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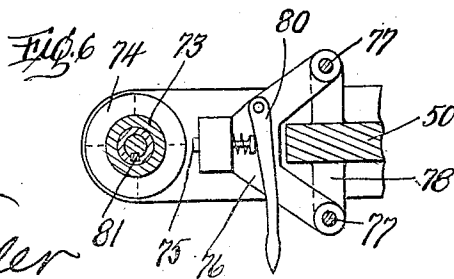
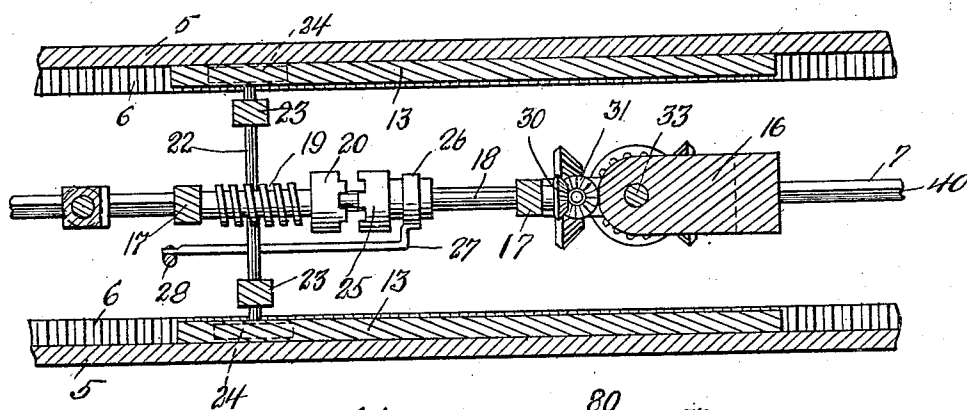
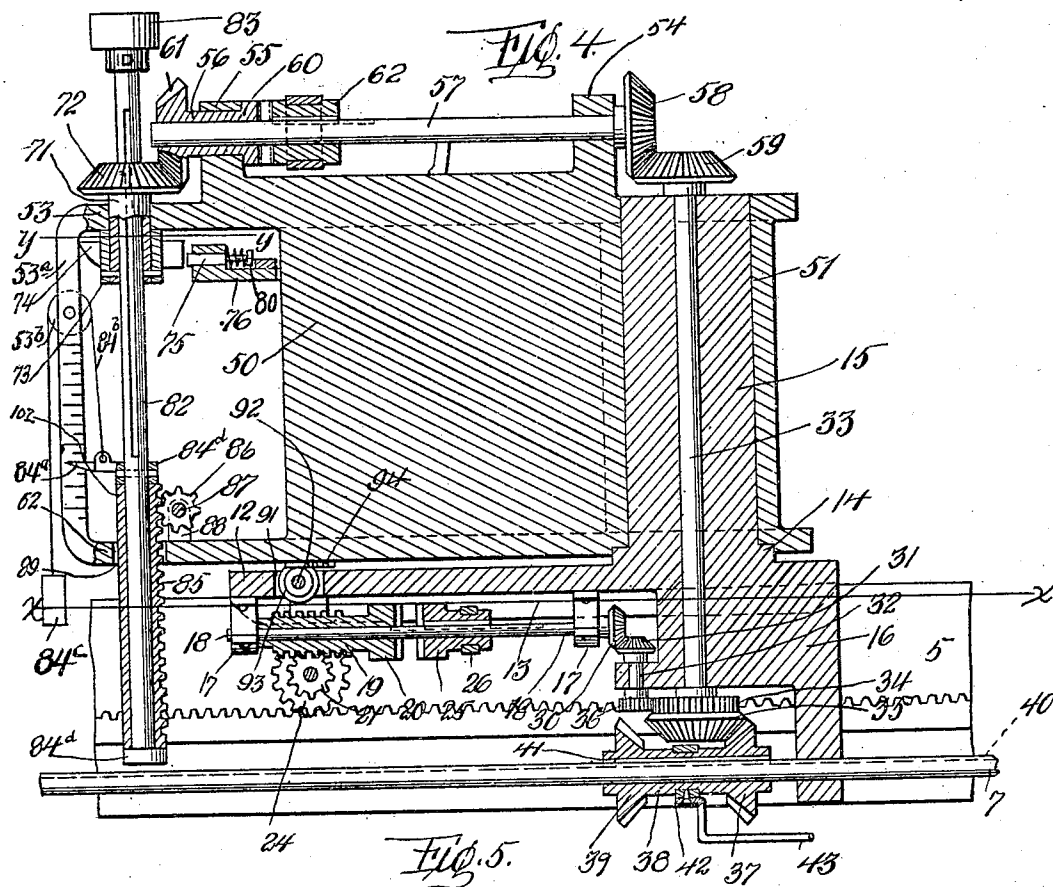
2 SHEETS—SHEET 1.



By  
H. C. Grant & Co.  
Attorneys.

945,680.

2 SHEETS—SHEET 2.



### Witnesses

Witnesses  
 Samuel Payne  
 R. H. Butler

Inventor  
K. S. BEERY,

*M. H. Everett & Co.*  
Attorneys.

# UNITED STATES PATENT OFFICE.

KEMPER S. BEERY, OF PITTSBURG, PENNSYLVANIA.

## NUT-ADJUSTING MACHINE.

945,680.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed August 18, 1908. Serial No. 449,101.

*To all whom it may concern:*

Be it known that I, KEMPER S. BEERY, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Nut-Adjusting Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a nut adjusting machine, and the object of my invention is to provide a novel machine for rapidly screwing nuts upon bolts.

My invention aims to provide a machine that can be advantageously used in the construction of railway car trucks and cars, the machine being designed to travel back and forth beneath the car and adjust the many nuts used in the construction of the car, particularly pressed steel cars. To this end, I have devised a machine comprising a movable carriage which is located in a pit beneath the car track, said carriage being provided with mechanism for imparting a rotary movement to a nut socket, said mechanism being adjustable whereby nuts can be expeditiously secured upon bolts. The power utilized for moving the carriage is also employed for operating the mechanism carried thereby irrespective of the position of the carriage.

My invention embodies certain well known elements that are assembled to provide a durable structure easily controlled and used to an advantage, particularly the saving of labor and the rapid construction of rolling stock.

The detail construction entering into my invention will be presently described, and then specifically pointed out in the appended claims.

Referring to the drawings:—Figure 1 is a side elevation of a machine constructed in accordance with my invention, Fig. 2 is a plan of the same, Fig. 3 is an elevation of an attachment for my machine, Fig. 4 is a longitudinal sectional view of a portion of the machine, Fig. 5 is a horizontal sectional view taken on the line  $x-x$  of Fig. 4, and Fig. 6 is a similar view taken on the line  $y-y$  of Fig. 4.

In the accompanying drawings, 1 designates a pit having a side compartment 2 in which can be located an engine, motor, or suitable source of power for operating my

machine which is located within the pit 1. Above the pit 1 and at the sides thereof I arrange rails 3 for supporting a car over the pit 1, whereby my machine can be used for adjusting any nuts used in the construction of the car.

At each end of the pit is located a standard 4 and arranged between said standards are longitudinal parallel rails 5 having the confronting sides thereof provided with longitudinal racks 6.

In the standards 4 is journaled a longitudinal shaft 7 having one end thereof provided with a beveled gear wheel 8 meshing with a similar wheel 9 mounted upon a drive shaft 10 journaled in a bearing 11, said drive shaft extending into the side compartment 2 of the pit 1.

Slidably mounted upon the longitudinal parallel rails 5 is a carriage 12 having depending side flanges 13 serving functionally as guides, these side flanges 13 engaging the inner confronting sides of the rails 5. The carriage 12 at one end thereof is provided with a circular bearing 14, a post 15 and a depending bearing 16. The carriage 12 is provided with hangers 17 and journaled in said hangers is a longitudinal shaft 18. Loosely mounted upon the shaft 18 is a worm 19 having one end thereof provided with a clutch member 20. This worm is adapted to mesh with a gear wheel 21 mounted upon a shaft 22 journaled in depending bearings 23, carried by the carriage 12. The ends of the shaft 22 are provided with pinions 24 adapted to mesh with the racks 6 and move said carriage longitudinally of the rails 5 when a rotary movement is imparted to the shaft 18.

Upon the shaft 22 is slidably keyed a clutch member 25, said member being adapted to rotate with said shaft, and when placed in engagement with the member 20 imparts a rotary movement to the worm 19. The clutch member 25 is moved through the medium of a band 26, a connecting rod 27 and a pivoted crank shaft 28, said shaft being arranged at the front edge of the carriage 12 and provided with an operating lever 29.

The shaft 18 is provided with a beveled gear wheel 30 meshing with a similar wheel 31 mounted upon a shaft 32, journaled in the depending bearing 16. In this bearing, the bearing 14 and the post 15 is journaled a vertical shaft 33, having the lower end

thereof provided with combined gear wheels 34 and 35, the former meshing with a gear wheel 36 mounted upon the shaft 32, and the latter with a beveled gear wheel 37, carried by one end of the sleeve 38, the opposite end of said sleeve being provided with a beveled gear wheel 39 adapted to mesh with the beveled gear wheel 35 at times. The longitudinal shaft 7 is provided with a longitudinal groove 40 for a spline 41, carried by the sleeve 38, said sleeve rotating with the shaft 7 and being capable of adjustment and imparting a rotary movement to the shaft 33 in the desired direction. The sleeve 38 is provided with a pin 42 connected by a link 43 to a crank shaft 44. This shaft is journaled in bearings 45 at the rear end of the carriage 12 and is connected by a rod 46 to a grip lever 47, said throttle being located at one side of the carriage and provided with a conventional form of rack spring and pawl 48 for holding said grip lever in a fixed position.

Movably mounted upon the circular bearing 14 is a frame 50 having an opening 51 to receive the post 15, extensions 52 and 53 and bearings 54 and 55. In the bearing 55 is journaled a sleeve 56 and journaled in said sleeve and the bearing 54 is a longitudinal shaft 57, the rear end of said shaft having a beveled gear wheel 58 meshing with a beveled gear wheel 59 mounted upon the upper end of the shaft 33. One end of the sleeve 56 is provided with a clutch member 60, while the opposite end thereof is provided with a beveled gear wheel 61.

Slidably mounted upon the shaft 57 is a clutch member 62 adapted to engage the clutch member 60 and impart a rotary movement to the gear wheel 61. The clutch member 62 is provided with a sleeve 63 in which the member 62 rotates having side links 64 connecting with bell-crank arms 65, these arms being pivotally mounted upon the sides of the frame 50, as at 66. Each side of the frame 50 is provided with vertically alining guide brackets 67 and 68 for rods 69, said rods being pivotally connected to the bell crank arms 65. Encircling the rods 69 between the guide brackets 67 and 68 are coil springs 70, said springs having their upper ends fixed to the rods 69 and their lower ends to the lowermost brackets 68. The object of the springs 70 is to pull downwardly upon the rods 69, and through the medium of the bell crank arms 65 and links 64 move the clutch member 62 out of engagement with the clutch member 60 when the clutch member 62 is released, as will hereinafter appear.

In the extension 53 is journaled the sleeve 71 of a beveled gear wheel 72, said beveled gear wheel meshing with the beveled gear wheel 61 of the shaft 57. Fixed upon the lower end of the sleeve 71 is the

hub 73 of a toothed wheel 74, the teeth of said wheel being beveled to escape a spring-held detent 75 loosely mounted upon a bifurcated arm 76 fixed upon vertical rods 77 slidably mounted in brackets 78, carried by the sides of the frame 50. The rods 77 between the bifurcated arm and the lower bracket 78 are encircled by coil springs 79, said springs normally holding the bifurcated arm 76 and the rods 77 in an elevated position, whereby the upper ends of said rods will engage the band 63 of the clutch member 62 and hold said clutch member in engagement with the member 60. Upon the bifurcated arm 76 is pivotally mounted a lever 80 employed for manually moving the detent 75. The teeth of the wheel 74 correspond in number to the sides of the nut, whereby the position of these teeth will indicate the position of the nut socket 83.

Slidably mounted in the sleeve 71 by a spline 81 and adapted to rotate with said sleeve is a vertical shaft 82, the upper end of said shaft supporting a detachable nut socket 83. The lower end of said shaft is provided with a loose graduated sleeve 102, said sleeve being retained upon the shaft 82 by collars 84<sup>a</sup>. One side of the sleeve 83 is provided with a rack 85 meshing with a pinion 86 mounted upon a shaft 87, journaled in brackets 88, carried by the extension 52, this extension having an opening 89 providing clearance for the lower end of the vertical shaft 82 and the sleeve 102 carried thereby. One end of the shaft 87 is provided with a hand wheel 90, whereby the vertical shaft 82 can be vertically adjusted through the medium of the rack 85 and the pinion 86.

The extensions 52 and 53 are connected together by a graduated bracket 53<sup>a</sup> and journaled in said bracket is a pulley 53<sup>b</sup>. The upper collar 84<sup>a</sup> is provided with an indicator 84<sup>a</sup> and connected to this indicator is a cable 84<sup>b</sup>, said cable being arranged over the pulley 53<sup>b</sup> and provided with a weight 84<sup>c</sup>. The graduated bracket 53<sup>a</sup> provides a gage, whereby the operator can readily determine the advance of a nut upon a bolt.

The carriage 12 at the forward end thereof is provided with an opening 91 formed transversely of said carriage, and extending through said opening is a shaft 92 having mounted thereon a gear wheel 93 within the opening 91. This gear wheel is adapted to mesh with a rack 94 arranged upon the bottom of the frame 50, whereby a slight elevation of the shaft 92 will swing the frame 50 upon the circular bearing 14. To facilitate the rotation of the shaft 92 the outer end of said shaft is provided with a hand wheel 95.

In Fig. 3 of the drawings, I have illustrated an attachment that can be used in

connection with my machine by removing the nut socket 83. This attachment comprises a bracket 96 which is loosely mounted upon the upper end of the shaft 82. The bracket 96 has bearings 97 supporting a revoluble shaft 98, which is provided with a detachable nut socket 99 similar to the nut socket 83, and a beveled gear wheel 100. This beveled gear wheel is adapted to mesh with a similar wheel 101 mounted upon the upper end of the vertical shaft 82. The object of this attachment will hereinafter appear, and now the operation of the machine will be described.

Operation: Irrespective of the position of the carriage 12 within the pit, a rotary movement will be imparted to the vertical shaft 33 and the longitudinal shaft 18. Should it be desired to reverse the movement of the carriage 12, it is accomplished through the manipulation of the grip lever 47, which moves the sleeve 38 and places either one of the beveled gear wheels 37 or 39 in engagement with the beveled gear wheel 35, whereby the desired rotary movement will be imparted to the longitudinal shaft 18, and this shaft through the medium of the worm 19 and gear wheel 21 imparts a rotary movement to the pinions 24. By virtue of the clutch members 60 and 62, I am enabled to move the carriage 12 without imparting a rotary movement to the vertical shaft 82. The carriage 12 is preferably positioned before a rotary movement is imparted to the shaft 82, and as this shaft is operated to screw the nut upon a bolt or similar element, said shaft can be elevated by the manipulation of the hand wheel 90, this vertical movement of the shaft being necessary while a nut is being screwed upon a bolt. Assuming that a nut has been screwed upon a bolt by the nut socket 83 fitting upon the nut, the operator of the machine manipulates the lever 80 to throw the detent 75 into the path of travel described by the toothed wheel 74, and the beveled teeth of said wheel engaging the detent 75 forces the bifurcated arm 76 downwardly, moving the rods 77 out of engagement with the band 63 of the clutch member 62. The springs 70 then move the clutch member 62 out of engagement with the clutch member 60 and the beveled gear wheel 61 is free from the rotary movement of the shaft 57. By adjustment of the hand wheel 95, the frame 50 can be swung laterally with respect to the carriage 12, whereby the nuts upon the sides of a car truck can be rotated as easily as nuts located centrally of a truck.

My machine as thus far described is used for adjusting nuts upon vertical bolts, and should a bolt be located parallel to the machine, the attachment shown in Fig. 3 is used. The bracket 96 is swiveled upon the

upper end of the shaft 82, whereby said bracket can be swung in any desired horizontal direction, and irrespective of the position of the bracket 96, a rotary movement will be imparted to the shaft 98 and the nut socket 99 for fastening a nut upon a bolt.

It is obvious that the clutch members 20 and 25 are employed whereby the carriage can remain stationary during the operation of adjusting nuts.

In the construction of my machine, I make the various elements thereof of strong and durable metal, the carriage and frame representing the two castings.

From the novel construction of my machine, it will be observed that I have devised a movable carriage having mechanism for imparting a rotary movement from a longitudinal shaft to a vertical shaft, irrespective of the position of said carriage. While this mechanism is of a preferred form, I would have it understood that the structural elements of the same can be varied or changed as to shape, proportion and manner of assemblage.

Having now described my invention what I claim as new, is:—

1. A nut adjusting machine embodying longitudinal parallel rails, racks arranged upon the confronting sides of said rails, a carriage slidably mounted upon said rails, a frame movably mounted upon said carriage and having extensions, a rotatable vertical shaft journaled in said carriage, means operated by the vertical shaft and engaging the said racks for shifting the carriage, the longitudinal shaft journaled upon said frame and adapted to be driven by said vertical shaft, a second vertical shaft revolubly mounted in said extensions and adapted to be driven by the longitudinal shaft of said frame and provided with a socket, a rack carried by the lower end of said second vertical shaft, means arranged upon one of said extensions and engaging said rack for adjusting said second vertical shaft, an attachment carried by the upper end of the latter, said attachment comprising a swinging bracket, a shaft carried thereby and adapted to be revolved by said second vertical shaft, clutch members arranged upon the longitudinal shaft on said frame, means carried by said frame for normally holding said clutch members in engagement with each other, a toothed wheel arranged at one of said extensions, means supported by said frame and actuated by said toothed wheel for automatically releasing said clutch members, means arranged upon said carriage and engaging said frame for swinging said frame with respect to said carriage, and means arranged upon said drive shaft for reversing the movement of the first mentioned vertical shaft.

2. A nut adjusting machine embodying a

plurality of rails each provided with a rack, supporting means for the rails, a carriage slidably mounted upon said rails, a frame movably mounted upon said carriage and having extensions, a rotatable vertical shaft journaled in said carriage adapted to be driven by said drive shaft, means carried by the carriage and operated by said vertical shaft and engaging in said racks for shifting the carriage, a longitudinal shaft journaled upon said frame and adapted to be driven by said vertical shaft, a second vertical shaft revolubly mounted in said extensions and adapted to be driven by the longitudinal shaft on said frame and provided with a socket, a rack carried by the lower end of said second vertical shaft, means arranged upon one of said extensions and engaging said rack for adjusting said second vertical shaft, clutch members arranged upon the longitudinal shaft of said frame, means carried by said frame for normally holding said clutch members in engagement with each other, a toothed wheel arranged at one of said extensions, means supported by said frame and actuated by said toothed wheel for automatically releasing said clutch members, means arranged upon said carriage and engaging said frame for swinging said frame with respect to said carriage, and means arranged upon said drive shaft for reversing the movement of the first mentioned vertical shaft.

3. A nut adjusting machine embodying a shiftable carriage supporting an operating means therefor, a frame mounted upon said carriage and having extensions, a longitudinal shaft journaled upon said frame and adapted to be driven by said operating means for the carriage, a vertical shaft revolubly mounted in said extensions and adapted to be driven by the longitudinal shaft of said frame, means arranged upon one of said extensions for adjusting said vertical shaft, a nut socket supported by said vertical shaft, clutch members arranged upon the longitudinal shaft of said frame, means carried by said frame for normally holding said clutch members in engagement with each other, a toothed wheel arranged at one of said extensions, means supported by said frame and actuated by said toothed

wheel for automatically releasing said clutch members, and means arranged upon said drive shaft for reversing the movement of the operating means for the carriage.

4. A nut adjusting machine embodying rails, a carriage movable upon said rails, a frame movably mounted upon said carriage and having extensions, a vertical driven shaft journaled in said carriage, a longitudinal shaft journaled upon said frame and adapted to be driven by said vertical shaft, a vertical shaft revolubly mounted in said extensions and adapted to be driven by the longitudinal shaft of said frame, means arranged upon one of said extensions for adjusting said vertical shaft, a nut socket supported by said vertical shaft, clutch members arranged upon the longitudinal shaft of said frame, means carried by said frame for normally holding said clutch members in engagement with each other, a toothed wheel arranged at one of said extensions, means supported by said frame and actuated by said toothed wheel for automatically releasing said clutch members, and means supported by said carriage for reversing the movement of said vertical driven shaft.

5. A nut adjusting machine embodying rails, a carriage movably mounted upon said rails, a frame movably mounted upon said carriage, a vertical driven shaft journaled in said carriage, a longitudinal shaft journaled upon said frame and adapted to be driven by said vertical shaft, a vertical adjustable shaft revolubly mounted in said frame and adapted to be driven by said longitudinal shaft, a nut socket supported by said vertical adjustable shaft, normally closed members arranged upon said longitudinal shaft, a toothed wheel revolved by said vertical adjustable shaft, means supported by said frame and actuated by said toothed wheel for automatically opening said clutch members, and means supported by said carriage for reversing the movement of said vertical driven shaft.

In testimony whereof I affix my signature in the presence of two witnesses.

KEMPER S. BEERY.

Witnesses:

MAX H. SROLOWITZ,  
K. H. BUTLER.