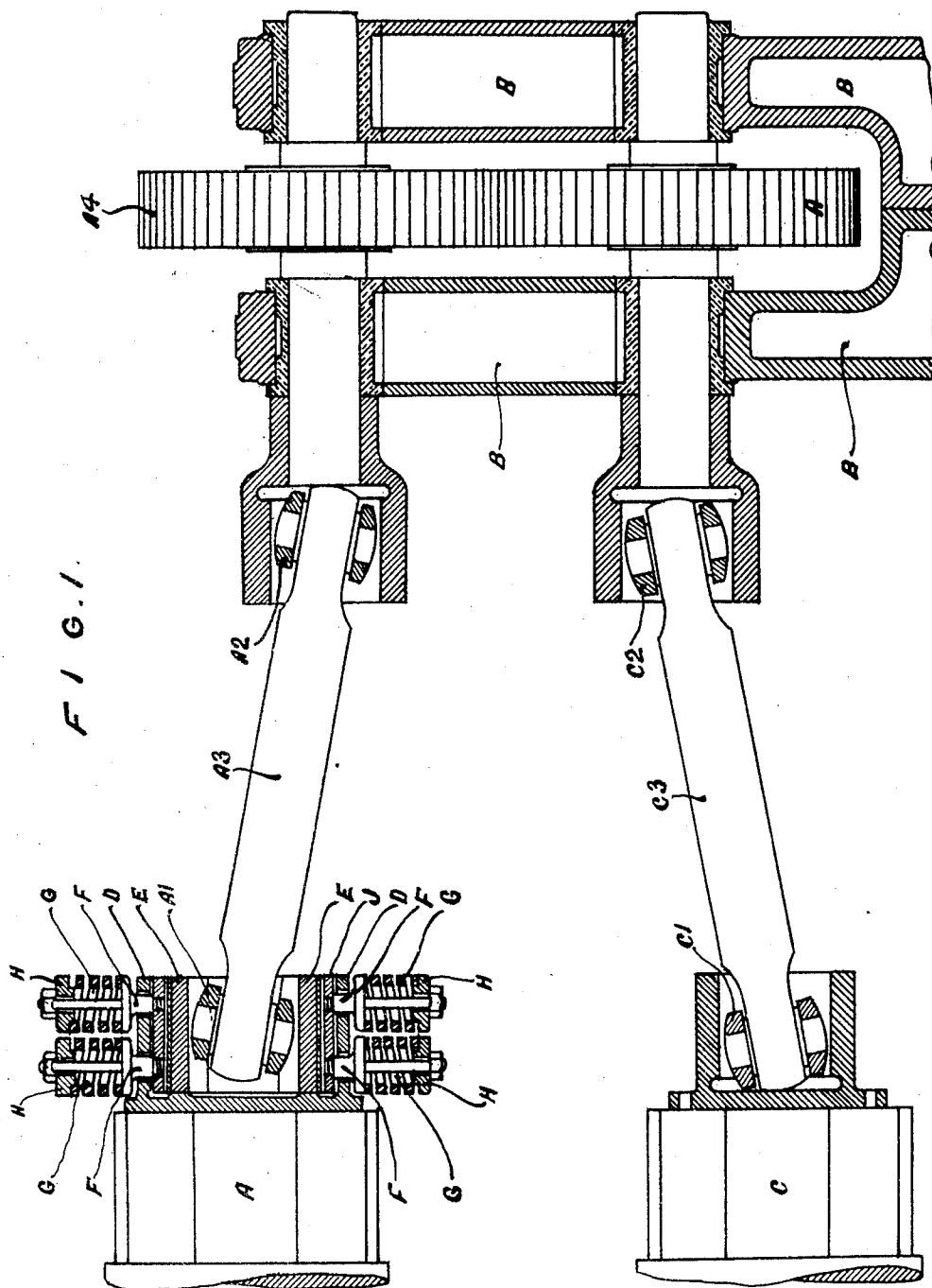


1,342,264.

Patented June 1, 1920.

2 SHEETS—SHEET 1.



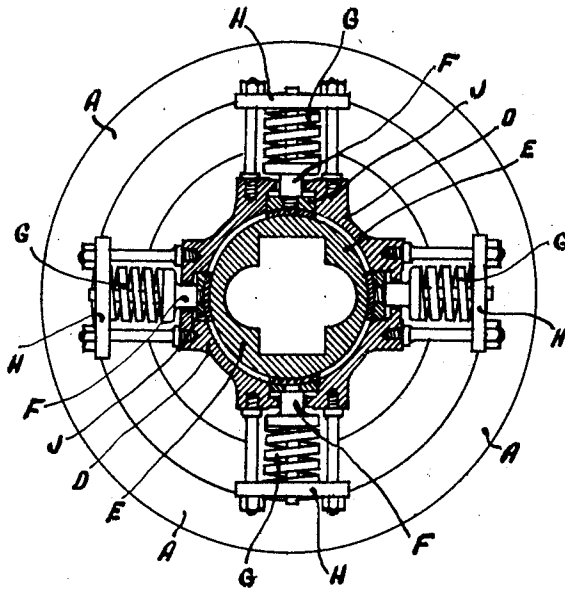
INVENTOR
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T. E. HOLMES.
CONNECTION WITH PLATE AND LIKE ROLLING MILLS.
APPLICATION FILED MAY 15, 1918.

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2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

THOMAS EDMUND HOLMES, OF GLASGOW, SCOTLAND.

IMPROVEMENT IN CONNECTION WITH PLATE AND LIKE ROLLING MILLS.

1,342,264.

Specification of Letters Patent.

Patented June 1, 1920.

Application filed May 15, 1918. Serial No. 234,783.

To all whom it may concern:

Be it known that I, THOMAS EDMUND HOLMES, a subject of the King of Great Britain and Ireland, and a resident of Glasgow, Scotland, have invented certain new and useful Improvements in Connection with Plate and like Rolling Mills, of which the following is the specification.

In plate and like rolling-mills in which the upper roll of the finishing or equivalent pair of rolls is driven, any small difference there may be between its surface speed and that of the plate and lower roll leads to surface marking—and it is a practical impossibility that the surface of the rolls and the pitch line of gear wheels which drive them should at all times coincide. On the other hand, where the upper roll has not been driven positively but only by frictional contact between it and the lower roll and the plate being rolled this fact limits the thickness of plate passed, because in order that the upper roll may be moving when the plate enters, it must previously to that rest upon the rotating lower roll. Therefore at the entry of the plate, the upper roll must rise the thickness of the plate. Obviously, this practically instantaneous rise of the heavy upper roll imposes in any case a severe shock upon the machine and limits the speed of rolling and thickness of the pass to such as will give a shock not in excess of that the machine can withstand.

The invention has for its object to obviate these disabilities and to provide means whereby the speed of rolling and thickness of pass may be increased without shock.

According to the invention the upper roll is positively driven through gearing at all times at approximately the proper surface speed. Thus the necessity for lowering it into contact with the lower roll in order to maintain its surface speed is obviated. But in order that marking of the plate owing to the surface speed of the roll not being absolutely correct may be avoided, there is interposed in the train of gearing by which it is driven a frictional slipping device the capacity of which is such that it is capable of driving the upper roll when no work is in the mill, but which slips either positively

or negatively as the case may be when a plate is being rolled and thus corrects any inequality of surface speed due to the gearing which drives it. That is to say, the slipping device is such as to positively drive the roll light, but to slip under the added stress of an inequality in surface speed—if there be such. The upper roll may be driven in approximate consonance with the lower roll by any convenient arrangement of gearing.

An illustrative example of an arrangement of gearing and friction device is shown on two accompanying sheets of drawings, Figure 1, Sheet 1, being a sectional elevation, while in Fig. 2, Sheet 2, there is shown a sectional end elevation of the frictional device.

In this example the upper roll A is connected through universal couplings A¹, A² and a universal shaft A³ to a gear wheel A⁴ mounted in a housing B and with which there gears a gear wheel C⁴ mounted in the housing and connected to the lower roll C by universal couplings C¹, C² and a universal shaft C³.

The frictional clutch device is arranged adjacently to the upper roll A and consists of an internally cylindrical member D fast on the spindle of the roll A and embracing the externally cylindrical surface of the outer member E of the coupling A¹. In the member D are a series of radially arranged plungers F pressed inward by springs G arranged between collars upon them and crossheads H secured to the member and bearing at their inner ends upon pads J surfaced with frictional material and which bear upon the cylindrical surface of the member E. The pressure of the springs G is adjusted by means of the crossheads H so that slip commences upon a predetermined torque being reached.

Obviously, very considerable variation may be made in the form and position of the frictional clutch device and in the arrangement of gearing without departing from the spirit of the invention.

What I claim is:—

In plate or like rolling mills, a roll and a driving connection therefor comprising con-

centric driving and driven cylinders, a series of radial spring-pressed plungers carried by one of said cylinders, and friction pads pressed by plugs against the other cylinder, together with means for adjusting the pressure of said springs.

In testimony whereof I have signed my

name to this specification, in the presence of two subscribing witnesses.

THOMAS EDMUND HOLMES.

Witnesses:

WILFRED HUNT,
JAMES EAGLESOM.