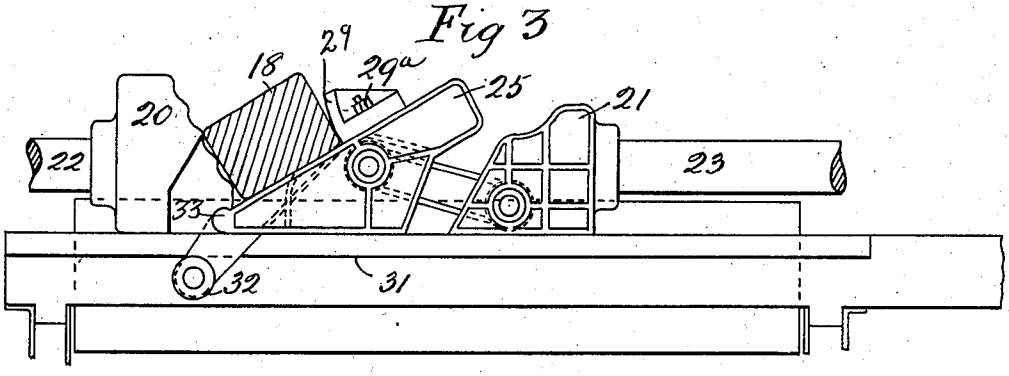


Fig 4

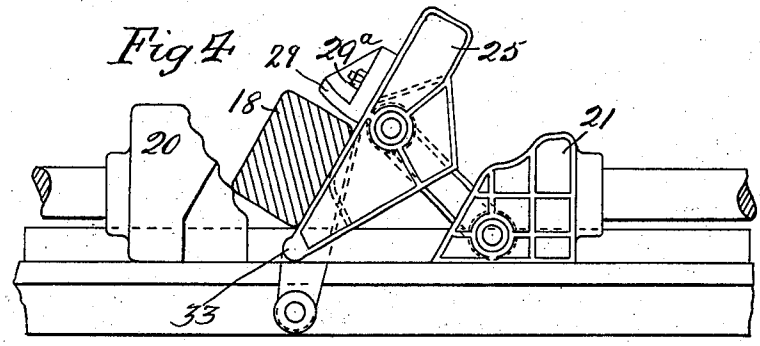
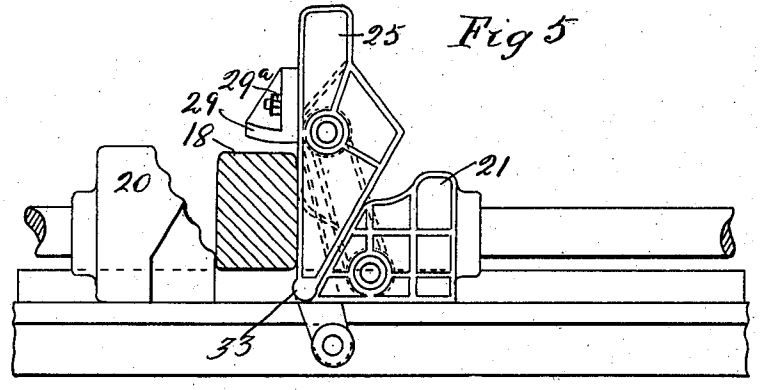


Fig 5



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NO MODEL. 4 SHEETS—SHEET 3.

Fig 6

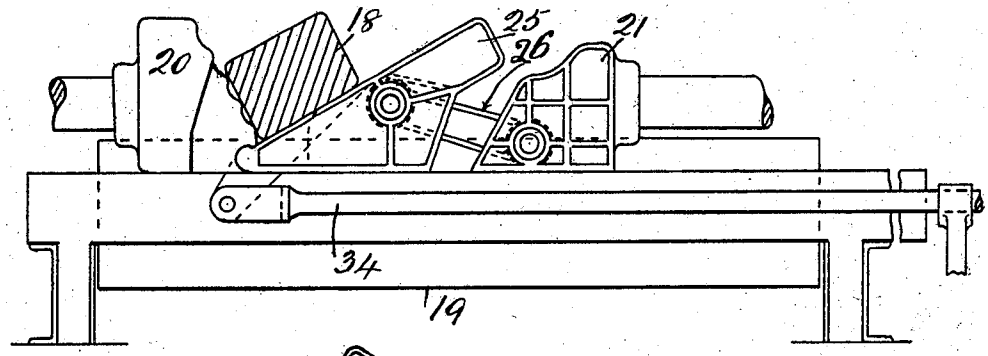


Fig 7

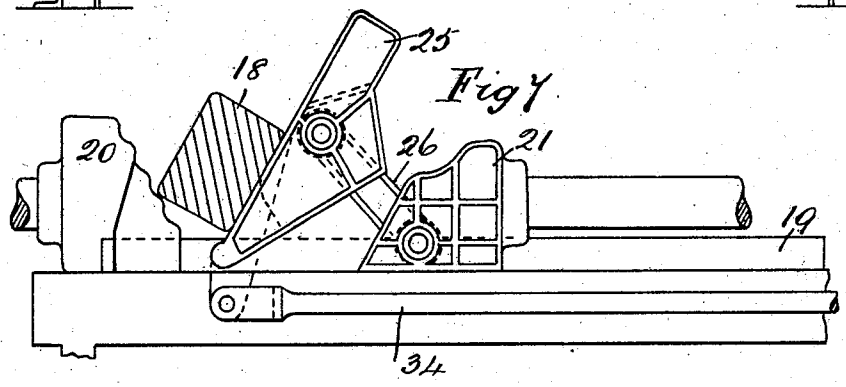
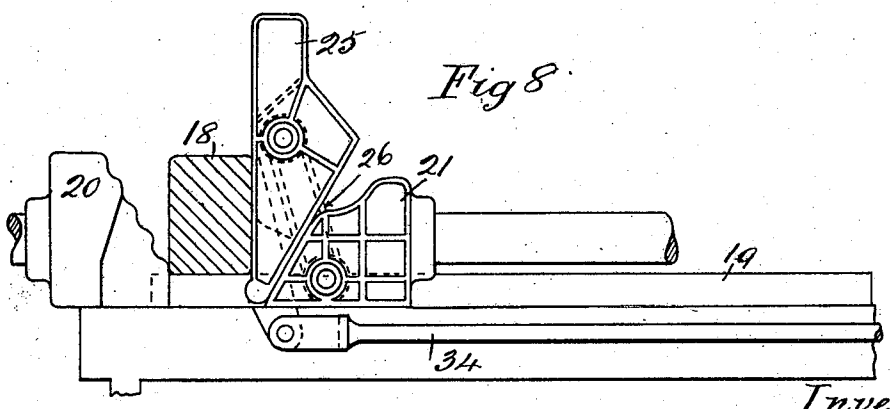


Fig 8



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NO MODEL. 4 SHEETS—SHEET 4.

Fig 9

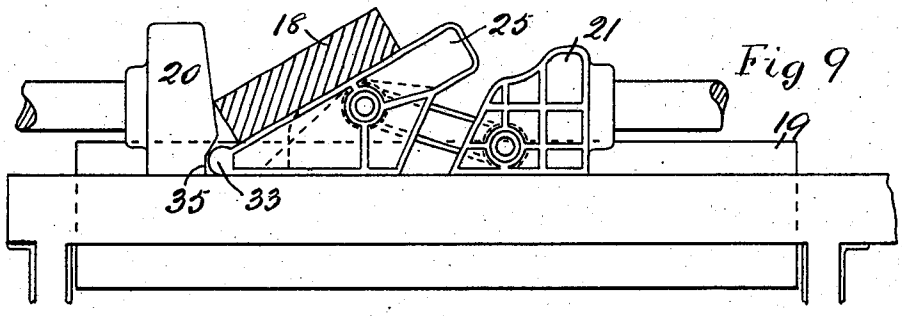


Fig 10

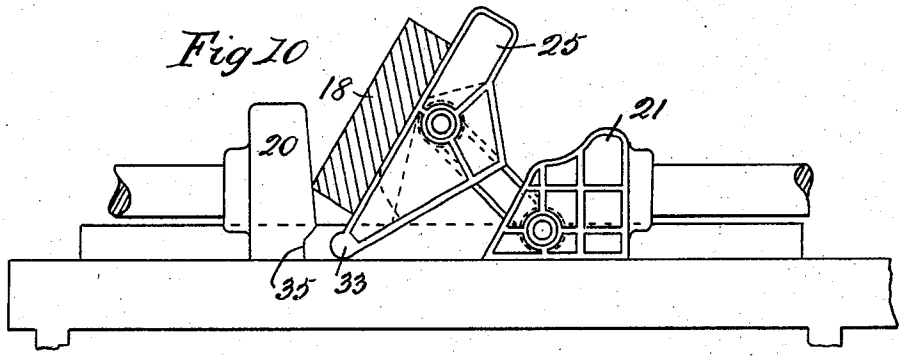
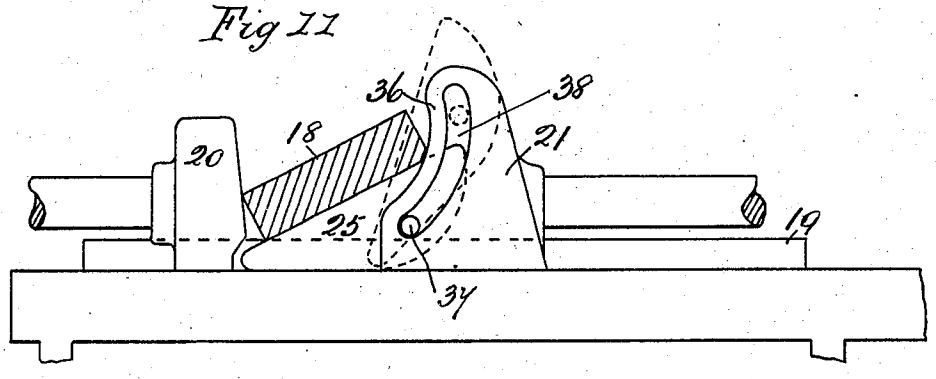


Fig 11



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No. 742,314. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

JOHN ARTHUR HAMPTON, OF HANDSWORTH, AND JAMES ROBERTS, OF WEST BROMWICH, ENGLAND.

INGOT-MANIPULATING MECHANISM FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 742,314, dated October 27, 1903.

Application filed January 28, 1903. Serial No. 140,926. (No model.)

To all whom it may concern:

Be it known that we, JOHN ARTHUR HAMPTON, a resident of 32 Sandwell road, Handsworth, and JAMES ROBERTS, a resident of Swan Foundry, West Bromwich, in the county of Stafford, England, subjects of the King of Great Britain, have invented new and useful Improvements in Ingot-Manipulating Mechanism for Rolling-Mills, of which the following is a specification.

Our invention relates to improvements in mechanism for turning over and otherwise manipulating ingots, blooms, billets, slabs, and the like pieces in connection with rolling-mills. Hereinafter the term "ingot" means any of such pieces.

Broadly, the object of the invention is to effect the required movements of the ingot by means of a peculiar contrivance which passes partly beneath the ingot, then imparts a raising movement to the said ingot, and finally turns the same over.

As is well known, in rolling-mills of this class live rollers are employed on either side of the rolls, which carry the ingot to and from the said rolls and between such rollers. The ingot is moved transversely to the several passes in the rolls by means of hydraulic rams or other suitably-arranged sliding rods or mechanism to give a to-and-fro motion to two opposing heads.

We have illustrated this our invention in the accompanying drawings, in which—

Figure 1 is a side view, and Fig. 2 a plan view, of the invention, showing the mechanism ready to operate upon the ingot. Figs. 3, 4, and 5 show the several operations of the mechanism upon the ingot. Figs. 6, 7, and 8 illustrate a modified arrangement whereby the tilting of the turning-over shoe may be effected. Figs. 9 and 10 illustrate a further modified arrangement, whereby the tilting of the turning-over head may be effected. Fig. 11 shows another modified arrangement, whereby the tilting of the turning-over head may be effected.

Similar numbers refer to similar parts throughout the several views.

18 is the ingot which is carried from the rolls upon and by the live rollers 19 in the usual well-known manner.

20 and 21 are movable heads, to each of which is given an independent to-and-fro movement, which may be done in any convenient manner and preferably by means of hydraulic pressure upon their respective rams 22 and 23. The head 20 preferably has its face formed with ribs 24. To the head 21 is connected the shoe 25 by means of the toggle-links 26, which are jointed at 27 and 28. Upon the face of the shoe is adjustably secured the stop 29, by means of bolts 29^a, working in the slots 29^b. The fore end of the shoe is carried through the slot 30 to the under side of the plate 31 and is there furnished with the roller 32, which rides against the under side of the plate along the side of the slot. Its action, therefore, is as follows: When the ingot 18 has proceeded from the rolls onto the live rollers 19, ready to be turned, the head 20 is advanced to it, and then the head 21 is brought forward, so that its nose 33 passes beneath it, and in so doing the ingot is forced up the face of the shoe, as shown in Fig. 3, until it reaches the stop 29. By the continued advance of the shoe-head 21 the shoe is lifted, as seen in Fig. 4, as it cannot proceed farther in a right line owing to the engagement between the head 20, the ingot 18, and the stop 29. By now receding the head 20 a little distance the ingot drops onto the rollers, having been turned at right angles. By again closing the two heads together, as seen in Fig. 5, the ingot may be pushed to the right or left to accommodate a successive return-pass in the rolls. If it is desired to give the ingot another quarter-turn, the operation is of course repeated.

Referring to Figs. 6, 7, 8, and 9, it will be seen that to the fore end of the shoe 25 we connect the rod 34 in place of the roller 32, previously described. This rod receives a backward-and-forward movement by any suitable means. Also in this case we may dispense with the stop 29, previously described. Hence when the shoe has been advanced beneath the ingot, as shown in Fig. 6, by slightly withdrawing the rod 34 and continuing the

forward movement of the head 21 the ingot will be tilted over in the same manner as previously explained and as shown in Fig. 8.

Referring now to Figs. 9 and 10, we have shown how we may, if desired, cause the tilting of the shoe as follows: The fore end 33 may butt against the lower part 35 of the head 20, (see Fig. 9,) and by the continued forward movement of the head 21 the shoe is raised, as shown in Fig. 10, when the subsequent movements may be made, as before described.

Referring now to Fig. 11, the head 21 is modified in shape, being provided with two side cheeks 36, between which the shoe 25 is carried by means of pivots 37 on each side of the shoe being made to travel in the slots 38 in the cheeks. Hence when the fore end 33 of the shoe butts against the head 20, with the ingot lying thereon, the shoe is tilted by reason of the pivots 37 traveling along the slots, as indicated by dotted lines.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In mechanism for turning over and otherwise moving ingots, blooms, billets, and the like, in connection with rolling-mills, the combination of two movable heads, a tilting shoe connected to one of such heads by a pivotal connection permitting an independent bodily movement of said shoe relative to such head, and suitable means, in operation, for causing said shoe to tilt, substantially as described.

2. In mechanism for turning over and otherwise moving ingots, blooms, billets, and the like, in connection with rolling-mills, the combination of a movable head 21, a shoe 25, connected to the head by means of links 26, an opposite head 20, and suitable means, in operation, for causing the said shoe to tilt, substantially as described.

3. The combination of movable head 21, a shoe connected thereto by links 26, an adjustable stop 29 secured on the face of the shoe, and an opposite head 20, substantially as described.

4. The combination with movable head 21, a shoe connected thereto by links 26, an adjustable stop 29 carried on said shoe, the plate 31 having the slot 30, and an extension of said shoe passing through slot 30 and having roller 32, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOHN ARTHUR HAMPTON.
JAMES ROBERTS.

Witnesses:
C. HAYWARD POWELL,
J. BERNARD HAYWARD.