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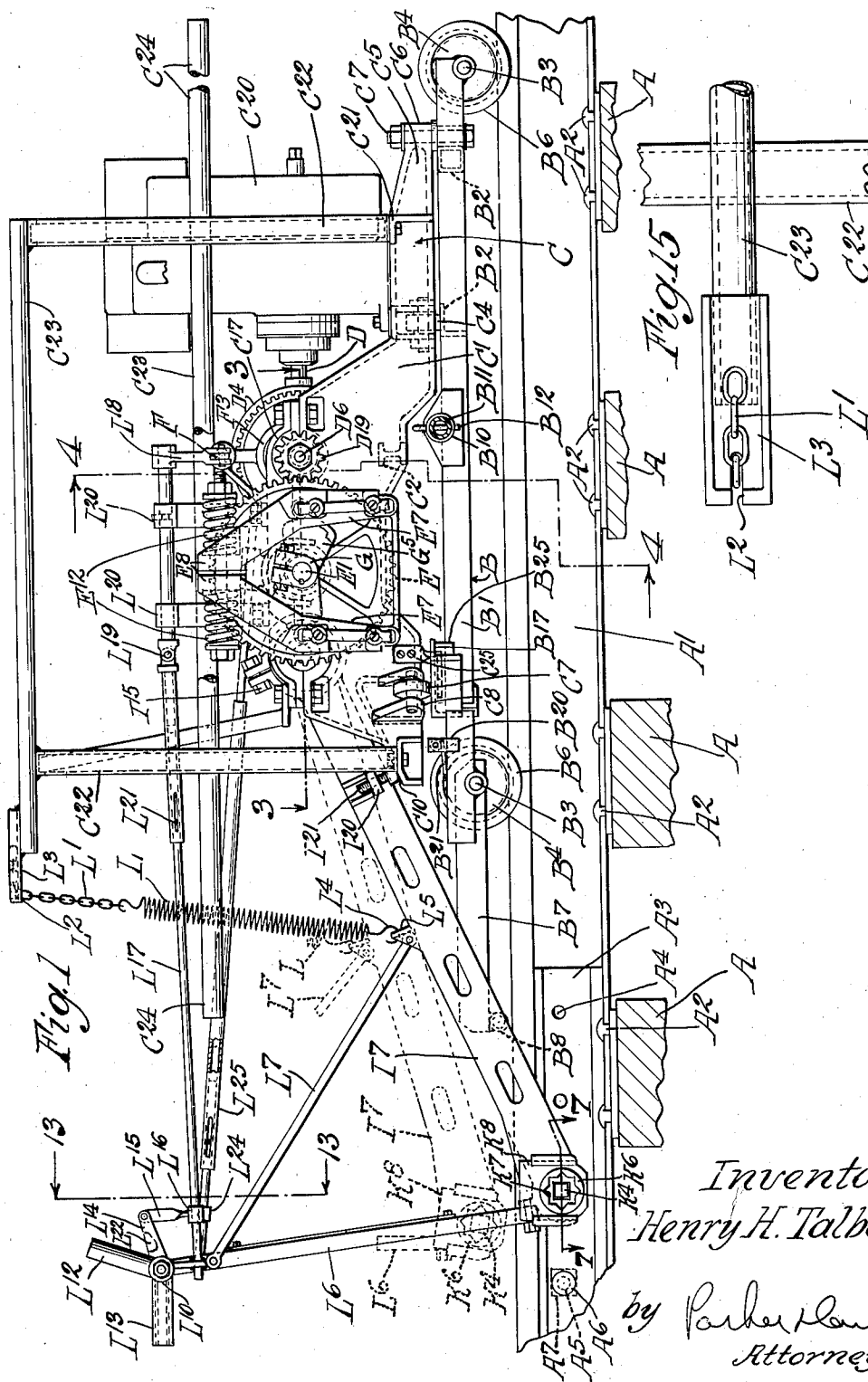
H. H. TALBOYS

1,978,513

TRACK WRENCH

Filed March 20, 1933

6 Sheets-Sheet 1



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Oct. 30, 1934.

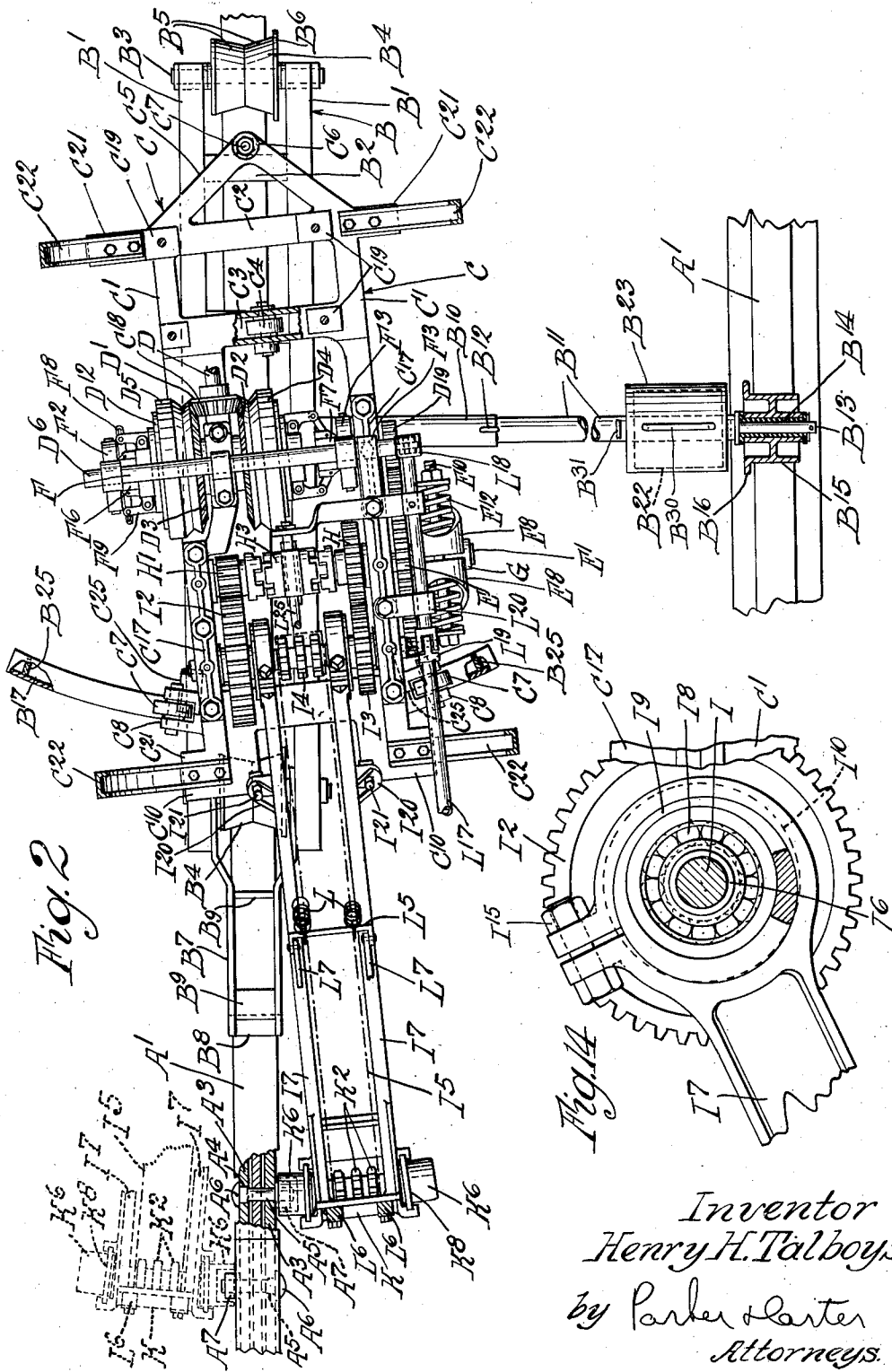
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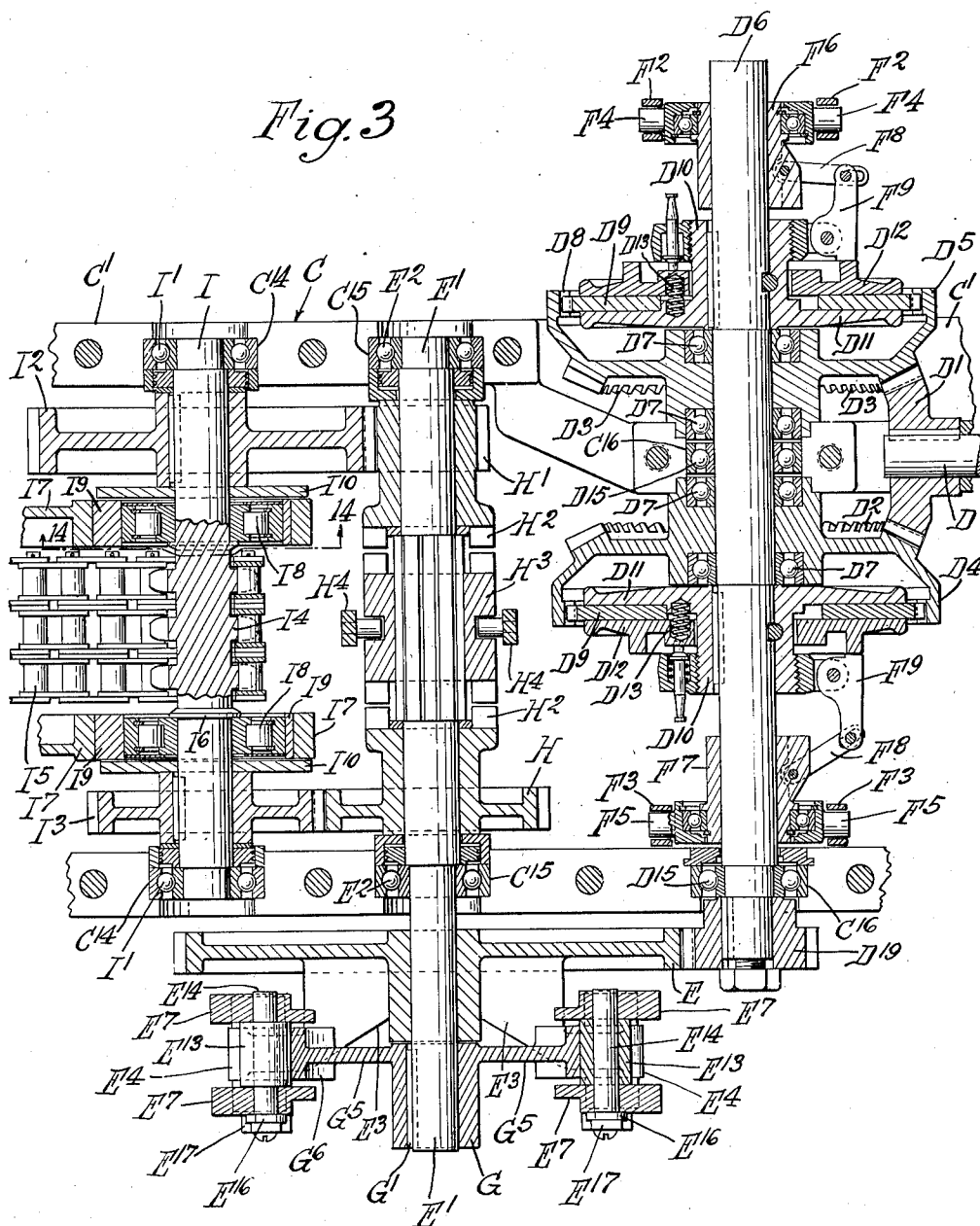
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6 Sheets-Sheet 3



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TRACK WRENCH

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6 Sheets-Sheet 4

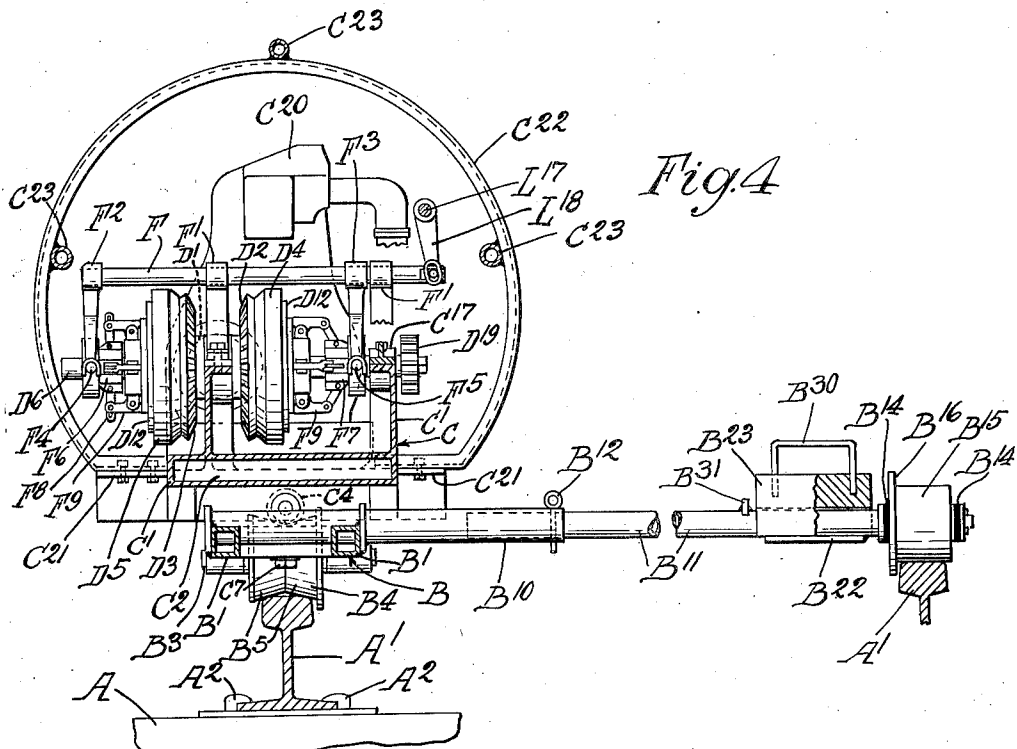


Fig. 4

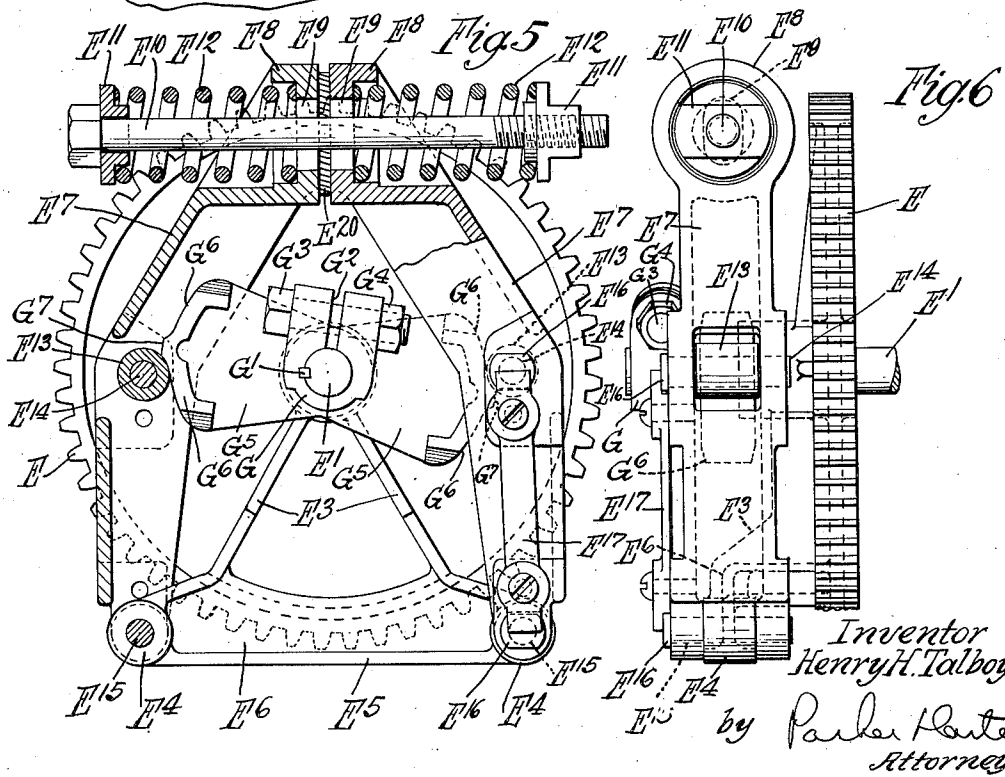


Fig. 5

Fig. 6

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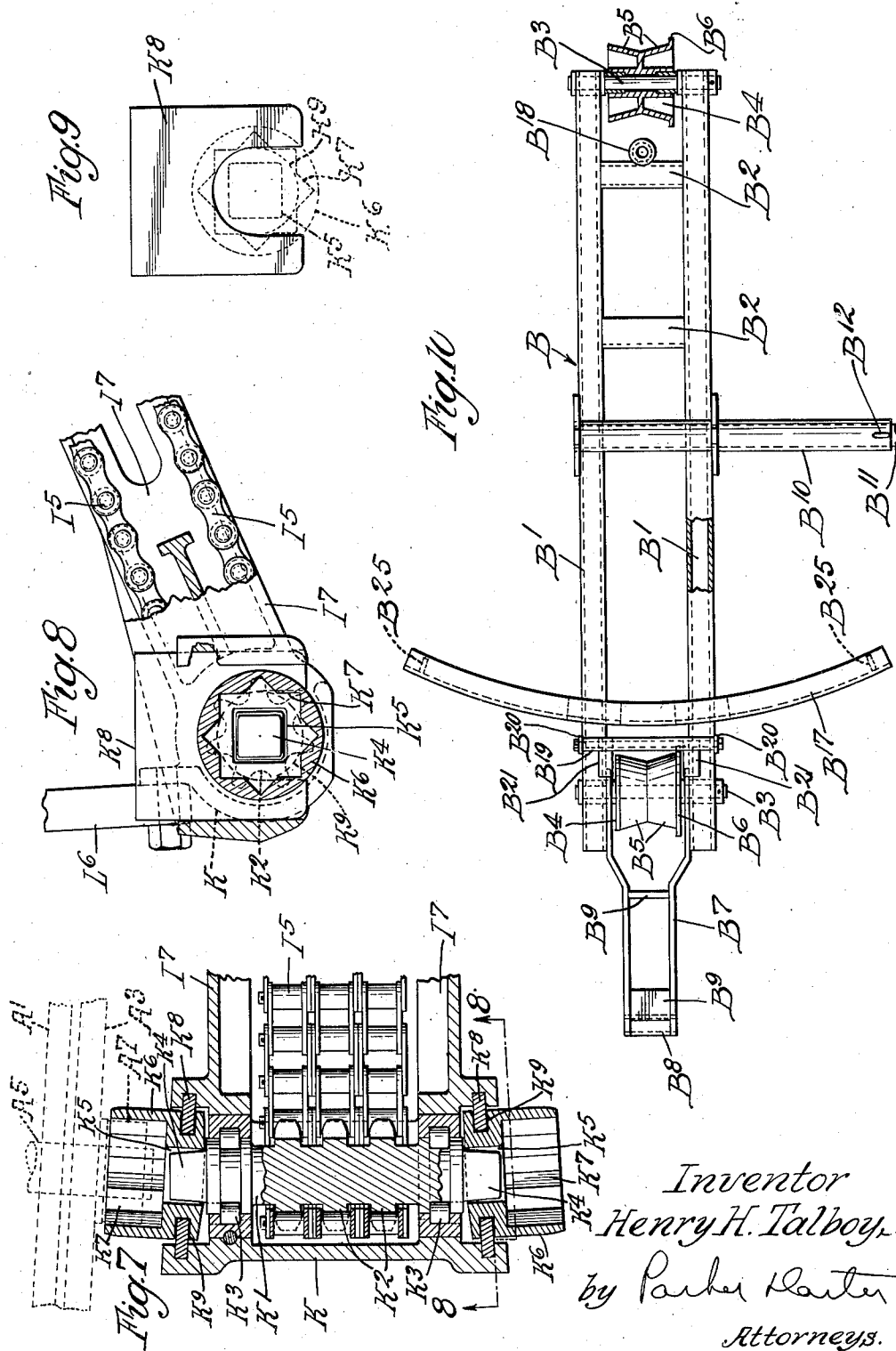
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Filed March 20, 1933

6 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

1,978,513

TRACK WRENCH

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Application March 20, 1933, Serial No. 661,764

16 Claims. (Cl. 81—54)

REISSUED

My invention relates to a power wrench. It is particularly applicable for employment in tightening or removing the nuts and bolts employed in connection with railroad tracks. One object is the provision of such a device which shall be quick and efficient in its operation, simple and easy to handle. Another object is the provision of improved socket means for use in connection with such a device, for grasping nuts or the like. Another object is the provision of means for positioning such socket. Another object is the provision of such a device which may be swung as a whole about a center, in order, for example, to take care of longer or shorter bolts. Another object is the provision of means for ready disassembly. Another object is the provision of means for permitting the device to be rolled off of the track when required. Another object is the provision of an improved speed control mechanism in connection with such a device. Another object is the provision of an improved overload release for such a device. Another object is the provision of an improved roller or wheel for such a device. Another object is the provision of an improved transmission means in connection with such a device and applicable, for example, for use with overload release means. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a side elevation with parts broken away;

Figure 2 is a plan view;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a section on the line 4—4 of Figure 1;

Figure 5 is an elevation of a part of the overload release structure with parts broken away;

Figure 6 is an end elevation of the structure shown in Figure 5;

Figure 7 is an enlarged section on the line 7—7 of Figure 1;

Figure 8 is a section on the line 8—8 of Figure 7;

Figure 9 is a detail of the structure shown in Figures 7 and 8;

Figure 10 is a plan view of the carriage or base frame of the device;

Figure 11 is a plan view of a swinging frame mounted on said base;

Figure 12 is a section on the line 12—12 of Figure 11;

Figure 13 is a section on the line 13—13 of Figure 1;

Figure 14 is a section on the line 14—14 of Figure 3; and

Figure 15 is a detail of a portion shown in Figure 1.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, A indicate any suitable railway ties upon which are mounted rails A¹ which may be secured to the ties as by spikes A². A³ indicate fish plates adapted to connect adjacent rail ends, which plates are apertured as at A⁴ in line with corresponding apertures through the rails, which apertures may receive bolts A⁵ with heads A⁶ and securing nuts A⁷. Referring to Figure 10, B generally indicates a base frame or carriage formed of a plurality of parallel tubular members herein shown as square and indicated as B¹ B¹. They may be connected by transverse braces B². The members B¹ are also connected by bearing pins or pipes B³ upon which rotate rollers B⁴ each of which includes a multiple conic tread B⁵ and a single flange at one edge thereof, B⁶. B⁷ generally indicates a forward extension from one end of the frame which is provided at its end with a sleeve or pipe B⁸, extending downwardly below the level of the lower portion of the frame. B⁹ are any suitable transverse braces for the extension B⁷. B¹⁰ indicates a tube welded across the frame B in which is removably mounted an inner tube of somewhat lesser diameter B¹¹ which may be locked in position therein as by the pin B¹². It carries at its outer end a stub shaft B¹³ shown in Figure 2, surrounded by an insulating sleeve B¹⁴ about which rotates a roller B¹⁵ inwardly flanged as at B¹⁶. B¹⁷ indicates a segmental track element secured to the frame B hereinafter called the outer track. One of the members B² is adapted to serve as an inner track. B¹⁸ indicates a vertical bearing sleeve which may be welded or otherwise secured to the inner of the members B². B¹⁹ is a locking rod rotatably mounted in upwardly extending supports B²⁰ and provided with locking ears or elements B²¹, the purpose of which will later appear. The connection between B¹⁰ and B¹¹ is preferably adjustable so that the effective length of the lateral extension between the tracks may be varied at will.

In Figures 11 and 12 is illustrated an upper carriage generally indicated as C. It includes generally parallel side frame members C¹ connected by a plurality of transverse members C² one of which is hollow as at C³ and carries a roller C⁴ adapted to rest upon one of the mem-

bers B² of the base or frame or lower carriage B. C⁵ is a frame supporting a bearing sleeve C⁶ through which passes a king pin C⁷ shown in Figure 2 which also passes through the bearing sleeve B¹⁸, whereby the upper carriage C is pivoted to the lower carriage or base B. At the opposite end of the frame C from said sleeve C⁶ are additional rollers C⁷ mounted in laterally extending ears C⁸, such rollers being adapted to ride upon the track B¹⁷ of the lower carriage B. The end of the upper carriage is provided with opposed inner faces C⁹ which may serve as lock abutments for the locking members B²¹ when they are swung into locking position in which they are shown in Figure 12. The faces C⁹ form the edges of inclined portions C¹⁰ which join at the transverse bevel or inclined portions C¹¹ associated with downward and generally vertical faces C¹², C¹³, the whole forming an end reinforcement for the upper carriage C. The side frame members C¹ are upwardly extended, as shown in Figure 12 the edges terminating in three bearing half sleeves C¹⁴, C¹⁵ and C¹⁶. At the lower side of the structure as shown in Figure 11 a single upper member may serve to complete all three bearings. I have illustrated, however, in Figure 12, two separate members which complete the upper side of the structure of Figure 11, namely one casting C¹⁷ which completes the bearings C¹⁴ and C¹⁵ and an additional casting C¹⁸ which completes the bearing C¹⁶, which is inwardly offset from the other. C¹⁹ indicate bosses to which any suitable engine structure C²⁰ may be secured. C²¹ indicate lateral extensions or lugs to which may be secured arcuate members or hoops C²² with transverse tubular braces or supporting members C²³ the lower two of which may be extended as at C²⁴ to serve as handles.

Referring for example to Figure 3, D indicates the drive shaft of the engine C²⁰ which terminates in a bevel pinion D¹. It is illustrated as constantly in mesh with two bevel gears D² D³ respectively. Each of these gears forms part of a clutch element having respectively the drums D⁴ D⁵ which rotate freely about the shaft D⁶ upon any suitable roller bearings D⁷ and are in the form of internal gears with teeth as at D⁸ in mesh with toothed gear plates D⁹. Each of these plates is associated with a hub D¹⁰ keyed to the shaft D⁶. Each such hub has associated with it a plate D¹¹ fixed to it and an opposed plate D¹² movable in relation thereto with springs D¹³ tending normally to separate them. It will be understood that the two clutch members are selectively operated one at a time whereby one or the other of gears D² D³ is caused by rotation of the bevel gear D¹ to rotate the shaft D⁶ in opposite directions. The control may be obtained by longitudinal movement of the shaft F as shown for example in Figure 4, which slides in bearings F¹ and which is provided with yokes F² F³ and grasping pins F⁴ F⁵ which control sliding sleeves F⁶ F⁷. Each sleeve is provided with a plurality of links F⁸, operating levers F⁹ which act as cams in thrusting the moving plates D¹² against the fixed plate D¹¹ thereby clamping the clutch plates D⁹ and holding them against rotation. In other words, when the shaft F is moved in one direction one of the clutch plates D⁹ is locked in position, the other being free to rotate between the then loose plates D¹¹ and D¹². When the shaft F is moved in the opposite direction the first clutch plate is released and the opposite clutch plate is clamped. Since the clutch assemblies are both constantly in mesh with the bevel pinion D¹ and are both constantly

rotating the result is a rotation of the shaft D⁶ in one direction or the other. When the shaft F is in the intermediate position there is no rotation of either of the plates D⁹ and therefore no rotation of the shaft D⁶. The shaft D⁶ rotates in any suitable ball bearings D¹⁵ seated in the bearings C¹⁶. To the outer end of the shaft D⁶ is secured the drive pinion D¹⁹.

The drive pinion D¹⁹ is in mesh with a gear E loose on the transverse shaft E¹, which shaft rotates in roller bearings E² in the bearing sleeves C¹⁵.

Associated with the gear E is an overload release shown in greater detail in Figures 5 and 6. The gear E is provided with ribs E³ which extend outwardly and form two bearings E⁴ connected by a reinforcing rib E⁵ the whole tied together by a flange or plate E⁶. Pivoted to the bearings E⁴ are opposite arms E⁷ which approach each other in opposed cylindrical heads E⁸ apertured as at E⁹ through which aperture passes a bolt E¹⁰ having at opposite ends thereof spring abutments E¹¹ one of which may be in the form of a nut for tightening the compression of the springs E¹² compressed between the abutments E¹¹ and the heads E⁸ as shown in Figure 5. It will be clear that these springs tend to move the arms E⁷ inwardly toward each other. E²⁰ indicates a spacing washer interposed between the heads E⁸, the purpose of which will later appear. Each arm is provided with a roller E¹³ rotating about a pin E¹⁴. The arms E⁷ are held in position by pins E¹⁵ passing through the bearings E⁴ and the forked bearings of the arms. The pins E¹⁴ and E¹⁵ all are shown with enlarged heads E¹⁶ which are held in position by locking plates E¹⁷ on the arms E⁷.

G indicates a hub keyed to the end of the shaft E¹ as by the key G¹ but also split as at G² and clamped as by the bolt G³ and nut G⁴. Extending from each side thereof and unitary therewith are webs G⁵ terminating in irregularly rounded cam tracks G⁶ which are adapted to engage the rollers E¹³. Each is provided with a central projection G⁷ which engages the roller and which, in response to predetermined force or resistance, causes the rollers to override them and thereby compresses the springs E¹² and separates the ends of the arms E⁷. It will be clear that under normal driving strains the drive from the engine will be through the pinion D¹⁹, the gear E, the hub G to the shaft E¹. Normally, the gear E and the hub G rotate as a unit, the gear being free to rotate about the shaft E¹, but the hub G being locked for rotation with the shaft E¹. Therefore as long as the gear E and the hub G are connected by the structure shown in Figure 5, they will rotate in unison as if the gear E were also locked to the shaft E¹. Against an overload, however, to prevent killing the engine, and also to give uniform bolt tension, and in case of need, to prevent breakage, rollers E¹³ override the projections G⁷ and in effect the driving connection between the hub G and the gear E is interrupted, thus preventing strain upon the device and breakage. This device is equally effective in either direction since upon reversal of the direction of the drive the members G⁶ simply ride around one-half revolution and engage on the opposite side.

H H¹, in Figure 3, indicate respectively high speed and low speed gears free for rotation in relation to the shaft E¹ but provided with clutch elements or projections H² adapted for engagement with the clutch sleeve H³ which is splined upon

the shaft and which is controlled by any suitable clutch yoke or fork H⁴.

I indicates a shaft mounted in the roller bearings I¹ in the bearing sleeves C¹⁴. Keyed to it is a gear I² in mesh with the gear H¹ and a gear I³ in mesh with the gear H. I⁴ indicates a triple sprocket integral with the shaft I and adapted to drive any suitable flexible drive chain or the like generally indicated as I⁵. Flanges I⁶ guide the ends of wrench arms I⁷ which are provided with a roller bearing connection generally indicated as I⁸ whereby they may be rotated about the shaft I. I⁹ indicates an eccentric effective to vary the length of the arm to take up slack of the chain I⁵. I¹⁵ indicates any suitable securing means such as a bolt and nut whereby the eccentric I⁹ may be adjusted at any desired position. I¹⁰ are bearing plates separating the wrench arms from the adjacent gears. The inner end of the wrench arm or arms is well shown in Figure 3 and the opposite end is well shown in Figures 7 and 8. The side arm sections I⁷ are united as at K in Figures 7 and 8, a member of generally arcuate cross-section. K¹ indicates a sprocket shaft with integral sprocket members K² about which pass the links of the chain I⁵. This sprocket shaft K¹ is mounted in any suitable roller bearings K³ and is provided at each end with squared tapered end members K⁴ which penetrate somewhat loosely a corresponding aperture K⁵ in a socket member generally indicated as K⁶ with its socket aperture K⁷ formed to conform to an eight pointed star, in effect two squares angularly set. In order to hold the socket members in position they are first slipped on the squared ends K⁴ and then the holding plates K⁸ are dropped into position, they being formed to penetrate the circumferential slots K⁹. The plates K⁸ may be held by gravity in position, or any suitable locking means may be employed for locking them in place. The wrench arm I⁷ is provided with laterally extending ears I²⁰ adapted to receive adjustment bolts I²¹ bearing against the inclined faces C¹⁰, as shown in Figure 1. This adjustment will permit lining up the sockets with the bolts of the particular track worked on and prevent upward lifting of either forward roller B⁴, or rear roller B⁴ according to the direction of rotation of the sockets. If this stop adjustment were not used one end of the machine might be lifted from the rail on a hard turn of the socket.

L indicates a spring tending normally to raise the wrench arm I⁷ upwardly away from the work. The upper end of the spring may be secured as to a chain L¹ and effective adjustment means, the chain being adapted readily to penetrate a slot L² shown in Figure 15, in a supporting bracket L³, secured to the end of one of the members C²³. The lower end of the spring L is hooked as at L⁴ into a transverse member L⁵ on the wrench arm I⁷. L⁶ are uprights secured to the end of the wrench arm and connected by braces L⁷ with an intermediate portion of the wrench member as at the transverse member L⁵. The uprights L⁶ carry a sleeve L⁸, shown in Figure 13, in which is mounted a shaft L⁹. Rotatable about opposite ends of the shaft are sleeves L¹⁰ L¹¹ which may be controlled as by the handles L¹² L¹³. The sleeve L¹⁰ is provided with a lever arm L¹⁴ secured to a link L¹⁵ which in turn is loosely secured to a lever L¹⁶ adapted to rotate a longitudinally extending control shaft L¹⁷ upon the opposite end of which is the arm L¹⁸ which controls by a loose connection the endwise movement of the shaft F shown in Figure 4. The shaft L¹⁷, shown in Figure 1, is provided with a universal joint L¹⁹ and is held in bearings L²⁰ and is also provided with any suitable slipping or telescopic connection L²¹ whereby a variation of length is permitted. The sleeve L¹¹ is provided with an arm L²² secured to a link L²³ which in turn is loosely secured to an arm L²⁴ adapted to rotate the shaft L²⁵ the opposite end of which is provided with any suitable yoke or member for imparting endwise movement to the clutch member H³. The yoke is diagrammatically shown as at H⁴ as in Figure 3, it being understood that in response to rotation of the shaft L²⁵ the clutch member H³ will be moved along the shaft H¹. Any suitable bearing means may be provided for the shaft L²⁵ and any suitable telescopic connection. I prefer normally to maintain drive through the high speed gears H and I³. I therefore provide a spring L³⁰ adapted to move the arm L²⁴ in the proper direction to maintain such engagement.

It will be realized that whereas I have described and shown a practical and operative device, nevertheless many changes might be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative and diagrammatic rather than as limiting me to my specific showing.

The use and operation of my invention are as follows:

In working on railroad tracks, one frequently necessary operation in connection with laying new track or taking up or re-laying old, is the tightening and untightening of the bolts passing through rail ends and rail connecting or fish plates. Tightening or untightening these nuts and bolts manually is a tiresome, slow and expensive operation, owing to the number of bolts which must be handled and the size of the gang which is necessary to operate on them with any speed. My wrench permits a single operator to tighten and untighten bolts and nuts at maximum speed and with minimum effort, with the resultant saving in time and in labor costs.

Stated broadly, my device includes a base frame B mounted on longitudinally spaced rollers, which rides upon a rail the center of mass being generally aligned with the rail. This base frame or lower carriage is balanced by the laterally extending member B¹⁰ B¹¹ which carries an insulated roller or wheel B¹⁵ which rests on the opposite rail of the track. The center of mass of the entire device is between the two rails but only slightly within the rail over which the carriage B is positioned, so that the carriage can readily be rolled off of the track. In such case the hoops C²² serve as rollers whereby the carriage may simply be turned upside down by a single operation by a single man, being laterally withdrawn from the track in the course of its tilting movement on the hoops C²². Thus the single operator can readily get the wrench off of the track if a train is coming or if another piece of rail equipment is to pass. The hoops C²² not only permit this tilting movement but serve as a species of protection for the mechanism during the tilting and also serve as ready means for the attachment of the members C²³ the ends of some of which, as at C²⁴, serve as handles for the ready movement of the device along the rails, or in case two or more men wish to lift the device bodily off the track.

Pivoted as at C⁷ to the lower carriage or base member B is the upper carriage or frame generally indicated as C. The two carriages may be held against relative movement by the locking means shown in Figures 11 and 12, including the tilttable members B²¹ which abut against the surfaces C⁹ of the upper carriage. They may be so locked when the device is simply being moved along the tracks and is not in use. When the operator is using the device, however, the locking means are released so that the carriage C may be readily swung around its pivot, as it rides on its supporting rollers. Mounted on the upper carriage is any suitable power source, such as the motor generally indicated as C²⁰ which, through the earlier described transmission, is effective to rotate the wrench sockets K⁶. These sockets are at the end of the wrench arm I⁷. In use the operator swings the upper carriage C laterally in order to position the wrench arm on one side or the other of the rail he is working on. He may then thrust down manually against the spring L until he moves the wrench arm into the position in which it is shown in full line in Figure 1, at the proper level to engage the bolt ends or nuts upon which the operator is working. A lateral movement is then sufficient to move the socket member into nut engaging position. The clutch may then be actuated as by a rotation of the sleeve L¹¹ and the handle L¹³ and the desired speed may be governed by rotation of the sleeve L¹⁰ by means of the handle L¹². In any case, the socket member is rotated and the nut screwed on or off, as the case may be. Since the operator is finished working on a given nut he may release his normal downward pressure on the members L¹⁰ L¹¹ or on the member L⁸, and the spring L is then effective to draw the wrench arm up into the inoperative position to clear the rail, shown in dotted line in Figure 1. The effective tension of the spring may be varied by varying the position of the chain L¹ in the slot L², as is clear from Figures 1 and 15.

In practice, I find it valuable to provide an overload release and I employ the structure shown in Figure 1 and in considerable detail in Figures 5 and 6, and overload release which is equally effective in either direction of rotation or drive. It is in effect an adjustable disengaging means or connection between the gear E and the shaft E¹, being either positively in or out of engagement, like the action of a jaw clutch, the gear E being loose on the shaft E¹ but being connected thereto through the keyed hub G and the earlier described tripping connection. When there is such resistance to rotation that the rollers E¹³ override the projections G⁷, the effective driving connection is broken. The springs E¹², however, normally hold the parts in the position in which they are shown in Figure 5, providing a constant driving connection. When there is a change in the direction of rotation, the members G⁵ simply rotate through something less than 180 degrees and are urged in reverse direction against the rollers E¹³. As shown in Figure 5, I illustrate a washer or filler piece E²⁰ which is positioned between the two heads E⁸ and which has the important function of securing a uniform overload release of the mechanism. It is effective to hold the arms E⁷ so far apart that the rollers below described as E³ will not quite touch the cam tracks G⁶. If one of these rollers is permitted to touch the surface of the cam track G⁶ the mechanism may turn before the rollers E¹³ contact the central projection D⁷. The in-

terval between the two may be very slight and is therefore not indicated in the figure. This washer E²⁰ may if desired be made of rubber, fiber or other soft material, thereby lessening the shock on the mechanism when the springs E¹² snap the arms E⁷ together after they have been spread by overriding the projection G⁷.

In order to prevent any accidental unintended tilting of the device I may employ a removable counterweight B²³, which may be loosely positioned about the shaft B¹¹ upon a supporting plate B²² and which may be quickly removed by the handle B³⁰ to reduce weight when lifting the machine. If preferred, the counterweight may be welded or fixed in place. B³¹ indicates a lug welded to the member B¹¹, the object of which is to prevent the weight B²³ from sliding laterally on the arm B¹¹, when it is movably positioned thereon.

This machine is designed primarily as a maintenance tool. It will reach a nut on almost any track bolt on a rail, at forks and switch points. The machine pivots from the extreme rear end, about the bolt C⁷, and the wrench sockets K⁶ are set at a slight angle so that they go over the nut parallel to the axis of the bolt. I have illustrated the machine as having two speeds, depending upon whether the drive is through the gears H or H¹. Change from high to low speed or vice versa instantaneously is possible, or the device may be left in neutral, with the motor running.

The overload release may be set to unload at any desired torque and will so unload continuously without any change in the torque, due to the fact that the unloading or release is governed by a spring and not by friction. Therefore, the foreman can set the machine so that it will operate all day long, pulling up every bolt to the same degree of tightness, which tests show have but slight variation which may be due to the extra friction of some nuts over others. In tightening nuts, for example, the foreman may set the device at the desired nut tightness and that is as tight as the nut can be set, because the setting of the spring causes a release when the desired tightness of the nut is reached. Thereby, the operators cannot over-tighten a nut, or twist off a bolt, when operated at high speed.

In maintenance work, if the socket member K⁶ is put over a nut and the nut does not turn without unloading the machine, the operator does not know whether the nut is tight enough or whether it is frozen to the bolt. A quick turn of the wrist to employ the control thrusts the machine in reverse at low speed. This cracks the nut loose, and the machine may again be reversed, at high speed, and the unloading device then governs the tightening of the nut in the usual way, leaving it at a predetermined tightness or tension.

The machine is available for de-nutting or running up nuts with a rail laying gang. On de-nutting a start on low cracks the nut loose and the machine is then quickly turned into high, to run the nut off. On running the nuts up, in rail laying work, it is only necessary to do this in high, where the machine unloads at the proper point, because of the overload setting of the springs E¹².

The torque of the machine in low gear is sufficient to twist off any frozen nut on old rusted bolts, or even break the stem of such bolts. When running in reverse, to loosen a nut from a bolt, the automatic release shown in Fig-

ure 5 is out of action for the half turn following the change of direction and permits the roller to come in contact with the projection G⁷ with a hammer blow. This subjects a frozen nut to the same effect as though a wrench were used and it were struck with a hammer. The shocks or blows tend to loosen up the frozen parts more effectively, and the momentary shock of the roller hitting the projection G⁷, because of the inertia of the arms E⁷ will momentarily produce a greater torque than would be occasioned by the relatively stationary position of the roller and projection G⁷.

When direction of rotation is reversed my machine automatically loosens the chuck or socket K⁷ from the nut, due to the reaction or snap from the overload release, coupled with a certain amount of spring continuing in the train of power of the gears and sprocket chain. In other words, a certain lost motion in the parts is of great advantage in automatically releasing the socket with a positive snap action on the nut. Furthermore, when the friction clutch or connection is released, the entire mechanism between the socket K⁷ and the clutch is released, by virtue of the fact that there is no worm gear used in the train and that thereafter the lost motion and spring in the connecting parts are of advantage in backing up or rotating the mechanism in the direction opposite to its direction prior to the release of the clutch.

On maintenance work in practice I have found it easy to tighten two joints per minute, including the moves. In rail laying, I have found that one 4-bolt joint can easily be tightened every 50 seconds including the moving of the machine from joint to joint.

The machine is very easily moved, partly due to its light weight, and particularly to the fact that it is mounted on double cone shaped rollers which keep the wheels centered on the rail and eliminate flange friction. The ball bearing mounting for the rollers may be employed. As the rollers are only single flanged, they will ride through switches and frogs without trouble.

In order to prevent excess lateral movement of the upper carriage C, I have provided limit stops B²⁵ welded beneath the roller engaging flange of the segmental track B¹⁷ which may be engaged by the angular brackets C²⁵ secured to either side of the upper carriage C as illustrated in Figures 1, 2, 11 and 12. Note that one end of the angular bracket C²⁵ extends beneath the roller engaging flange of the track B¹⁷ of the lower carriage B preferably with sufficient clearance so as not to contact said flange. Another function of the brackets is to lift the frame B when the machine is lifted by handles C²⁴. Another function of the brackets C²⁵ is to support the forward portion of the upper carriage if the power wrench is tilted or rolled off upon the hoops C²² giving in effect a three-point suspension by means of the two brackets C²⁵ and the king pin or bolt C⁷.

I claim:

1. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track, and a power wrench mounted thereon, including an arm mounted for lateral oscillation in relation to said base frame, about a generally vertical axis aligned vertically with the rail on which the base frame rides, said arm being also oscillatable about a horizontal axis, and a wrench element on said arm rotatable about

a generally horizontal axis, and means for rotating it.

2. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track, and a power wrench mounted thereon, including an arm mounted for lateral oscillation in relation to said base frame, about a generally vertical axis aligned vertically with the rail on which the base frame rides, said arm being also oscillatable about a horizontal axis, and a pair of wrench elements on said arm, rotatable about a generally horizontal axis, and means for rotating them, the wrench elements being oppositely and outwardly faced on opposite sides of the lower end of said arm.

3. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track, and a power wrench mounted thereon, including an arm mounted for lateral oscillation in relation to said base frame, about a generally vertical axis aligned vertically with the rail on which the base frame rides, said arm being also oscillatable about a horizontal axis, and a pair of wrench elements on said arm, rotatable about a generally horizontal axis, and means for rotating them, the wrench elements being oppositely and outwardly faced on opposite sides of the lower end of said arm, the axis of rotation of said wrench elements being slightly inclined in relation to each other.

4. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track, and a power wrench mounted thereon, including an arm mounted for lateral oscillation in relation to said base frame, about a generally vertical axis aligned vertically with the rail on which the base frame rides, said arm being also oscillatable about a horizontal axis, and a pair of wrench elements on said arm, rotatable about a generally horizontal axis, and means for rotating them, the wrench elements being oppositely and outwardly faced on opposite sides of the lower end of said arm, the axis of rotation of said wrench elements being slightly inclined in relation to each other, the wrench carrying end of said arm extending longitudinally substantially beyond the end of the base frame.

5. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track, and a sub-frame mounted upon said base frame for lateral oscillation about a generally vertical axis aligned vertically with the rail on which the base frame rides, and a power wrench mounted thereupon, including an arm mounted for vertical oscillation in relation to said sub-frame, about a generally horizontal axis, and a wrench element on said arm, rotatable about a generally horizontal axis, and means for rotating it.

6. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track, and a sub-frame mounted upon said base frame for lateral oscillation about a generally vertical axis aligned vertically with the rail on which the base frame rides, and a power wrench mounted thereupon, including an arm mounted for vertical oscillation in relation to said sub-frame, about a generally horizontal axis, and a pair of wrench elements on said arm, rotatable about a generally horizontal axis, and

means for rotating them, the wrench elements being oppositely and outwardly faced on opposite sides of the lower end of said arm.

7. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a sub-frame mounted upon said main frame for lateral and generally horizontal oscillation in relation thereto about a vertical axis generally vertically aligned with the rail, a wrench support mounted on said sub-frame for oscillation about a generally horizontal axis, a wrench rotatably mounted adjacent the outer end of said support, the axis of rotation of said wrench being generally horizontal, and means for rotating said wrench selectively in a plurality of directions of rotation.

8. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a sub-frame mounted upon said main frame for lateral and generally horizontal oscillation in relation thereto about a vertical axis generally vertically aligned with the rail, a wrench support mounted on said sub-frame for oscillation about a generally horizontal axis, a wrench rotatably mounted adjacent the outer end of said support, the axis of rotation of said wrench being generally horizontal, a motor supported by said main frame, and a drive extending from said motor to said wrench.

9. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a sub-frame mounted upon said main frame for lateral and generally horizontal oscillation in relation thereto about a vertical axis generally vertically aligned with the rail, a wrench support mounted on said sub-frame for vertical movement in relation to said sub-frame and the rail upon which the sub-frame is mounted, said wrench support extending substantially beyond the end of the frame, and a pair of wrench elements rotatably mounted upon said support, one at each side thereof, the wrench elements being oppositely faced, the wrench support being movable, at each side of the rail, to a level effective to align the wrench elements with the nuts to be operated upon.

10. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a sub-frame mounted upon said main frame for lateral and generally horizontal oscillation in relation thereto about a vertical axis generally vertically aligned with the rail, a wrench support mounted on said sub-frame for vertical movement in relation to said sub-frame and the rail upon which the sub-frame is mounted, said wrench support extending substantially beyond the end of the frame, and a pair of wrench elements rotatably mounted upon said support, one at each side thereof, the wrench elements being oppositely faced, the wrench support being movable, at each side of the rail, to a level effective to align the wrench elements with the nuts to be operated upon, and means tending normally to hold said wrench support at a level above the top of the rail.

11. A device for tightening and removing hori-

zontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a sub-frame mounted upon said main frame for lateral and generally horizontal oscillation in relation thereto about a vertical axis generally vertically aligned with the rail, a wrench support mounted on said sub-frame for vertical movement in relation to said sub-frame and the rail upon which the sub-frame is mounted; said wrench support extending substantially beyond the end of the frame, and a pair of wrench elements rotatably mounted upon said support, one at each side thereof, the wrench elements being oppositely faced, the wrench support being movable, at each side of the rail, to a level effective to align the wrench elements with the nuts to be operated upon, and means tending normally to hold said wrench support at a level above the top of the rail including a coil spring and a connection between said coil spring and the sub-frame.

12. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a sub-frame mounted upon said main frame for lateral and generally horizontal oscillation in relation thereto about a vertical axis generally vertically aligned with the rail, a wrench support mounted on said sub-frame for vertical movement in relation to said sub-frame and the rail upon which the sub-frame is mounted, said wrench support extending substantially beyond the end of the frame, and a pair of wrench elements rotatably mounted upon said support, one at each side thereof, the wrench elements being oppositely faced, the wrench support being movable, at each side of the rail, to a level effective to align the wrench elements with the nuts to be operated upon, and means tending normally to hold said wrench support at a level above the top of the rail, and means for manually thrusting the wrench support effective to align the wrench elements with the nuts to be operated upon.

13. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a wrench support supported upon said base frame and mounted for oscillation about a generally horizontal axis, a wrench rotatably mounted adjacent the outer end of said wrench support, said wrench including a shaft and means for rotating it, a squared extension upon said shaft, a wrench socket including an aperture conforming generally to said squared extension, said socket element being rotatably mounted upon said support, and means for maintaining the axis of rotation of said socket member slightly inclined relative to the axis of rotation of said shaft.

14. A device for tightening and removing horizontally axised nuts or bolts from rails, which includes a base frame movably mounted upon a rail of a track and extending substantially above the level of the top of said rail, a wrench support supported upon said base frame and mounted for oscillation about a generally horizontal axis, a wrench rotatably mounted adjacent the outer end of said wrench support, said wrench including a shaft and means for rotating it, a squared extension upon said shaft, a wrench sock-

et including an aperture conforming generally to said squared extension, means for rotatably supporting said wrench socket upon the wrench support with the aperture of the wrench socket in loose engagement with said squared extension and means for maintaining the axis of rotation of the wrench socket inclined with respect to the axis of rotation of said shaft.

15 15. In a wrench mechanism, a socket support, a shaft on said support and means for rotating it, said shaft including a squared extension, a socket element including an aperture conforming generally to said squared extension and means for rotatably positioning said socket element on

the support with said aperture penetrated by said squared extension, including a slide removably mounted on said support, said slide including edges interpenetrating with said socket member.

16. In a wrench mechanism, a base movable along the rail of a track, a socket support mounted upon said base, a socket upon said socket support, a power source mounted on said base, a drive between said power source and socket, and means for reversing the direction of said drive, and means for imparting to said socket, after said reversal of direction, a sudden twisting movement.

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