

A. W. GILLESPIE.
 BAR TWISTING MACHINE.
 APPLICATION FILED SEPT. 23, 1912.

1,123,518.

Patented Jan. 5, 1915.

Fig. 1

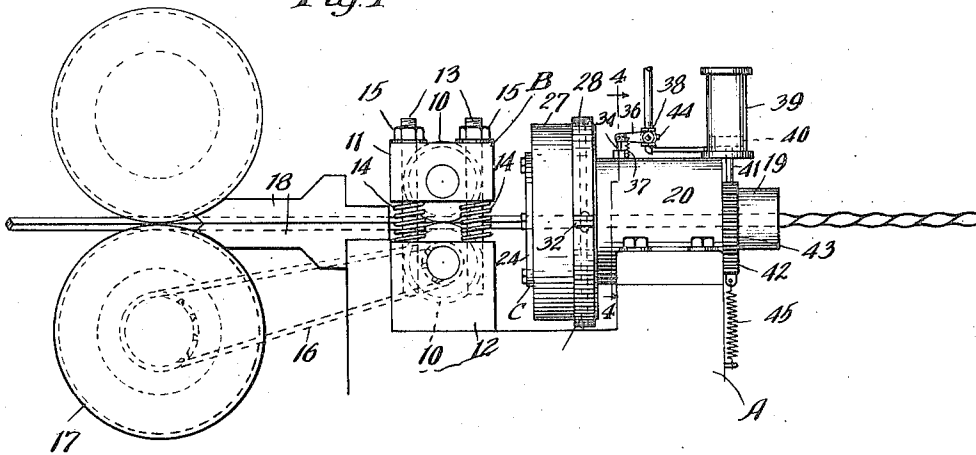


Fig. 3

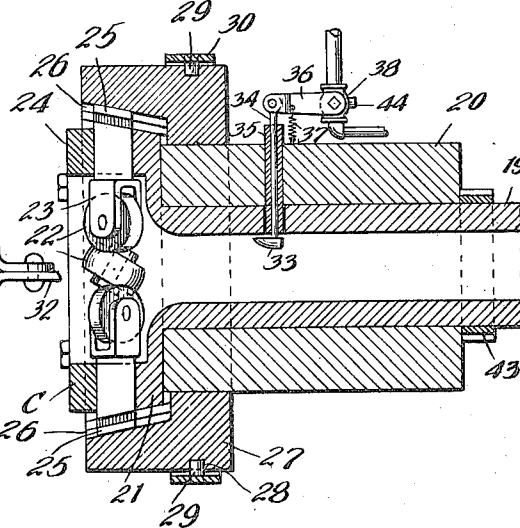


Fig. 2

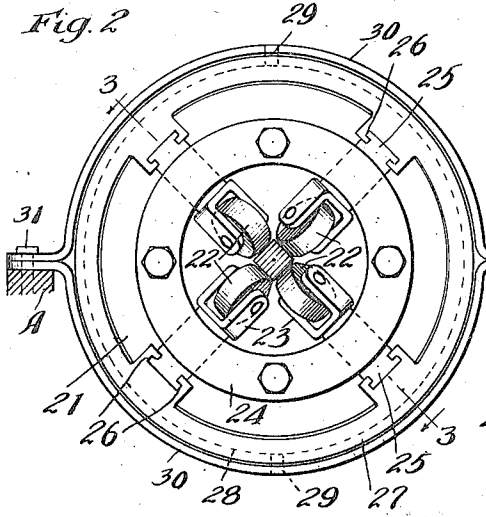


Fig. 4

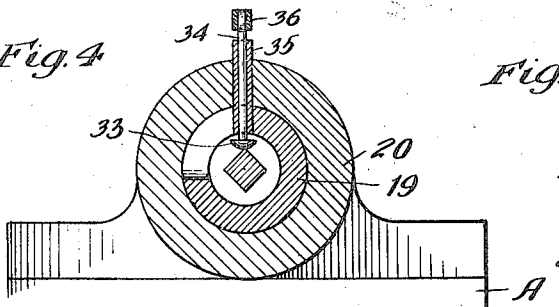
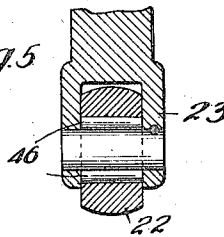


Fig. 5



Witnesses:

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UNITED STATES PATENT OFFICE.

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BAR-TWISTING MACHINE.

1,123,518.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALEXANDER W. GILLESPIE, a citizen of the United States, residing in Chicago Heights, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bar-Twisting Machines, of which the following is a specification.

This invention relates to improvements in bar twisting machines.

An object of the invention is to provide a machine which is adapted to twist bars or rods such as are commonly used in reinforced concrete construction, and to provide such a machine that will operate on either hot or cold bars, of rectangular, square or other polygonal cross section, and which will twist a bar of any desired length uniformly and with a comparatively small loss from friction.

Another object of the invention is to provide a bar twisting machine which has its dies adjustable for operating on bars of different size, and which also has one of its sets of dies provided with mechanism whereby the die may be easily enlarged to thus release the rear end of the bar as it passes through the machine.

Still another object of the invention is to provide a bar twisting machine of the type above indicated which is compact, of simple construction, easily operated and one that occupies a relatively small amount of floor space.

The invention furthermore consists in the improvements in the parts and devices and in the novel combinations of parts and devices herein shown, described or claimed.

In the drawing forming a part of this specification, Figure 1 is a side elevation of a machine embodying my improvements, showing the same in connection with the last set of rolls of a rolling mill. Fig. 2 is an end elevation of the oscillatable die of the twisting machine. Fig. 3 is a longitudinal, vertical section, taken on the line 3—3 of Fig. 2. Fig. 4 is a transverse, vertical section, taken substantially on the line 4—4 of Fig. 1 and Fig. 5 is a detail sectional view, showing the method of mounting one of the rolls forming the die.

In the drawing, A denotes the framework of a machine which is suitably adapted to support the various parts of the mechanism,

and mounted at one end of said framework is a stationary, bodily non-rotatable die designated generally by the reference B. Said die B, as shown, is comprised of a pair of feeding rolls 10, 10, mounted in journal blocks 11, 12, the journal blocks 11 being mounted on threaded rods 13, the latter having mounted thereon between the blocks 11 and 12 coil springs 14, whereby the friction on the bars, as they are fed through the machine, may be varied by means of the tightening nuts 15 on the rods 13. The lower roll 10, as shown in the drawing, is adapted to be rotated as by means of a chain 16, driven from the lower roll 17 of the last set of rolls in the rolling mill. Interposed between the last set of rolls of the rolling mill and the bodily non-rotatable die B is the guiding die 18. From the die B the rods or bars are adapted to be fed to a bodily oscillatable die, designated generally by the reference C. The latter, as shown in the drawing, comprises a hollow, rotatable chuck member 19, rotatably mounted in a sleeve bearing 20 secured to the frame A.

Mounted in the head end 21 of the chuck member 19 is a plurality of rolls 22, each of said rolls being mounted in a forked holder 23, slidably mounted in the head 21, the holders 23 being held in place as by means of the clamping ring 24. Each of the holders 23 is prevented from turning or twisting relatively to the head 21 and is provided with a tongued end 25 adapted to slide back and forth in a correspondingly shaped slanting groove 26 formed in a collar 27, slidable back and forth on the sleeve bearing 20. The collar 27 is provided with a circumferentially extending groove 28 in which take diametrically disposed pins 29 secured to a circular or ring-like lever 30, pivoted at 31 to a part of the bed A, and having a handle 32 whereby as the ring-like lever 30 is swung back and forth about its pivot 31, the sleeve 27 will be moved thereby, thus moving the rolls 22 inwardly and outwardly and thereby varying the size of the die C. Disposed within the hollow chuck member 19 and in the path of the bars or rods as they pass through the machine is a movable projection 33 secured to the lower end of a vertically movable rod 34, mounted in a sleeve 35 secured in the bearing 20, said rod 34 being pivotally connected to a valve

operating lever 36, the latter being normally held down as by means of a spring 37. The rod or bar being twisted after passing through the die C will engage the member 5 33 and thereby lift the valve lever 36 to thereby operate the three-way valve 38 and allow steam or compressed air to enter the cylinder 39 below the piston 40 and lift the latter, said piston 40 having a piston rod 41 on which is formed a rack 42 adapted to en- 10 gage a gear 43 secured on the member 19. After the bar has passed through the machine and the valve lever 36 has returned to normal, the steam or compressed air below 15 the piston 40 will be discharged through the outlet port 44 of the three-way valve 38, and spring 45 secured to the lower end of the rack 42, and the stationary frame A will draw the rack down and consequently return 20 the chuck member 19, carrying the die C, to its original or normal position.

As clearly shown in the drawing, the rolls 22 are skewed relatively to the line of travel of the bar through the machine, and each of 25 said rolls 22 is preferably mounted on anti-friction roller bearings 46 to thereby decrease, as much as possible, the amount of power lost from friction. Each of these rolls 22 forms an active face of the oscillat- 30 able die C, and as shown in the drawing there are four of such rolls for operating on the four faces of a rectangular or square rod, but as will be obvious, the number of these rolls will be varied so as to correspond 35 to the number of faces on the rods or bars being twisted.

In operation, the bar or rod to be twisted is fed from the rolling mill through the feed rolls 10 of the relatively stationary die B, 40 and from the latter into the die C formed by the rolls 22, and as the rod engages the member 33, the die C will be oscillated or rotated a fraction of a rotation, preferably a quadrant, and the bar thereby twisted as 45 the same is fed by the rolls 10, 10. After the rear end of the rod or bar has passed beyond the feed rolls 10, the operator moves the lever 32 so as to enlarge the die C and thus release the rod or bar so that the same 50 may be easily removed from the machine. This last described feature forms an important part of the invention, since hitherto it has been generally necessary, in bar twisting machines, to either knock or hammer the 55 bar from the last die through which it passes in the twisting machine, or else provide means for positively pulling the rod out, both of which methods are undesirable, since they tend to deform and injure the 60 twisted bar or rod.

Various changes and modifications may be made in the construction of the various parts of the machine without departing from the spirit of the invention, and all such 65 changes and modifications are contemplated

as fall within the scope of the claims appended hereto.

What is claimed is:—

1. In a twisting machine for bars of a polygonal cross section, the combination of a 70 bodily non-rotatable die, a bodily oscillatable die including a plurality of rolls forming the active die faces, the number of said rolls corresponding to the number of 75 faces on the bar being twisted, said rolls being normally in position to engage appropriate faces of an entering bar, the die carrying said rolls being subsequently oscillated to a position skewed relatively to the line of travel of the bar as it passes through 80 the machine and means automatically operable upon the passage of said bar through said oscillatable die to move said die to skewed position and to retain said die in said position until the bar has passed there- 85 through, substantially as specified.

2. In a twisting machine for bars of polygonal cross section, the combination of a stationary continuously rotating fitting roll 90 die, a bodily oscillatable twisting roll die, said twisting roll die being provided with rolls adapted to tightly engage and twist a bar passing therethrough from the feeding roll die and being provided with means for 95 readily and easily moving said rolls from said bar to permit release of the rear end of said bar after the bar is twisted, substantially as specified.

3. In a twisting machine for bars of polygonal cross section, the combination of a 100 stationary die having rotatable die rolls, a bodily oscillatable twisting die having rotatable die rolls, the number of rolls in said twisting die corresponding to the number of 105 faces on the bar being twisted, and mechanism for moving the rolls of the oscillatable die toward and from each other to permit adjustment of the die and to permit also movement of said rolls to release the rear 110 end of a bar after being twisted, substantially as specified.

4. In a machine for twisting bars of polygonal cross section, in combination: a non-rotatable feeding-roll die; a bodily oscillatable roll-die, the same comprising a plu- 115 rality of rolls, the number of rolls equaling the number of faces on the bar being twisted, said rolls being skewed relatively to the line of travel of the bar as it passes through the die; means, automatically operable upon 120 the passage of a bar through said oscillatable die, for imparting a partial rotation thereto; and means for varying the size of the oscillatable die, substantially as specified. 125

5. In a bar twisting machine, in combination: a relatively stationary die; a bodily oscillatable roll-die, the latter comprising a hollow, tubular member, and a plurality of rolls movably mounted on said member; a 130

movable collar for moving said rolls toward and from each other; and means, automatically operable upon the passage of a bar through the oscillatable die, for imparting a partial rotation thereto, said means including a member disposed within said tubular member and in the path of a bar as the same passes through the machine, substantially as specified.

6. In a bar twisting machine of the character described, in combination: a relatively stationary die; an oscillatable die in alignment with the stationary die, said oscillatable die comprising a head having a plurality of rolls mounted on radially arranged carriers, the rolls being skewed relatively to the line of travel of the bar; means engaging the outer ends of said radially arranged members and adapted to move the same inwardly and outwardly simultaneously when said oscillatable die is in any

position whereby the space between said rolls may be varied; and means, automatically operated by the bar passing through the oscillatable die, for imparting a partial rotation thereto, substantially as specified.

7. The combination of bar-forming rolls, and means for twisting bars formed by said rolls, said means comprising a stationary die carrying rolls rotated by said bar-forming rolls, an oscillatable die having rolls for twisting said bar, said rolls being normally positioned to engage the faces of said bar, and means for moving said oscillatable die through a partial revolution and for retaining it in such moved position while a bar passes therethrough.

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