April 27, 1937. P. K. PISARCIK 2,078,409

SPANNER WRENCH

Filed May 18, 1936 2 Sheets-Sheet 1

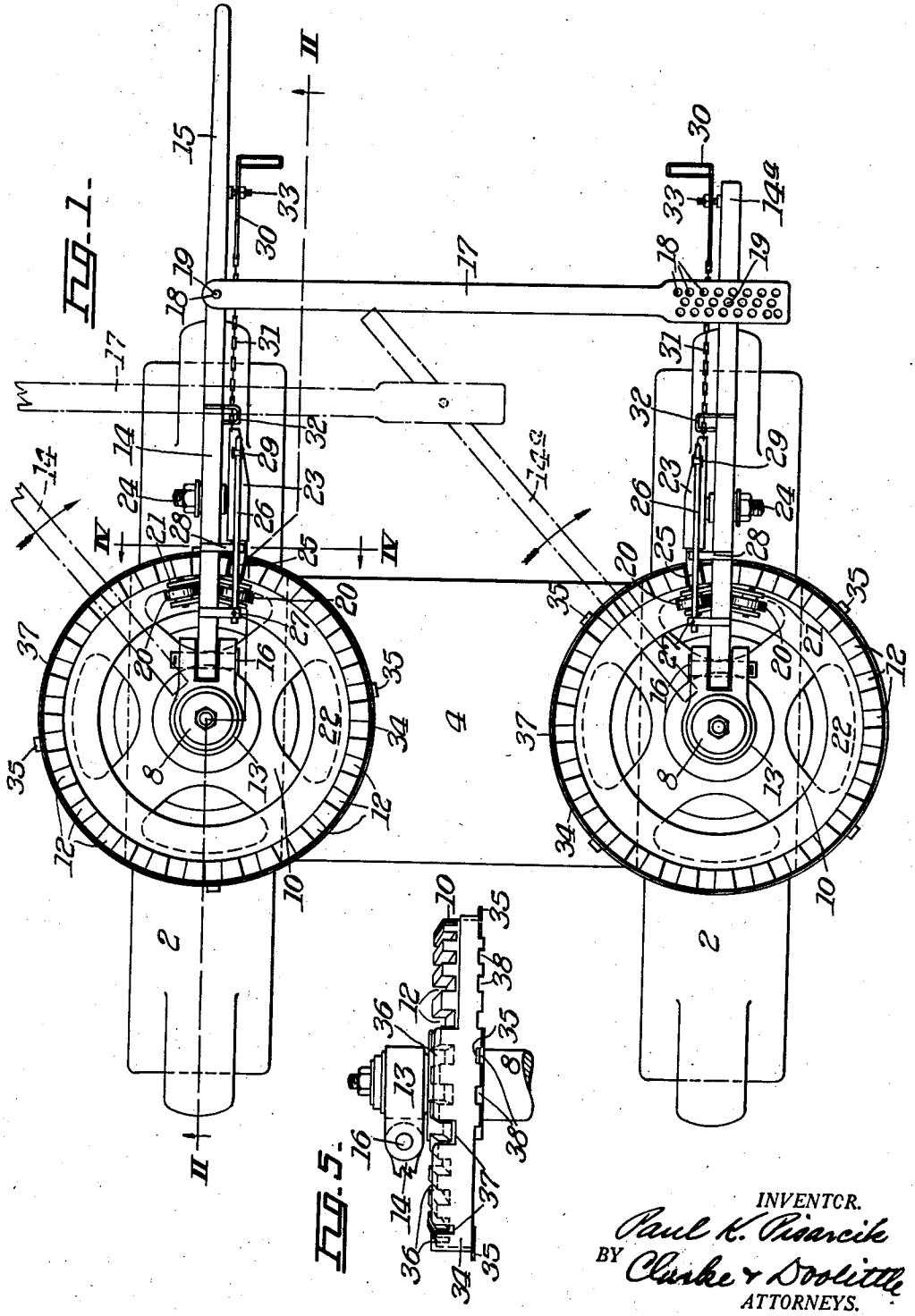


Fig. 1.

Fig. 5.

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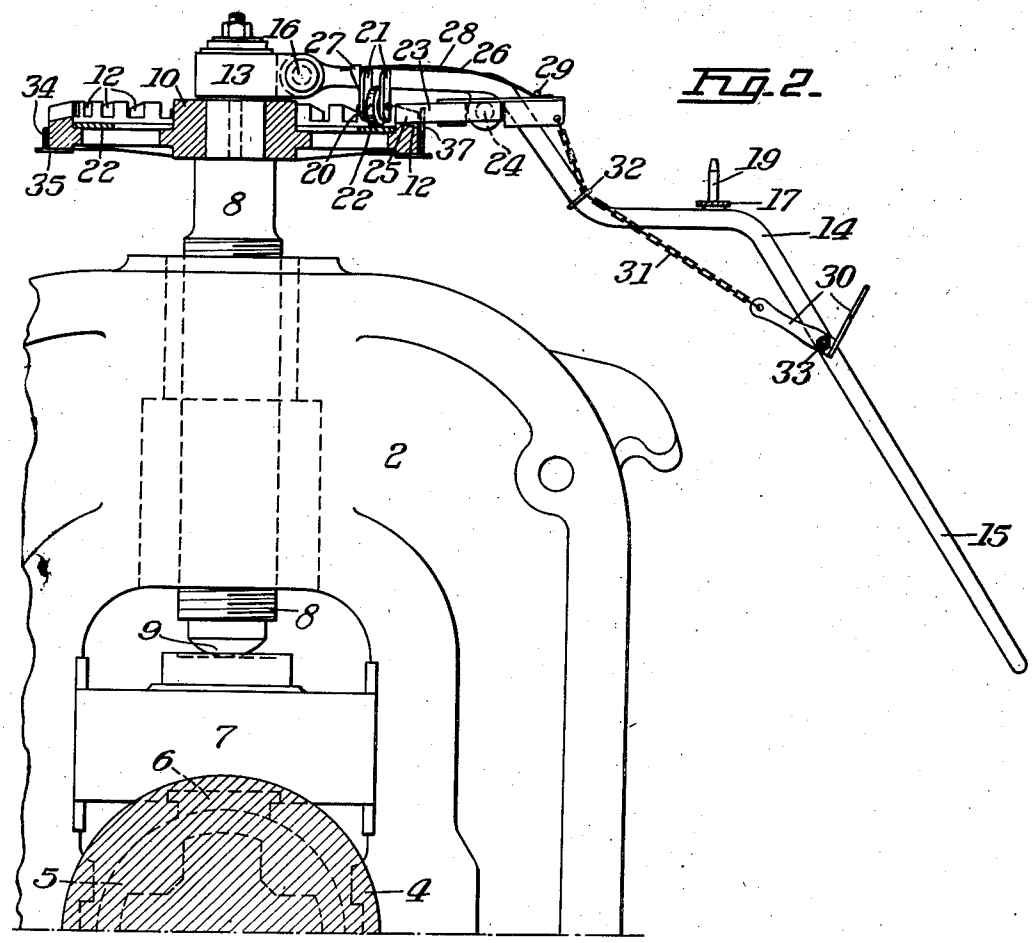


Fig. 2.

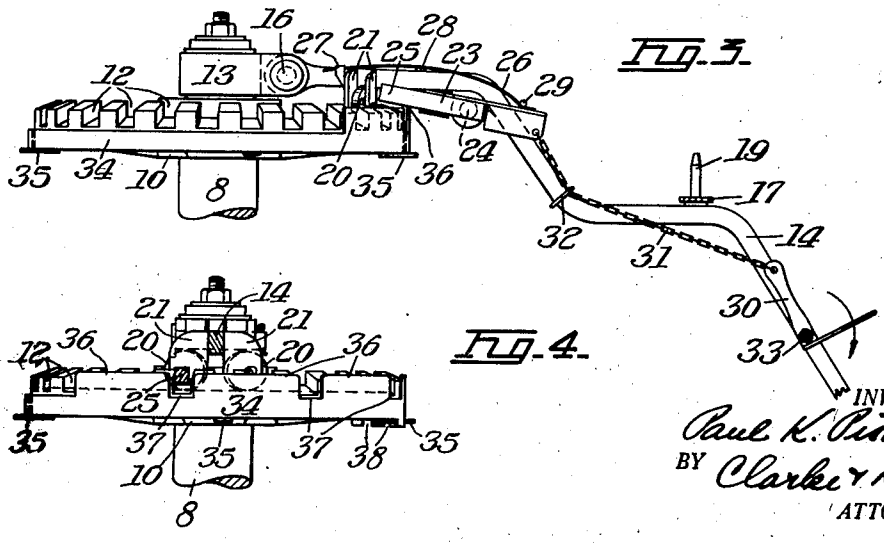


Fig. 3.

Fig. 4.

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2,078,409

SPANNER WRENCH

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15 Claims. (Cl. 80—56)

This invention relates to improvements in spanner wrenches, and more particularly to spanner wrenches of the character employed in the operation of the screw-down adjustment for rolling mills and the like.

The adjustable rolls of rolling mills are commonly provided with screw-downs consisting of movable roll bearings each having a temper screw and an associated notched spanner or crown wheel. Large and heavy spanner wrenches are provided for the temper screws, and are disposed radially over and beyond the wheels for manipulation thereof.

In operating such wrenches, it has been customary heretofore to manually lift the wrench out of engagement with its wheel and reversely rotate the wrench, while supporting its weight, to engage a spaced notch on the wheel, whereby the wheel and its screw may be progressively rotated through an arc of travel corresponding to the desired percentage of draft to be imparted to the rolls.

This manner of operation of the wrench is both onerous and inaccurate, particularly where it is sought to provide equal and simultaneous adjustment to both bearings of an adjustable roll. Even though the two wrenches of a single roll are commonly linked together, it frequently happens that one wrench traverses a different number of notches on its wheel, whereby unequal adjustment is imparted to the roll bearings.

It is a prime object of my invention to provide a self-supporting spanner wrench of the character stated which may be freely operated without the customary tedious lifting and carrying.

A further object is to provide for a positive and accurate indexing of the spanner wheel, whereby the coacting wrench may be successively operated to rotate the temper screw through a desired arc of travel.

It is a still further object to provide an improved construction which readily adapts itself to existing wrenches, whereby the latter may be easily converted into more efficient devices.

Additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawings, wherein:—

Fig. 1 is a top plan view of a rolling mill stand or unit showing the application of my invention thereto;

Fig. 2, a vertical elevational view thereof partly in section, the section being taken on the line II—II of Fig. 1;

Fig. 3, an elevational view of the upper portion of Fig. 2, showing the wrench in released position;

Fig. 4, a cross-section taken on the line IV—IV of Fig. 1; and

Fig. 5, an elevational view of the spanner wheel viewed from a direction opposite to the direction of Fig. 3, particularly showing the manner of adjustably supporting the index ring.

Referring to the drawings, 2 designates a pair of roll housings for mounting a pair of conventional rolls therebetween. The upper or adjustable roll 4 only is shown, it being understood that the roll 4 is designed for adjustment with respect to a lower fixed roll mounted in the same housings. The necks 5 of the roll 4 are confined by upper bearings 6 slidable with the cross-heads 7 of the housings 2.

For tensioning adjustment of the upper roll 4, I have illustrated what are commonly termed in the art as screw-downs, including vertical temper screws 8 threaded in the housings 2, and having lower rounded terminals 9 bearing in provided sockets in the cross-heads 7.

The upper terminals of the screws 8 extend beyond the housings 2 to receive horizontally disposed spanner or crown wheels 10 keyed or otherwise secured to said screws for rotation therewith. The upper face of each spanner wheel 10 is provided with a plurality of peripheral regularly spaced radial slots or notches 12 of predetermined number.

Horizontally swivelled on the upper terminals of the pair of temper screws 8 by means of mounting collars 13, are spanner wrenches 14 and 14*a*, extending radially outward above the spanner wheels 10 and bending downwardly to a position readily accessible to the operator, said wrenches having free movement on the screws independently of the wheels. As shown, one of the wrenches, indicated 14, is longer than the other wrench 14*a*, having a depending handle portion 15.

Under present operation, the wrenches 14 and 14*a* are movable vertically about pivot pins 16 of their mounting collars 13, whereby they may be raised and lowered out of and into engagement with the notches of their spanner wheels 10. For example, practice has determined that in certain mills and rolling operations it is advantageous to rotate the screws through the arc of a certain number of notches, as for example, four notches or spaces 12 on the wheels 10, thereby imparting the proper travel to the screws to impart the desired draft to the rolls.

In order to accomplish this, the operator must

manually lift the heavy wrench, support and rotate the same counter-clockwise four notches on the spanner wheel, and then lower the wrench in its new position into engagement with the wheel for clock-wise rotation of the wheel by the wrench to the initial position of the latter. Although the wrenches 14 and 14a are normally pivotally connected by a link or bar 17, as by means of openings 18 and pins or studs 19, frequently one wrench traverses a slightly different arc than the other, resulting in the application of unequal tension on the bearing necks of the roll 4.

To obviate these difficulties, I have provided a self-supporting and indexing wrench having ease of operation and positive accuracy of adjustment.

Thus, 20 designates supporting wheels or rollers freely rotatable in brackets 21 extending laterally from either side of the wrenches 14 and 14a, and secured thereto in any suitable manner as by welding. The axes of the rollers are radially disposed with respect to the vertical axes of the respective temper screws 8, said rollers being adapted for arcuate travel on flat circular tracks 22 mounted on the upper faces of the spanner wheels inwardly of their annular series of notches 12. The rollers 21 and their mountings are of sufficient size to elevate and support the wrenches above the spanner wheel notches for free rotation about the said wheels and their screws.

For coaction with each spanner wheel in positioning its respective spanner wrench, I provide a spring pawl or latch 23 disposed at one side of the wrench and pivoted thereto by means of a transverse stud 24 for vertical movement. The forward end of the pawl 23 is provided with an angularly disposed terminal 25 extending radially of the spanner wheel 10 and designed to engage the notches 12 thereof. A leaf spring 26 is anchored at its forward end beneath a retaining clip 27 secured to the wrench, and extends over a provided fulcrum 28 for disposition of its free rear terminal slidably between a bearing 29 and the upper surface of the rear end of the pawl, thereby normally urging the forward terminal 25 of the pawl downwardly into contact with a registering notch 12 of the wheel 10.

The rear end of the pawl or latch 23 is connected with a releasing lever 30 by means of a pull or trip chain 31 threaded through an intermediate guide or support 32, said lever 30 having a convenient handle portion and being pivoted to the lower extending portion of the wrench, as indicated at 33.

Spanner wrenches supported and constructed in the manner described may be readily operated by actuation of their pawls 23 through the levers 30, and easily rotated on rollers 20 for manipulation of their spanner wheels without the hardship heretofore encountered. The pawls may be held out of engagement with the wheels through the desired reverse rotation of the wrenches, and released to engage the proper notch for the requisite tensioning rotation of the temper screws 8.

An additional and important feature of my invention resides in the provision of an indexing means for accurately insuring the proper arc of travel of the wrench. Thus, 34 designates an index band or ring disposed in encircling relation about the spanner wheel 8 and secured thereto in any suitable manner, said ring being formed of sheet material and positioned below the lower limits of the notches 12 of said wheel. A plurality of radial lugs or brackets 35 are welded to the under side of the wheel 8 and extend outwardly therebeyond for supporting the ring 34.

As hereinbefore stated, practice has dictated that the temper screws 8 may be lowered in operation a distance corresponding to a certain number of notches on the spanner wheels for each pass through the rolls, as for example, four notches. Hence, I have provided the index rings 34 with a series of elevated sections or cam surfaces 36 having intervening notches 37 in radial register with every fourth notch 12 for a suitable portion of the entire number of notches on said wheels.

As particularly shown in Fig. 3, the cam surfaces 36 are of sufficient height to support the pawls 23 out of engagement with the wheel notches 12. By raising the pawls 23 from their wheels 10 and rotating the wrenches counter-clockwise until the pawls are over a cam surface 36, upon releasing levers 30, the pawls will engage said surfaces and ride thereon until further rotation of the wrenches brings said pawls into register with the next succeeding notches 37 in the index rings 34, whereupon the springs 26 will again enter the pawls into the desired fourth notch of the respective wheels.

The position of the wrenches 14 and 14a when rotated counter-clockwise as stated, is illustrated in dotted lines in Fig. 1, from which position the operator may advance the wrenches clockwise to the starting or full-line position of Fig. 1, for obtaining accurate and proper roll draft. It is to be noted that by the use of the index rings on each of the pair of wrenches 14 and 14a, each wrench will travel through an equal arc, thereby giving equal adjustment to both ends of the roll 4.

For the purpose of properly locating the index rings 34 with respect to the spanner wheel notches 12, I have provided a series of spaced notches 38 on the lower edges of said rings, as particularly shown in Fig. 5. By locating each retaining lug 35 on the wheels 10 in vertical alinement with a notch 12 thereof, and spacing the notches 38 in equal radial spacing with respect to the said notches 12 and the notches 37 of the rings, the rings may be correctly adjusted and positioned for operation by simply engaging one of the notches 38 over one of the supporting lugs 35 as shown. Also, this engagement of the lug 35 and notch 38 prevents relative movement of the index ring and its spanner wheel.

The index rings 34 may be adjusted to proper position with reference to the initial position of the respective wrenches by raising pawls 23, and raising and rotating said rings to engage a notch 38 thereof with a supporting lug 35.

From the foregoing description, it will be seen that my invention may be readily adapted and applied to present spanner wrench constructions as well as in connection with new installations.

While I have shown and described my invention in connection with a particular embodiment, it will be understood that I am not to be limited thereto, as the invention may be employed for other similar uses within the scope of the following claims.

I claim:

1. In a device of the character described, the combination with a vertical screw, of a horizontally disposed spanner wheel secured thereto and having notches therein, a spanner wrench swivelled on the screw above the spanner wheel, a roller carried by and depending from the wrench for supporting said wrench out of engagement with the wheel notches, and means mounted on the wrench for selectively engaging the said notches.

2. In a device of the character described, the combination with a vertical screw, of a horizontally disposed spanner wheel secured thereto and having notches therein, a spanner wrench swivelled on the screw above the wheel notches, a roller mounted on and depending from the wrench and engaging the wheel for rotatably supporting the wrench out of engagement with the wheel notches, and means mounted on the wrench for selectively engaging the said wheel notches.

3. In a device of the character described, the combination with a vertical screw, of a horizontally disposed spanner wheel secured thereto and having notches therein, a spanner wrench swivelled on the screw above the wheel, a roller carried by and depending from the wrench for supporting said wrench out of engagement with the wheel notches, an annular track on the wheel for the roller, a pawl on the wrench for movement into and out of engagement with one of said wheel notches, a spring for normally urging said pawl into such engagement, and means for releasing said pawl therefrom.

4. In a device of the character described, the combination with a rotatable member, of a horizontally disposed spanner wheel rotatable therewith and having an annular series of upwardly open notches therein, a spanner wrench mounted for rotation independently of said wheel, means for supporting said wrench out of engagement with the wheel notches, and a vertically movable pawl on the wrench for selectively engaging the said notches, whereby the wheel may be rotated by means of the wrench.

5. In a device of the character described, the combination with a vertical rotatable member, of a horizontally disposed spanner wheel rotatable therewith and having a series of spaced notches therein, a spanner wrench freely swivelled on said rotatable member above the spanner wheel, a horizontal circular track on the wheel, rollers on the wrench engaging the track for rotatably supporting said wrench out of engagement with the wheel notches, a pawl movably mounted on the wrench, a spring for normally urging said pawl into engagement with one of the wheel notches, and means mounted on the wrench and connecting said pawl for releasing the latter.

6. In a device of the character described, the combination with a spanner wheel having a series of notches therein, of a spanner wrench therefor, means on the wrench for engaging the wheel notches, and an index member for the wheel having a pair of notches and an intervening extended portion permitting and preventing engagement of the wheel notches by means of the wrench.

7. In a device of the character described, the combination with a spanner wheel having a series of notches therein, of a spanner wrench therefor, means on the wrench for engaging the wheel notches, and an adjustable index member for the wheel having a plurality of notches and extended portions for permitting and preventing engagement of the wheel notches by means of the wrench.

8. In a device of the character described, the combination with a spanner wheel having a series of notches therein, of a spanner wrench therefor, means on the wrench for engaging the wheel notches, an index member associated with the wheel notches, said member having a portion thereof coextensive with a predetermined number of said notches, said portion being interposed between the wrench and said notches for preventing engagement with the latter, and means for adjustably positioning the index member in relation to the wheel notches.

9. In a device of the character described, the combination with a spanner wheel having a peripheral series of notches therein, of a spanner wrench therefor having means for engaging the said notches, an index ring disposed about the wheel and having alternate notches and extended portions for permitting and preventing engagement of the wheel notches by means of the wrench.

10. In a device of the character described, the combination with a spanner wheel having a peripheral series of notches therein, of a spanner wrench therefor having means for engaging the said notches, an index ring disposed about the wheel and having alternate notches and extended portions for permitting and preventing engagement of the wheel notches by means of the wrench, and means for positioning the ring on the wheel in relation to the wheel notches.

11. In a device of the character described, the combination with a spanner wheel having a peripheral series of notches therein, of a spanner wrench therefor having means for engaging the said notches, an index ring disposed about the wheel and having alternate notches and extended portions for permitting and preventing engagement of the wheel notches by means of the wrench, and means for adjustably positioning the ring on the wheel in relation to the wheel notches.

12. In a device of the character described, the combination with a spanner wheel having a peripheral series of radial notches therein, of a spanner wrench mounted for rotation about and independently of said wheel, a pawl movably mounted on the wrench for cooperative engagement with the wheel notches, an index ring for the wheel having spaced notches registering with spaced notches on the wheel, said ring having extended portions between its notches for supporting the pawl out of engagement with the wheel notches during rotation of the wrench between successive notches on the said index ring.

13. In a device of the character described, the combination with a spanner wheel having a peripheral series of radial notches therein, of a spanner wrench mounted for rotation about and independently of said wheel, a pawl movably mounted on the wrench for cooperative engagement with the wheel notches, an index ring for the wheel having spaced notches registering with spaced notches on the wheel, said ring having extended portions between its notches for supporting the pawl out of engagement with the wheel notches during rotation of the wrench between successive notches on the said index ring, lugs on the wheel for supporting the ring, said ring having additional notches for engaging one of said lugs for preventing movement of the ring relative to the spanner wheel.

14. In a device of the character described, the combination with a spanner wheel having a peripheral series of radial notches therein, of a spanner wrench mounted for rotation about and independently of said wheel, a pawl movably mounted on the wrench for cooperative engagement with the wheel notches, an index ring for the wheel having spaced notches registering with spaced notches on the wheel, said ring having extended portions between its notches for supporting the pawl out of engagement with the wheel notches during rotation of the wrench between successive notches on the said index ring, lugs on

the wheel for supporting the ring, said ring having additional notches for engaging one of said lugs for preventing movement of the ring relative to the spanner wheel and for adjustably positioning said ring in relation to the wheel notches.

15. In a rolling mill screw-down, the combination with an adjustable roll, of an adjusting screw therefor, a spanner wheel secured to the screw and having a series of notches therein, a spanner wrench therefor having means for engaging the said notches, an index ring disposed about the wheel and having alternate notches and extended portions for permitting and preventing engagement of the wheel by means of the wrench.

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