

July 25, 1939.

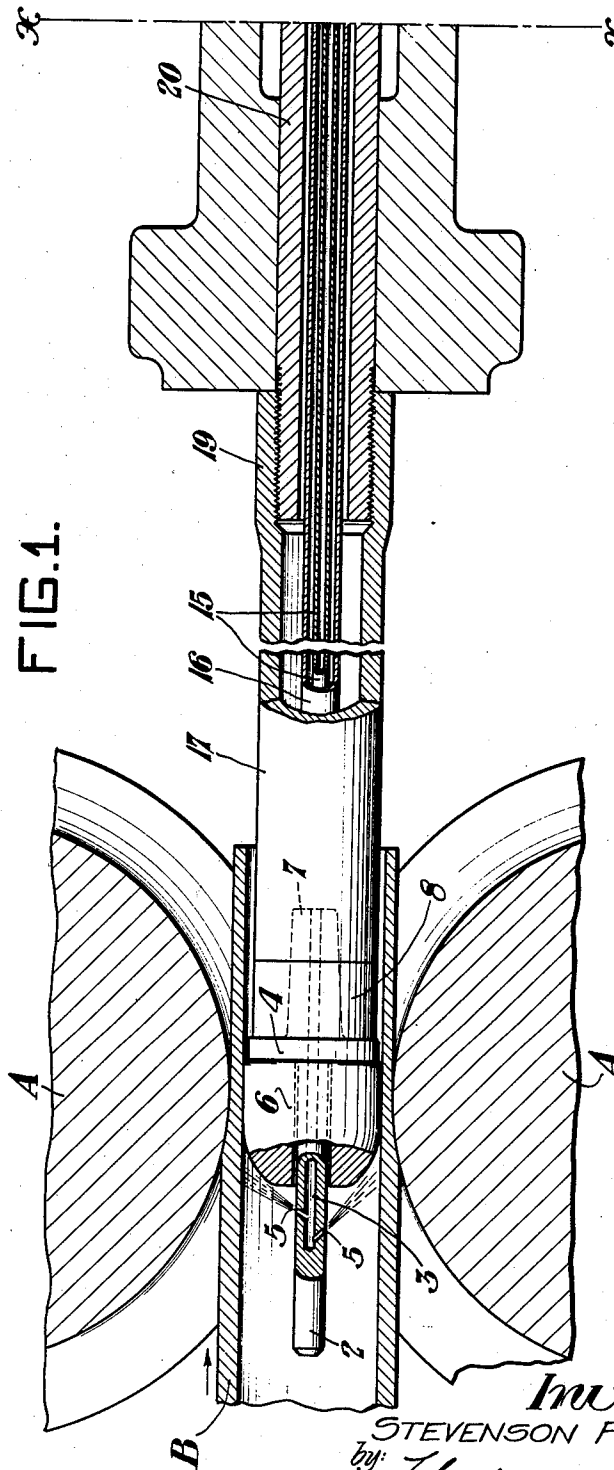
S. FINDLATER

2,167,418

PIPE OR TUBE ROLLING

Filed Jan. 21, 1937

3 Sheets-Sheet 1



Inventor:
STEVENSON FINDLATER,
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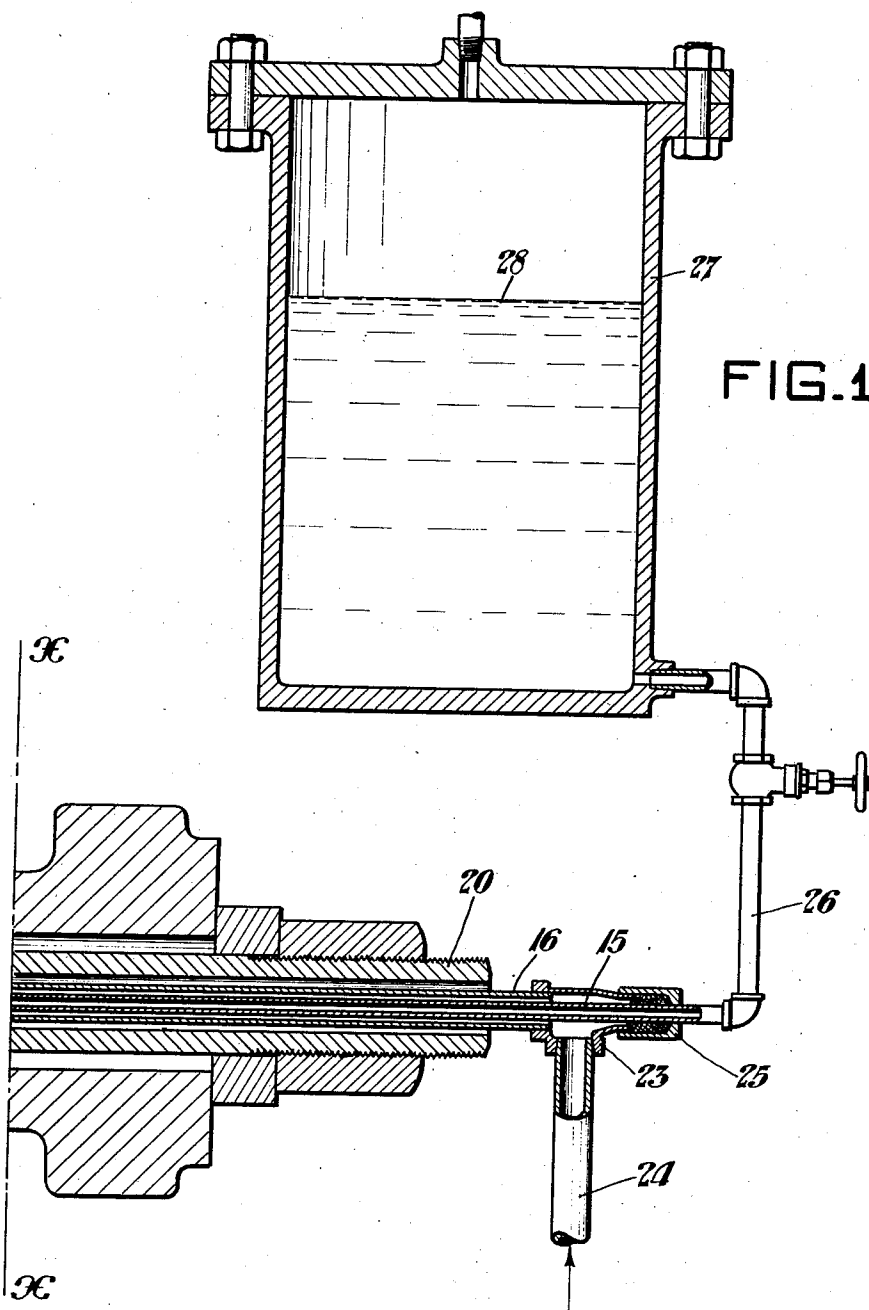
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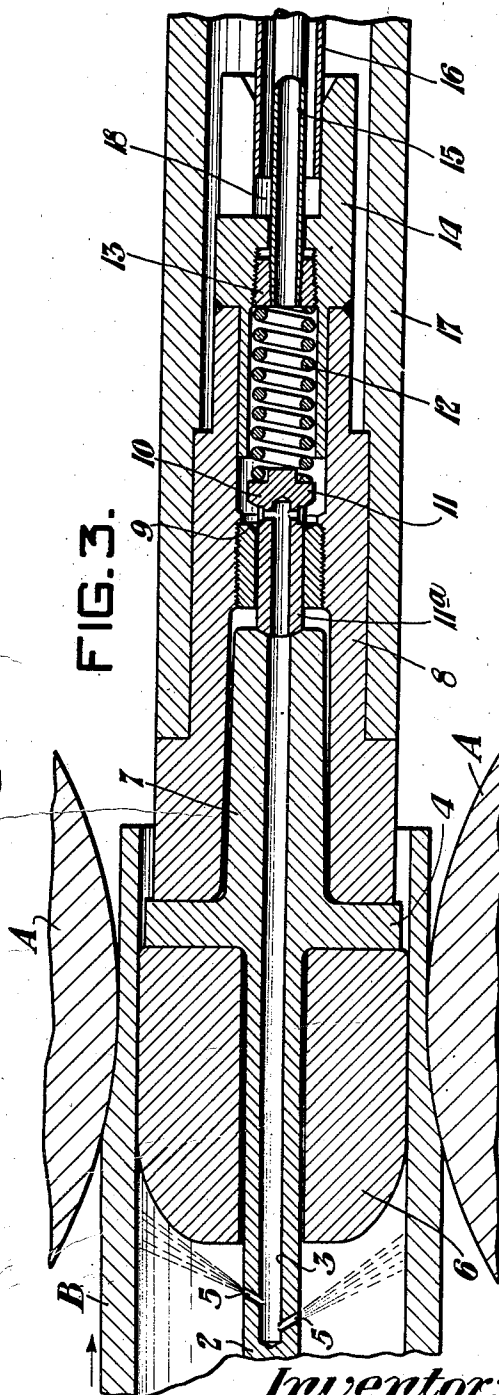
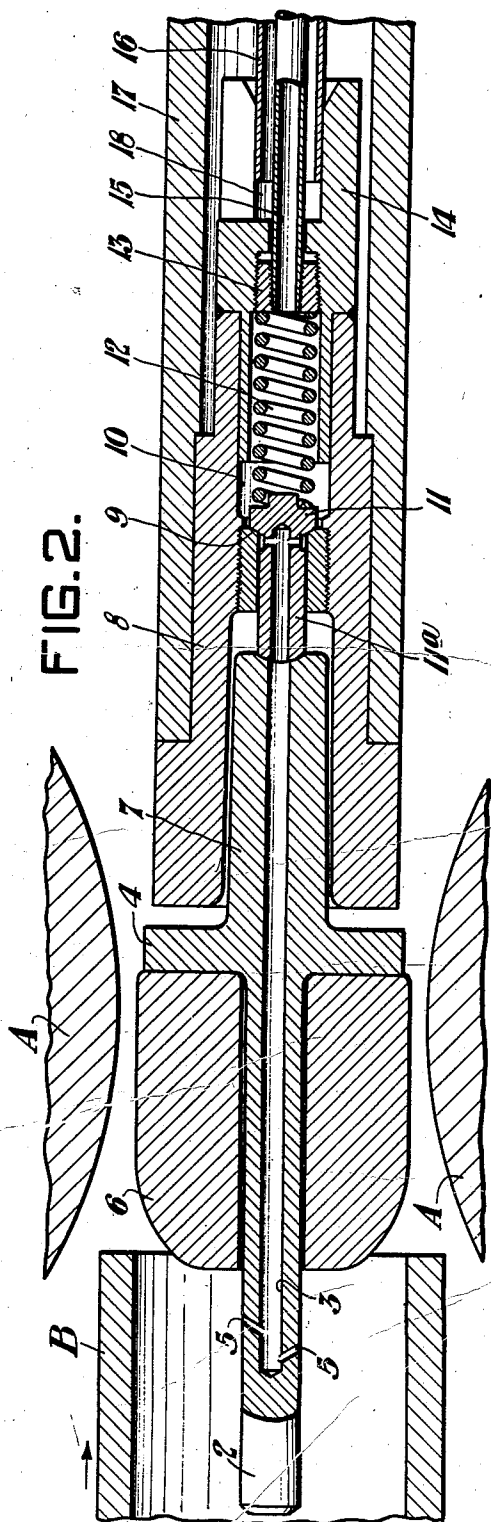
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,167,418

PIPE OR TUBE ROLLING

Stevenson Findlater, McKeesport, Pa., assignor
to National Tube Company, a corporation of
New Jersey

Application January 21, 1937, Serial No. 121,660

2 Claims. (Cl. 80—13)

This invention relates to the rolling of tubes and, more particularly, to a novel method and apparatus for internally lubricating tubes while being rolled.

In the art of rolling pipes or tubes it has hitherto been the practice to roll the pierced or tubular blank over a plug. This has resulted in severe wear on the plug and scratches on the interior surface of the tubular blank. Various attempts have been made to overcome these difficulties. The most common expedient is to station a man at the inlet side of the mill whose duty it is to place a small quantity of coal dust or salt in the tubular blank just prior to the insertion of the plug. Due to the heat of the tubular blank, combustion immediately takes place, and consequently very little lubricating effect is obtained, and that only for a short distance from the end thereof.

It is accordingly an object of my invention to provide a novel method and apparatus for efficiently lubricating the interior of tubular blanks during the rolling thereof.

It is a further object of my invention to provide a novel apparatus for continuously and automatically lubricating tubular blanks while being rolled.

The foregoing and further objects will be apparent after referring to the drawings in which:

Figures 1 and 1a are longitudinal sectional elevations of the apparatus of the invention;

Figures 2 and 3 are fragmentary sectional elevations of part of the apparatus of Figure 1 but showing the same in two distinct working positions;

In the drawings, the letter A designates a pair of "plug mill" rolls adapted to roll a tubular blank B by drawing it over the improved plug of the apparatus of my invention. The numeral 2 designates a plug bar having plug 6 disposed thereon. A bore 3 communicates with a plurality of apertures 5 which are directed rearwardly at a point adjacent the plug 6 so that fluid forced through the apertures 5 will be directed on the blank B just prior to its contact with the plug member 6.

The rear end 7 of the plug bar 2 is adapted to be reciprocally disposed within a sleeve 8 having a valve seat 9 and valve chamber 10 therein. A valve 11, reciprocally mounted in valve chamber 10, seats on the valve seat 9 and is normally held in contact therewith by a valve spring 12 held within the chamber 10 by a hollow plug 13 within a sleeve 14, the latter being suitably secured to the sleeve 8. A valve stem 11a is connected to the valve 11 and extends forwardly therefrom

through the valve seat 9 and is engaged by the rear end 7 of the plug bar 2 when inserted within the sleeve 8, so that the forward end of sleeve 8 contacts a shoulder 4 on the plug 6.

The foregoing elements are carried by a mandrel bar 17 which extends into the rolls A.

Concentrically disposed within the mandrel bar 17 and secured within the sleeve 14 are concentrically disposed telescoped pipes 15 and 16. The inner pipe 15 is secured to the hollow plug 13 and the outer pipe 16 is secured to the sleeve 14. The sleeve 14 has apertures 18 therein which allow egress of cooling fluid delivered through the pipe 16.

The rear end 19 of the mandrel bar 17 is expanded and has secured thereto a hollow bar 20 concentrically disposed over the telescoped pipes 15 and 16 so that cooling fluid delivered through the pipe 16 and apertures 18 is returned through the passageway between the pipe 16, mandrel bar 17 and the hollow bar 20.

The outer pipe 16 is connected to a suitable source of cooling fluid by a coupling 23 and pipe 24. The inner pipe 15 extends through and beyond the coupling 23 and a stuffing box 25. The extended end 26 of the inner pipe 15 is connected to a reservoir 27 in which a suitable lubricating fluid 28 is contained under pressure.

In operation it will be seen that the lubricating fluid 28 is forced under pressure to the valve 11 which is normally held closed by the valve-spring 12. However, when the workpiece is forced into contact with the plug 6, the valve stem 11a is engaged by the end of plug-bar 2, opening the valve 11 and permitting the lubricating fluid to pass through the bore 3, thence through the apertures 5 and onto the entire inner circumference of the workpiece just prior to its contact with the plug 6.

I have found that heated tar, due to its heavy body, is a very satisfactory lubricating fluid for this purpose but numerous lubricating oils will produce excellent results.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of my invention, as defined by the following claims.

I claim:

1. In an apparatus for interiorly supporting and lubricating tubular blanks while being rolled, a mandrel bar, a plug bar reciprocally mounted on the forward end of said mandrel bar, said plug bar having a bore and a plurality of apertures

adjacent the forward end thereof which communicate with said bore, said mandrel bar having a valve chamber adjacent the rearward end of said plug bar, a valve in said chamber, means for
5 supplying a lubricant under pressure to said chamber, and means responsive to the reciprocation of said plug bar for operating said valve.

2. In an apparatus for interiorly supporting and lubricating tubular blanks while being rolled,
10 a mandrel bar, a plug bar reciprocably mounted on the forward end of said mandrel bar, said plug bar having a bore and a plurality of aper-

tures adjacent the forward end thereof which communicate with said bore, said mandrel bar having a valve chamber adjacent the rearward end of said plug bar, a valve in said chamber, means for supplying a fluid under pressure to said
5 valve chamber, and a spring-biased valve in said chamber having a stem engaged by said plug bar, said valve being operable to open position by the pressure of a work-piece against a plug carried by said plug bar.

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