Feb. 6, 1923. 1,443,953

P. J. HOENSCHEID.

MACHINE FOR HOT ROLLING TWIST DRILLS.

FILED AUG. 30, 1918

Fig. 2.

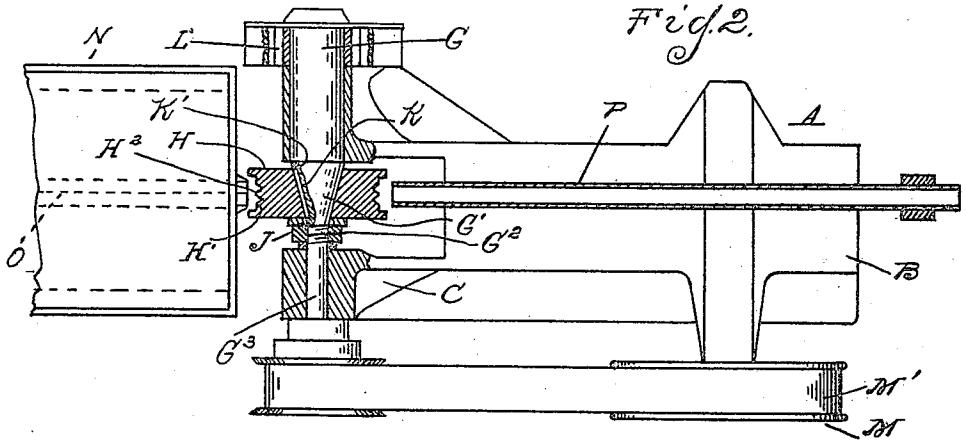


Fig. 1.

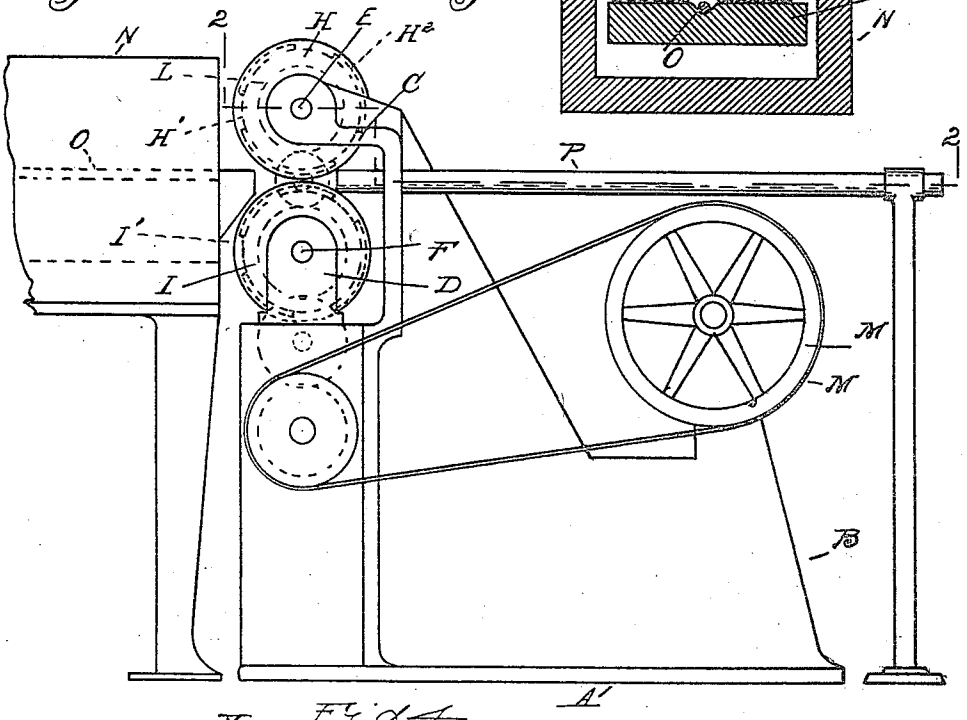
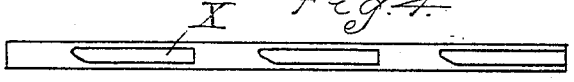


Fig. 3.

Fig. 4.



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Patented Feb. 6, 1923. 1,443,953

UNITED STATES PATENT OFFICE.

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MACHINE FOR HOT-ROLLING TWIST DRILLS.

Application filed August 30, 1918. Serial No. 252,002.

To all whom it may concern:

Be it known that I, PETER J. HOENSCHEID, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Machines for Hot-Rolling Twist Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to a machine for hot rolling twist drills. Heretofore it has been the usual practice to heat the stock in a furnace located at a remote distance from the rolling machine and then to transfer the heated stock from the former to the latter. Due to the fact that the stock for twist drills is high speed steel and high heat is necessary to properly work this steel the blank was usually too cold to be properly rolled by the time it reached the rolling machine. This was particularly true in the case of stock of small diameter. Previously it was considered impracticable to roll twist drills having less diameter than three-quarters of an inch so that these drills were formed by milling operations which is objectionable; first, because the twist drill made in this manner has not the desired toughness and hardness and; second, because of the increased cost of manufacture.

My machine avoids these objectionable features by locating the outlet of the furnace in close proximity to the rolls and by the novel construction whereby the heated stock is guided directly from the furnace into the rolls. With my machine drills of smaller diameter than three-quarters of an inch, such as drills of three-sixteenths of an inch diameter, can be easily hot-rolled. Another object of the invention is to obtain means for evenly cooling the drill blanks after having passed through the rolls and thereby preventing bending or distortion of the same. A further object is to obtain means for forming a multiple of impressions in the stock during one revolution of the rolls. Other objects reside in the novel arrangements and combinations of parts as more fully hereinafter set forth.

In the drawings:

Figure 1 is a side elevation of the machine embodying my invention;

Figure 2 is a cross section on the line 2—2 of Figure 1;

Figure 3 is a cross section through the furnace;

Figure 4 is a plan view of the stock after passing through the machine.

A is the rolling machine having the base B and the bifurcated upwardly-extending arms C and D arranged in pairs. E and F are spindles rotatably mounted in the bifurcated arms C and D respectively. Each spindle is provided with the enlarged bearing portion G which is rotatably mounted in one of the arms, with the tapering portion G′ located intermediate the arms, with the threaded portion G^2 at the smaller end of the tapering portion G′, and with the bearing portion G^3 of less diameter than the threaded portion G^2. These spindles are adapted to be longitudinally withdrawn from the bifurcated arms by withdrawing the enlarged bearing portion G first. Removably mounted upon the spindles E and F are the cooperating rolls H and I respectively, each roll having a tapering portion corresponding to the tapering portion G′ of the spindles. For holding these rolls in non-rotatable engagement with the tapering portions of the spindles the nuts J are provided, threadedly engaging the threaded portions G^2 of the spindles and adapted to force the rolls onto the tapering portions G′. The rolls may also have the keys K for engaging key-ways K′ in the tapering portions G′ of the spindles. Suitable driving mechanism, such as the train of gears L, driven in any suitable manner, as from the pulley wheel M through the belt M′, are provided for rotating the spindles and their corresponding rolls, the spindles being rotated at the same speed.

The rolls H and I have the peripheral grooves H′ and I′ respectively for engaging the stock and the circumference of each roll is equal to the length of a plurality of drills plus the allowance for cutting off and pointing the same. The rolls have the peripheries of their grooves each formed with a series of equally-spaced corresponding projections H^2 which are adapted to form the impressions X in the stock (shown in Figure 4). The peripheral portions between these projections perform no work on the stock and the length of these peripheral portions is sufficient to allow for the drill shank and the cutting off and pointing of each drill. With this construction it is readily seen that upon

each revolution of the rolls, a multiple of drills is formed. The stock passing through the rolls has a total length equal to the circumference of the rolls, so that no stock is wasted.

A suitable set of rolls for each size of stock may be easily placed on the spindles and in each instance the rolls have a circumference equal to a multiple length of the drills to be formed plus the allowance for cutting off and pointing the same.

N is the furnace having the bed N′ therein with the central longitudinally extending V-shaped groove O in its upper surface. The stock O′ when being heated lies upon the upper surface of the bed N′. The V-shaped groove O is located exactly in alignment with the grooves H′ and I′ to pass between the rolls H and I, and the outlet end of the furnace N is located in close proximity thereto. The stock O′, when heated to the desired temperature, is rolled into the groove O and forced longitudinally thereof out of the furnace into the grooves in the rolls which will move the same longitudinally and make the impressions G on opposite sides thereof.

For the purpose of evenly cooling the drill blanks after having passed through the rolls, the pipe P is provided with the lower side of its interior in alignment with the grooves H′ and I′ between the rolls, this pipe having a length sufficient for supporting the drill blank for its entire length. The pipe P preferably has an interior diameter slightly greater than the diameter of the formed drill blank. The stock will pass into this pipe P and lie therein and have a bearing surface for its complete length and be cooled evenly whereby the stock is prevented from bending or becoming distorted.

The outlet end of the furnace N being in close proximity to the rolls H and I will tend to heat the same thereby further preventing the too rapid cooling of the blanks after having passed from the furnace.

What I claim as my invention, is:

1. In a machine for hot-rolling drills, the combination with a pair of grooved rolls, one of said rolls having the periphery of its groove provided with a projection for forming a corresponding impression in the drill stock, of a furnace in close proximity to said rolls, and a bed in said furnace having a groove for guiding the drill stock directly into the roll grooves.

2. In a machine for rolling twist drills, the combination with a pair of rolls having cooperating grooves in their peripheries, said grooves having a plurality of equally-spaced corresponding projections thereon, of a furnace having a V-shaped groove in its upper surface, said groove being in alignment with said grooves between said rolls and extending to adjacent said rolls.

3. In a machine for hot-rolling drills, the combination with a pair of grooved rolls, the peripheries of said grooves having corresponding projections thereon for forming corresponding impressions in the drill stock, of a pipe the lower side of the interior of which is in alignment with said grooves and extending into close proximity thereto for receiving the drill stock after passing through said rolls.

4. In a machine for hot-rolling drills, the combination with a base having bifurcated arms, of a pair of spindles engaging and rotatably mounted in said arms and longitudinally removable therefrom, and cooperating rolls non-rotatably mounted on said spindles.

5. In a machine for hot-rolling drills, the combination with a base having bifurcated arms, of spindles rotatably mounted in said arms and longitudinally removable therefrom, said spindles provided with tapering portions, cooperating rolls mounted on said tapering portions, and means for clamping said rolls thereon.

6. In a machine for hot-rolling drills, the combination with a pair of grooved rolls, the peripheries of said grooves provided with means for forming impressions in the drill stock, of a pipe having an interior diameter slightly greater than the diameter of the formed drill stock, the interior of said pipe being in substantial alignment with said groove and extending into close proximity thereto for receiving the formed drill stock.

In testimony whereof I affix my signature.

PETER J. HOENSCHEID.