E. W. DAVIES.

APPARATUS FOR MANIPULATION OF METAL INGOTS AND THE LIKE.

APPLICATION FILED SEPT. 19, 1917.

1,327,315.

Patented Jan. 6, 1920.

3 SHEETS—SHEET 1.

Fig.1.

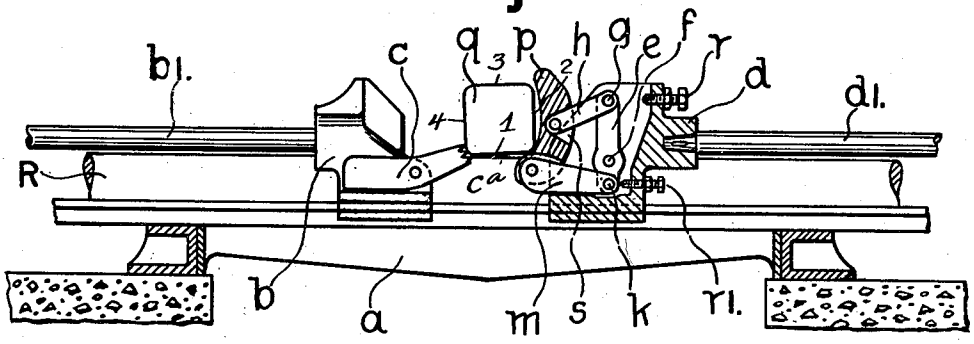


Fig.2.

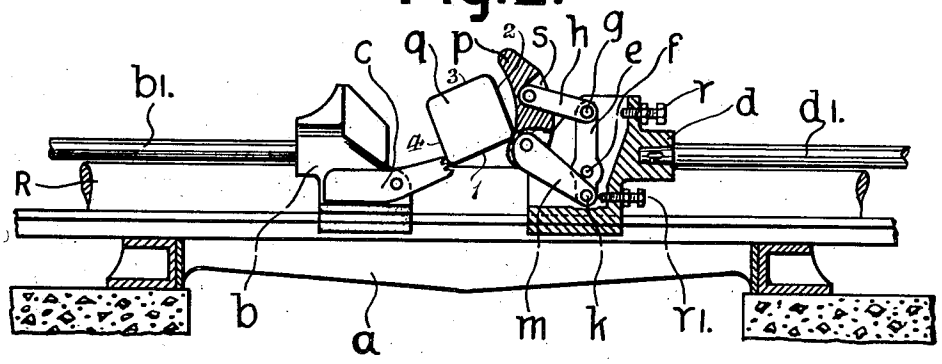
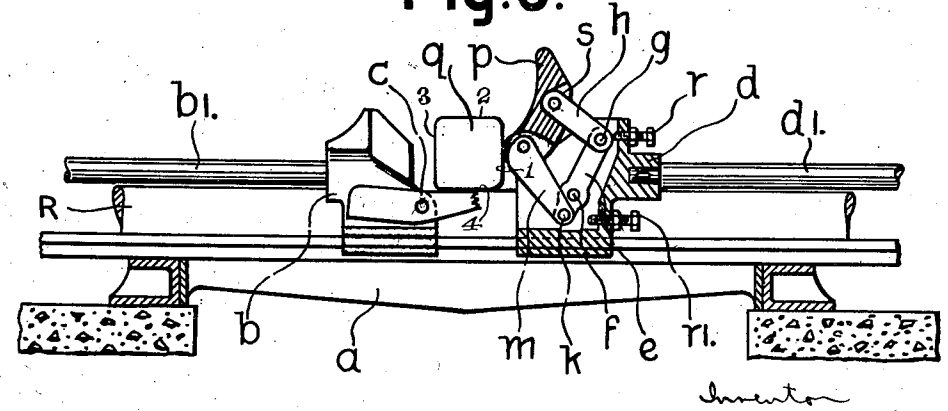


Fig.3.



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3 SHEETS—SHEET 2.

Fig. 4.

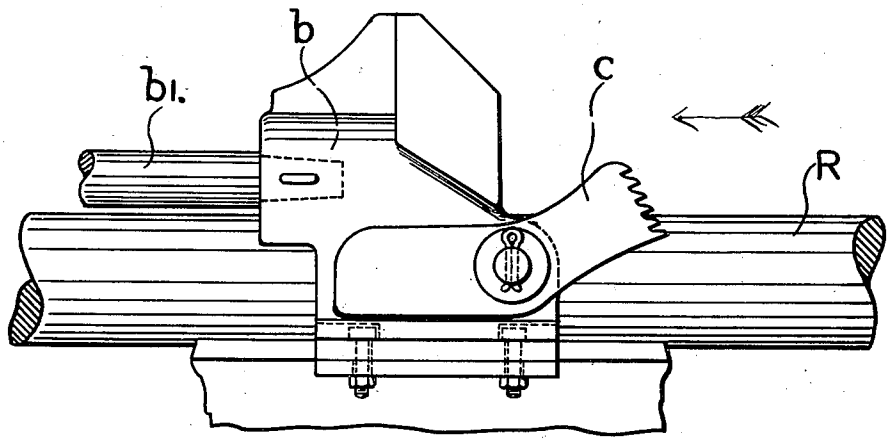
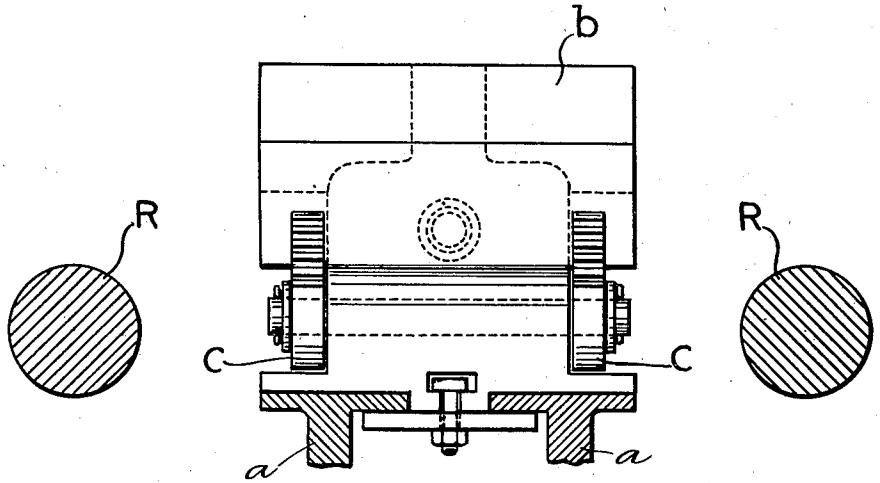


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 4a.

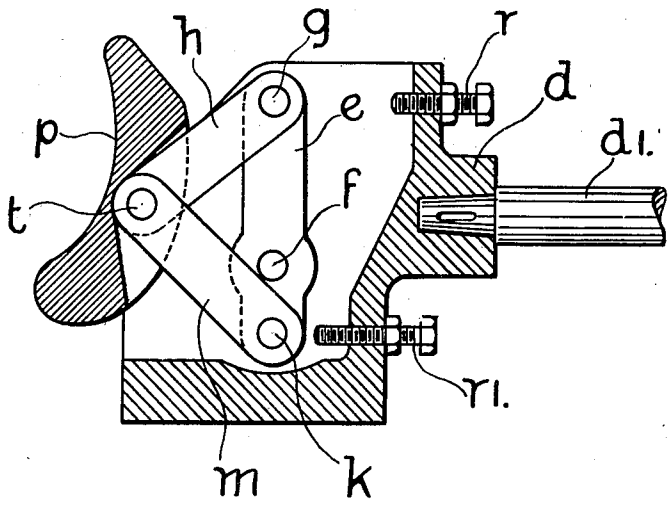
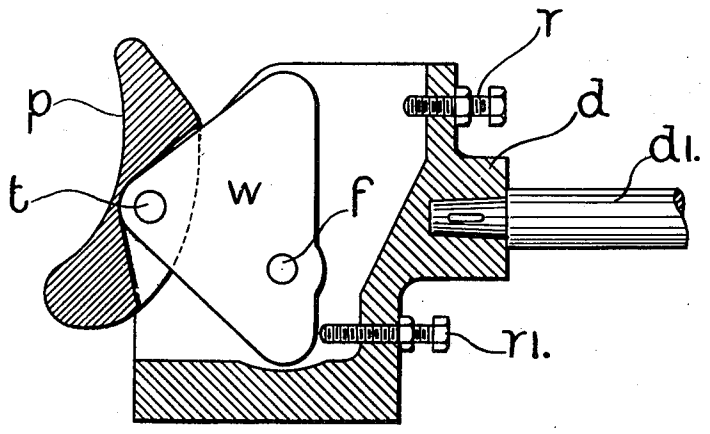


Fig. 5a.



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UNITED STATES PATENT OFFICE.

EVAN WALTER DAVIES, OF DOWLAIS, WALES.

APPARATUS FOR MANIPULATION OF METAL INGOTS AND THE LIKE.

1,327,315. Specification of Letters Patent. Patented Jan. 6, 1920.

Application filed September 19, 1917. Serial No. 192,156.

To all whom it may concern:

Be it known that I, EVAN WALTER DAVIES, a subject of the King of Great Britain and Ireland, and resident of 31 Balaclava road, Dowlais, in the county of Glamorganshire, Wales, have invented certain new and useful Improvements in a Combination of Appliances for the Apparatus for Manipulation of Metal Ingots and the like, of which the following is a specification.

This invention relates to appliances for the automatic manipulation of metal ingots and the like at rolling mills, and refers to improvements in or modifications of the invention for which I have made application for a patent in the United States of America, Serial No. 35668, filed 22nd June 1915.

An apparatus constructed according to my aforesaid invention provides an extremely efficient means for manipulating all sizes and classes of metal ingots, and enables them, where required to be turned automatically and in one operation through any required angle up to 180°.

The important and characteristic constructional features of my previous invention were the ingot contact members one of which the so called "receiving clutch" consisted of a serrated plate or plates pivoted to the upper portion of a counterbalanced framework, which was in turn pivoted in connection with a cross head operated by a piston rod.

The other ingot contact member consisted of the so called "ingot turning clutch", or impinging clutch, and it was controlled and operated by means of an arm, or lever, the said arm being pivoted in connection with a cross head controlled by another piston rod, in such a way that it (the arm) could tilt. The upper end of said arm was connected to the turning clutch by a link termed the "forearm" and the lower end of the tilting arm was connected through a link and a series of mechanism with the said turning clutch.

My present invention, while embodying these, the characteristic features of my aforesaid principal invention relates to a simplified construction of apparatus designed for use where it is not required to deal with ingots or the like of so many different sections, or to turn them through so large a range of angles as was the case with the apparatus particularly described and shown in my former specification.

The apparatus about to be described is particularly suitable for use in connection with cogging or roughing mills and is adapted to turn a bloom or ingot of simple section in one operation through an angle of as much as say about 90°.

According to my present invention, in the case of the first described contact member, in place of providing a serrated plate or plates pivoted to a counterbalanced framework which is in turn pivoted in connection with its corresponding cross head, I pivot one or several (preferably two) serrated plates or their equivalents to or in connection with the cross head.

As regards the other contact member, in place of pivoting the turning clutch or impinging clutch to the end of a link connected to the lower extremity of the arm or lever through a series of mechanisms, I pivot the said link directly to the turning clutch.

In order that my present invention may be clearly understood I will now proceed to describe with reference to the accompanying drawings, various forms of apparatus embodying my simplified construction.

Figure 1 is a side elevation partly in section of the improved apparatus in a position ready to turn an ingot.

Fig. 2 is a similar view with the parts in the position showing the ingot partly turned.

Fig. 3 shows the ingot fully turned.

Fig. 4 is a similar view and in somewhat greater detail of the left hand contact member.

Fig. 5 is a sectional elevation looking in the direction of the arrow Fig. 4.

Fig. 4^a is a sectional side elevation of a modified form of the turning clutch, drawn to a larger scale than Figs. 1–3.

Fig. 5^a is a similar view showing another modified form of the same portion of the apparatus.

The same numerals and letters of reference are employed to denote the same parts in all the views.

Between two of the conveying rollers R, in connection with the roughing or cogging mill, I provide transverse bed plates *a* acting as guideways.

Mounted so as to slide along these guideways are the two operating members. One of these consists of a cross head *b* operated by means of the piston rod b^1, and having

pivoted at each side thereof a serrated counterbalanced plate *c*. The construction and arrangement in the typical case will be clearly understood from Figs. 4 and 5. The plates *c* are enabled to dip downward but when the plates are released they return to their original positions.

The other sliding or operating member comprises a recessed cross head *d*, operated by a piston rod d^1. Pivoted within the recessed portion of the cross head *d* is the tilting arm *e* the pivot being at *f*.

Pivoted at *g* to the upper end of the tilting arm or lever *e* is a link *h* which is pivoted to the turning clutch *p*, the pivot being located in a recess *s* the wall of which also acts as stops for limiting the motion of the turning clutch *p*. Pivoted at *k* to the lower end of the arm *e* is a link *m*, which in turn is pivoted to the lower end of the turning clutch *p* in a suitable recess.

q shows a bloom or ingot, in this case of square section, which it is desired to turn. *r* are screw stops for the purpose hereinafter described.

The use of this form of the apparatus will be easily understood.

The bloom *q* traveling on the rollers R is brought into position in the ordinary way between the clutching members of the turning mechanism. The parts are now in the position shown at Fig. 1 with the side 1 resting on the plate C^a. On continuation of the pressure resulting from the movement imparted to said parts, including the clutches, through the referred to turning mechanism the bloom *q* is tilted up into position shown at Fig. 2, the sides 1, 2, 3 and 4 of the bloom then assuming the position indicated therein and on further continuing the pressure the side 4 of the bloom falls over on the top of the plate C^a the turning clutch *p* rising into the position shown at Fig. 3.

On separating the cross heads *b* and *d*, the counterbalanced plates *c* and the parts of the turning clutch resume their original positions.

The screw *r* screwing through the upper portion of the cross head *d* is intended to come into contact with the upper end of the arm *e* in order to limit its movement. The screw r^1 fulfils the same object at the other end of the arm *e*.

As previously stated, the conformation of the recesses in the part *p* limits the movement of the said part.

Referring to Fig. 6 which as previously stated shows a modified form of the turning clutch, in this case both the link *h* and the link *m* are carried to the same pivot *t* in the turning clutch *p*, the other details of construction remaining the same.

Fig. 7 shows a further modification. It will be evident that from a consideration of Fig. 6 when the links *h* and *m* are pivoted to the same pivot at *t* no relative turning movement can take place between the arm *e* and the links *h* and *m*, but that they turn as a rigid whole upon the pivot *f*. Fig. 7 shows the further modification based upon this consideration, in which figure, *w* is a heavy triangular plate preferably of cast metal, pivoted at *f* to the cross head *d* and at *t* to a turning clutch *p*, the other details of construction remaining the same.

It will be understood that other constructional variations may be introduced without departing from the scope of my claims.

The turning clutch may have a smooth or serrated contact surface and may be adapted in various ways to suit requirements. The contacting portions of the counterbalanced plate or plates on the other operating member may be of any suitable width and the serrations or the like may be arranged in any appropriate manner.

What I claim and desire to secure by Letters Patent of the United States of America is:—

1. In apparatus for manipulating ingots in rolling mills, a turning member comprising a cross head, means for operating said cross head, a lever pivoted to the said cross head, a clutching member, links connecting said clutching member to each end of the said lever substantially as described.

2. In apparatus for manipulating ingots in rolling mills, a turning member comprising a cross-head, an arm pivoted in said cross-head, a turning clutch provided with a recess in its upper portion, a link pivoted to said clutch within said recess and connected to the upper end of said arm and a second link connected to the lower end of said pivoted arm and to the corresponding end of said clutch.

3. In apparatus for manipulating ingots in rolling mills, a turning member comprising a cross-head, an arm pivoted in said cross-head, a turning clutch provided with a recess in its upper portion, a link pivoted to said clutch within said recess and connected to the upper end of said arm, a second link connected to the lower end of said pivoted arm and to the corresponding end of said clutch, a second cross-head, means for operating said second cross-head and serrated counter-balanced members pivoted to said second cross-head.

In testimony whereof I affix my signature in presence of two witnesses.

EVAN WALTER DAVIES.

Witnesses:

BENJAMIN DAVIES,

RHYS HENRY PRICE.