Sept. 9, 1924.

1,508,012

F. DANIELSON

AXLE STAND

Filed June 24, 1920

3 Sheets-Sheet 1

Fig. 1

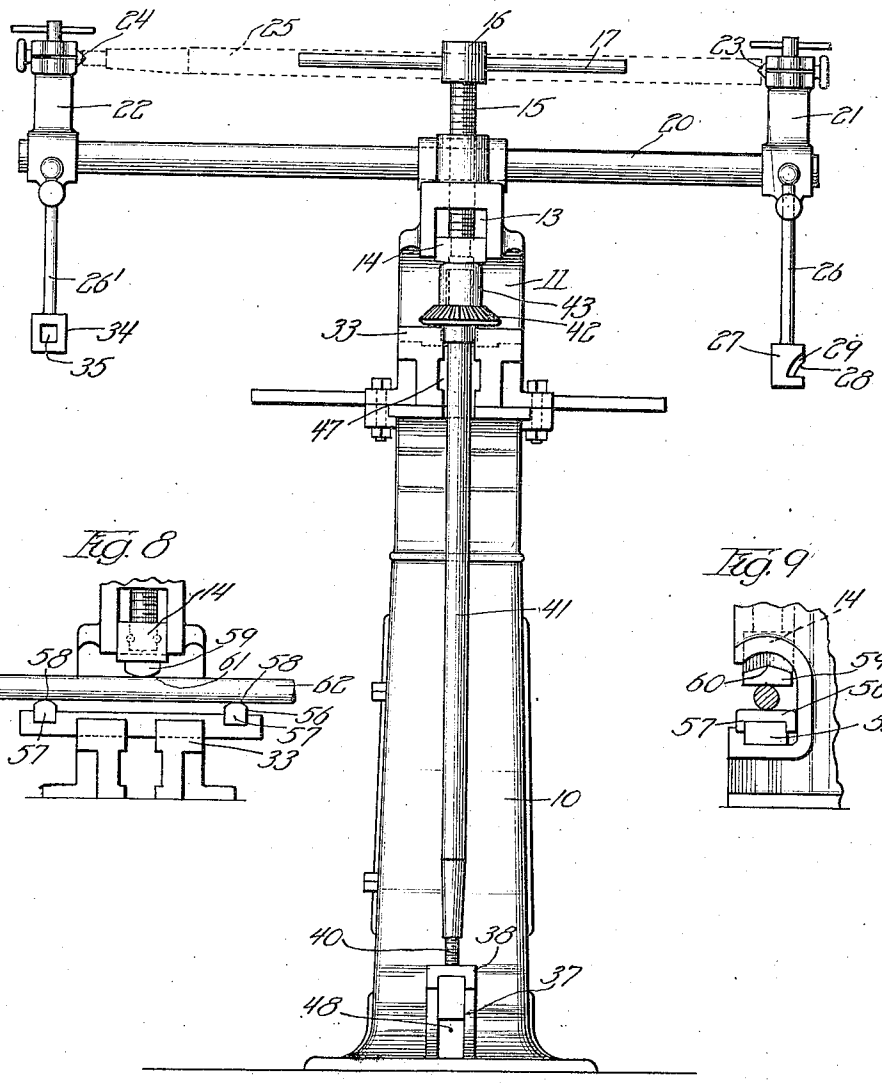


Fig. 8

Fig. 9

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Fig. 3

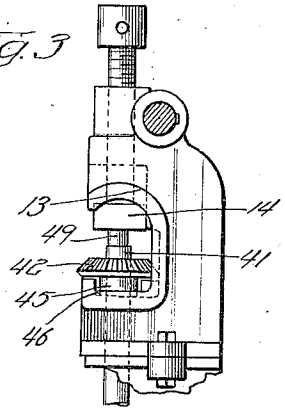
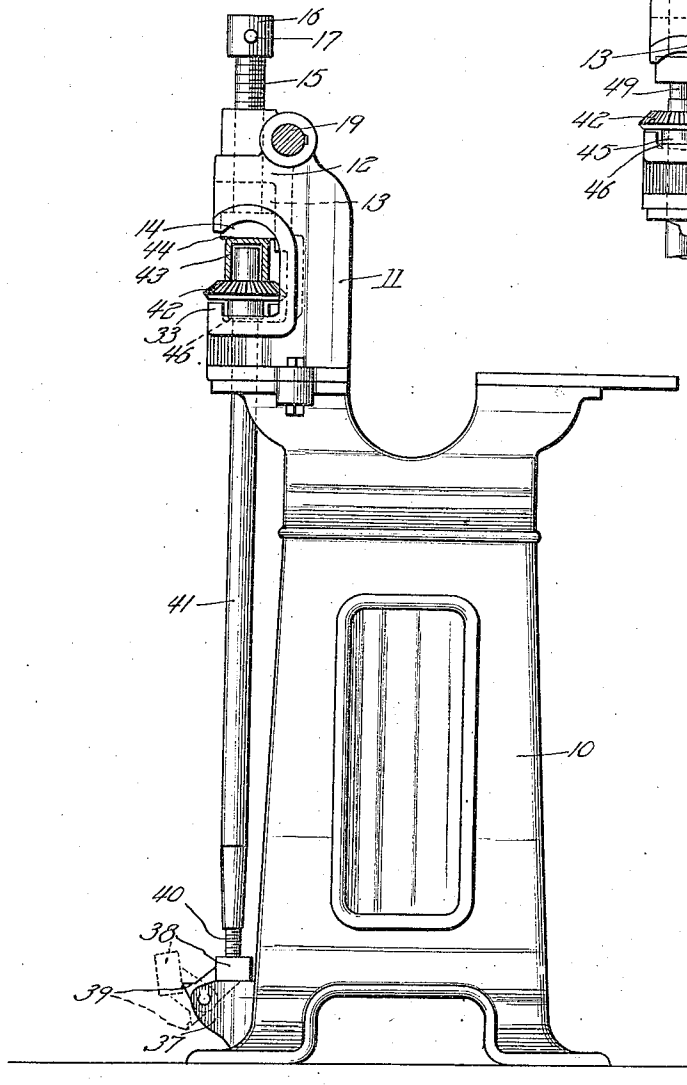


Fig. 2



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AXLE STAND

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Fig. 4

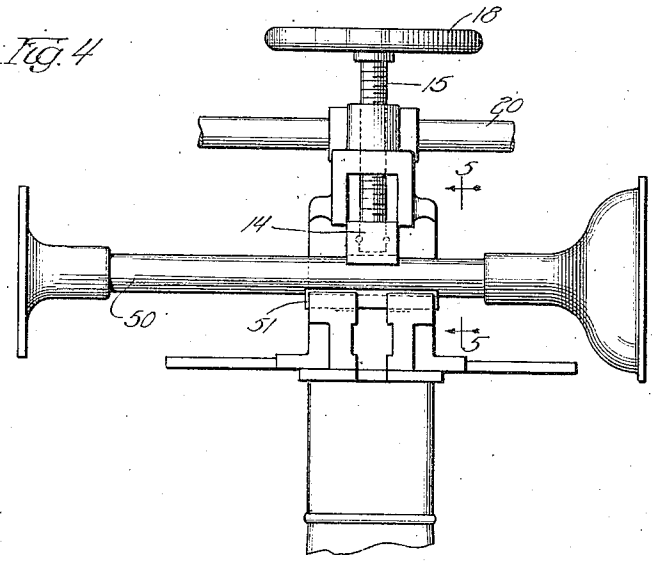


Fig. 5

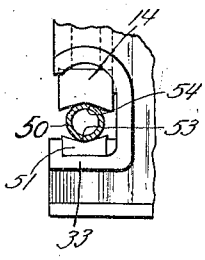


Fig. 6

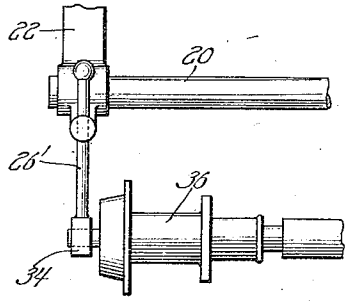
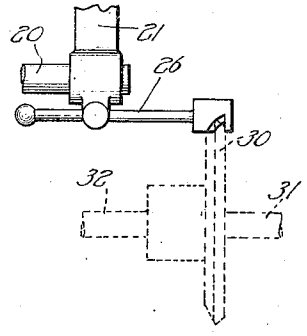


Fig. 7



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Patented Sept. 9, 1924. 1,508,012

UNITED STATES PATENT OFFICE.

FRANK DANIELSON, OF CHICAGO, ILLINOIS.

AXLE STAND.

Application filed June 24, 1920. Serial No. 391,307.

To all whom it may concern:

Be it known that I, FRANK DANIELSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Axle Stands, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to axle stands.

More particularly this invention relates to a stand adapted to hold an exle of a motor vehicle in various positions to make it possible to readily perform certain operations thereon.

One of the purposes of the invention is to provide a stand for holding an axle and removing a gear from or forcing a gear onto the same, by means of a movable jaw member on said stand.

Another purpose of the invention is to provide a stand provided with jaws adapted to clamp an axle housing between them by the interposition of suitable clamping blocks, so as to hold the housing while dis-assembling the same.

A further purpose of the invention is to provide means for holding the ring gear on the rear axle of motor cars from turning when removing the bolts from the same and a still further purpose of the invention is to provide means for holding the drive shaft from turning while working thereon.

Other objects and advantages of the invention will appear as the description of the acompanying drawings proceeds, in which

Fig. 1 is a front elevation of the improved axle stand, showing the same in position for forcing a gear on the axle;

Fig. 2 is a side elevation partly in section thereof;

Fig. 3 is a fragmentary detail side elevational view of the clamping jaws of said stand arranged for forcing a gear off said axle;

Fig. 4 is a fragmentary detail front elevation of the clamping jaws and upper portion of the stand slightly modified showing a rear axle housing clamped therein;

Fig. 5 is a fragmentary detail view partly in section on the line 5—5 of Fig. 4;

Fig. 6 is a fragmentary detail view of certain portions of the device shown at the left of Fig. 1;

Fig. 7 is a similar view of certain portions of the device shown at the right of Fig. 1;

Fig. 8 is a front elevation of the jaw members of the improved axle stand showing the same used as a straightening press; and

Fig. 9 is a side elevation thereof.

Referring now in detail to the drawings, the improved axle stand comprises a base portion 10 and a fixed clamping member 11 secured to the base by bolts or any other suitable means. The clamping member 11 is provided with an upwardly extending portion 12 provided with suitable guides 13 for a movable clamping member 14. The clamping member 14 is provided with a clamping screw 15 free to rotate in said clamping member 14 and having screwthreaded engagement with the upper portion 12 of the clamping member 11. The upper end portion of the clamping screw 15 is provided with a block 16 through which extends a bar 17 by means of which the clamping screw can be turned. Instead of using the bar 17 for turning the screw, a hand-wheel 18 as shown in Fig. 4 may be substituted. A transverse opening 19 is provided in the clamping member at the upper extremity thereof and the opening 19 is adapted to receive a shaft 20 carrying slidably thereon the movable supporting members 21 and 22 which are provided with suitable centers 23 and 24 for holding an axle 25 or any other member therebetween. The supporting members 21 and 22 are provided with handles 26 and 26′ respectively and the handle 26 is provided with an enlarged end portion 27 that has an opening 28 in one side thereof into which projects the beveled edge portion 29.

Referring now to Fig. 7, it will be noted that when the handle member 26 is turned to a horizontal position that the opening 28 is adapted to receive a ring gear 30 which is part of the differential of an automobile and is readily mounted on the rear axle shaft 31. The beveled portion 29 extends between two adjacent teeth on the gear 30 and holds the gear from turning on the shaft when it is desired to remove the bolts from the gear 30, thus preventing the turning of the gear when the wrench is applied to the head of the bolts, it being understood that the shaft 32 is clamped between the movable jaw 14 and the stationary jaw 33 on the jaw portion 11 to hold the same.

The handle portion 26′ has an enlargement 34 thereon which is provided with a square opening 35.

Referring now to Fig. 6, it will be seen that this square opening 35 is adapted to receive the square end at the universal joint on the drive shaft 36 and thus prevents the same from turning, it being understood that the portion to the right in Fig. 6 of the drive shaft is clamped between the movable jaw 14 and the fixed jaw 33 to hold the shaft. It will thus be seen that the drive shaft is clamped in position and held from turning by this means so as to make it easy to operate thereon in making repairs and in assembling and dis-assembling the parts co-operating therewith.

The base portion 10 is provided with a pair of ears 37 extending outwardly from one side thereof and between these ears is pivoted a block 38 provided with an upwardly and rearwardly extending projection 39, the lower base of the block being adapted to rest on the upper edge of the ears 37 when in the position shown in full lines in Figs. 1 and 2.

When in the position shown in full lines in Figs. 1 and 2, the block 38 is adapted to receive the end portion 40 of the rear axle 41 when it is desired to force the gear 42 into position thereon. In order to do this, the hollow cylindrical member 43 provided with a closed end wall 44 is mounted on the end of the shaft with its edge engaging the gear 42, the movable clamping jaw 14 being moved upwardly far enough so that the member 43 can be placed between the same and the gear 42, the gear 42 having previously been placed loosely on the shaft. Upon turning the screw 15 by means of the handle 17 so as to force the clamping jaw 14 outwardly towards the fixed jaw 33, the cup-like member 43 is forced against the gear 42 and forces the same downwardly on the shaft until the upper end of the shaft strikes the end wall 44, the member 43 being so proportioned that the gear 42 will then be in its proper position.

When it is desired to remove the gear 42, this can also be accomplished by the same mechanism as above described by tilting the block 38 to the dotted position shown in Fig. 2, by actuating the same by the foot being applied to the extension 39. It will be noted that the end of the shaft 40 is now free to pass between the ears 37 as the block 38 is out of its path of movement. When this is true the hub 45 of the gear 42 will contact with the bottom of the recess 46 in the fixed jaw portion 33, the shaft being otherwise free of the machine, merely being guided by the opening 47 through the jaw and the opening 48 between the ears 37. A piece of cylindrical shaft 49 or any other suitable member, is placed between the movable jaw 14 and the end of the shaft 41. Now when pressure is applied by means of the screw 15 to the jaw 14 to force the same downwardly, this will force the shaft 41 downwardly through the gear 42 and when the end of the shaft is flush with the upper surface of the gear, it will drop through the same and the gear will be free of the shaft.

In Figs. 4 and 5, another use for the clamping jaws is shown, the same being used in this instance to hold the rear axle housing 50 so as to enable the two halves of the housing to be taken apart. In order to do this, a block 51 is inserted between the housing 50 and the fixed jaw 33. The block 51 and movable clamping block 14 are provided with oppositely directed beveled recesses 53 and 54 which provide wedge faces for tightly holding the axle housing 50.

In Figs. 8 and 9 the axle stand is shown as being provided with certain attachments mounted in the jaws thereof, whereby the same is capable of being used as a straightening press. In order to use the device as a straightening press, a block 55 is mounted in the lower jaw 33. The block 55 is provided with movable supporting members 56 that have overhanging flanges 57, slidably embracing the block 55, so that the same can be adjusted longitudinally thereon. Mounted in the V-shaped groove of the block 14 is a block 59 having a beveled portion 60 to seat in the groove in block 14. The block 59 is provided with a curved face 61, facing toward the lower jaw portion 33. In order to straighten a shaft axle or any other member 62, the member is placed between the jaws and resting on the members 56 and 59, these being spaced a suitable distance apart to properly straighten the member, depending upon the sharpness of the bend that is to be straightened. The screw 15 is then turned down and the shaft axle or other member 62 is straightened by the pressure exerted thereon, the rounded faces of the members 56 and 59 serving to prevent the formation of any sharp bends or kinks in the member 62, when the pressure is applied.

It will thus be seen that a machine has been provided that is capable of performing a large number of different operations upon the rear axle, rear axle housing and drive shaft, of an automobile and that this machine takes the place of numerous machines heretofore necessary to perform these various operations, resulting in considerable economy in the use of equipment and space in the shop.

Having thus described my invention, I desire to have it understood that I do not intend to limit myself to the exact details of structure described and shown in the accompanying drawings except as defined in the following claims:

1. In a device of the character described,

a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, and means co-operating with said upper jaw member to force a gear on said axle, said means comprising a support below said lower jaw member.

2. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, said base having a removable support for the lower end of said axle whereby said upper jaw member is adapted to both force a gear on and off said axle by a downward movement thereof.

3. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, said base having a support for the lower end of said axle pivoted so as to be movable into and out of supporting position relative to said axle whereby said upper jaw member is adapted to both force a gear on and off said axle by a downward movement thereof.

4. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, and a hollow cylindrical member co-operating with said upper jaw member to force a gear on said axle.

5. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, and a hollow cylindrical member co-operating with said upper jaw member to force a gear on said axle, said cylindrical member being provided with an end wall acting as a guide to seat said gear on said axle at the desired point from the end thereof.

6. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, said base having a removable support for the lower end of said axle whereby said upper jaw member is adapted to both force a gear on and off said axle by a downward movement thereof, and a hollow cylindrical member co-operating with said upper jaw member to force a gear on said axle.

7. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, said base having a support for the lower end of said axle pivoted so as to be movable into and out of supporting position relative to said axle whereby said upper jaw member is adapted to both force a gear on and off said axle by a downward movement thereof and a hollow cylindrical member co-operating with said upper jaw member to force a gear on said axle.

8. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, said base having a removable support for the lower end of said axle whereby said upper jaw member is adapted to both force a gear on and off said axle by a downward movement thereof, and a cylindrical member co-operating with said upper jaw member to force a gear off said axle.

9. In a device of the character described a base, a lower jaw member mounted on said base, an upper jaw member mounted to move toward and away from said base, said lower jaw member being provided with openings to receive an axle vertically therethrough, said base having a support for the lower end of said axle pivoted so as to be movable into and out of supporting position relative to said axle whereby said upper jaw member is adapted to both force a gear on and off said axle by a downward movement thereof and a cylindrical member co-operating with said upper jaw member to force a gear off said axle.

10. In a device of the character described a base, movable and stationary jaw members, means for moving said movable jaw member toward said stationary jaw member to clamp a drive shaft between said jaws, said stationary jaw member being provided with an extension having a transverse opening, a shaft mounted in said opening, a pair of supporting members mounted on said shaft and provided with means to clamp the same to said shaft at any desired point, and handles for operating said clamping means, one of said handles being provided with means for engagement with the end of said drive shaft to prevent the same from turning on its axis.

11. In a device of the character described a base, movable and stationary jaw members, means for moving said movable jaw member

toward said stationary jaw member to clamp a drive shaft between said jaws, said stationary jaw member being provided with an extension having a transverse opening, a shaft mounted in said opening, a pair of supporting members mounted on said shaft and provided with means to clamp the same to said shaft at any desired point, and handles for operating said clamping means, one of said handles being provided with a square opening adapted to engage a squared end on said drive shaft to prevent the same from turning on its axis.

12. In a device of the character described a base, movable and stationary jaw members, means for moving said movable jaw member toward said stationary jaw member to clamp an axle between said jaws, said stationary jaw member being provided with an extension having a transverse opening, a shaft mounted in said opening, a pair of supporting members mounted on said shaft and provided with means to clamp the same to said shaft at any desired point, and handles for operating said clamping means, one of said handles being provided with means for engagement with a gear free to turn on said axle, to prevent turning thereof.

13. In a device of the character described a base, movable and stationary jaw members, means for moving said movable jaw member toward said stationary jaw member to clamp an axle between said jaws, said stationary jaw member being provided with an extension having a transverse opening, a shaft mounted in said opening, a pair of supporting members mounted on said shaft and provided with means to clamp the same to said shaft at any desired point, and handles for operating said clamping means, one of said handles being provided with means for engagement between two adjacent teeth of a gear free to turn on said axle to prevent turning thereof.

14. In a device of the character described, a base, movable and stationary jaw members, means for moving said movable jaw member toward said stationary jaw member to clamp an axle between said jaws, said stationary jaw member being provided with an extension having a transverse opening, a shaft mounted in said opening, a pair of supporting members mounted on said shaft and provided with means to clamp the same to said shaft at any desired point, and handles for operating said clamping means, one of said handles being provided with an opening having a beveled portion therein for engagement between two adjacent teeth of a gear free to turn on said axle to prevent turning thereof.

In witness whereof, I hereunto subscribe my name this 18th day of June A. D., 1920.

FRANK DANIELSON.