June 6, 1939. G. H. INMAN 2,161,053

APPARATUS TO OPERATE A JACK

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Fig. 1.

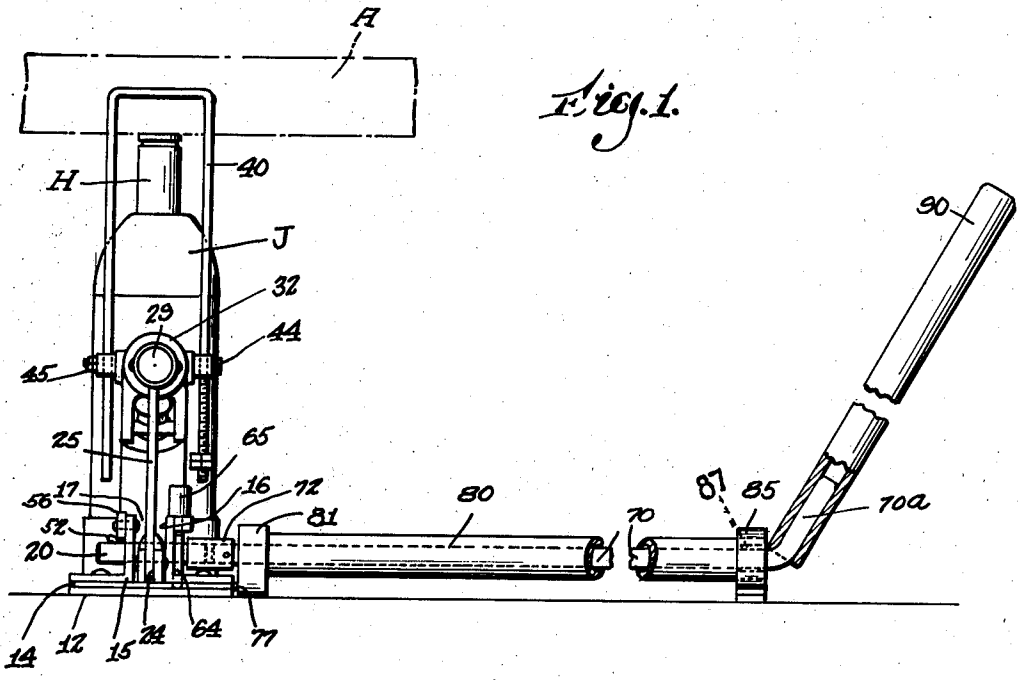


Fig. 2.

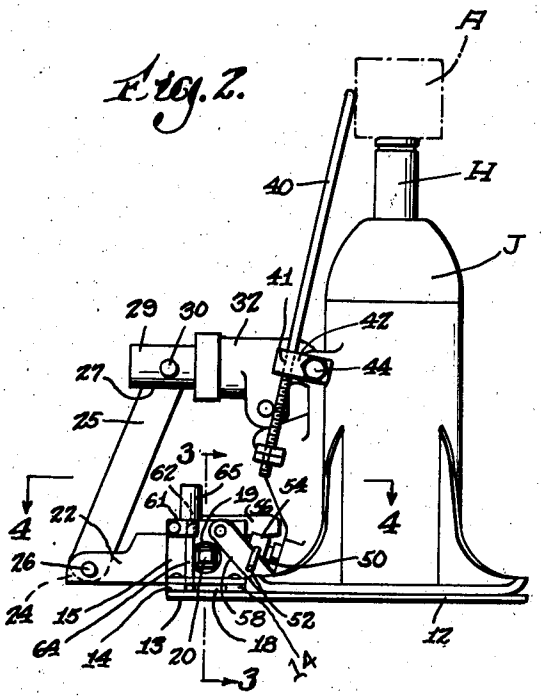
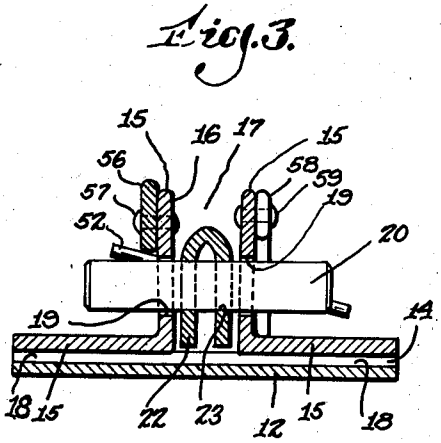


Fig. 3.



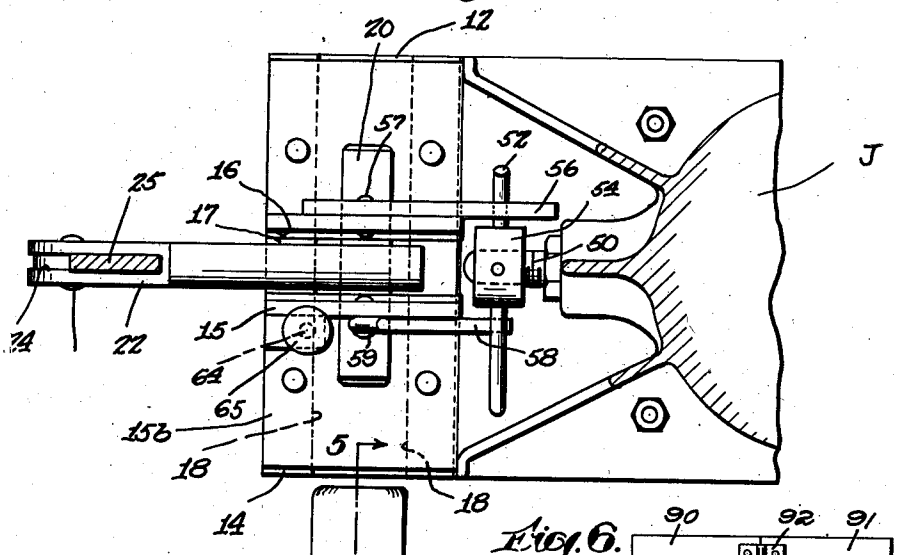
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Fig. 4.



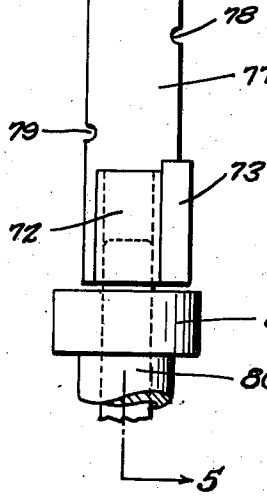


Fig. 6.

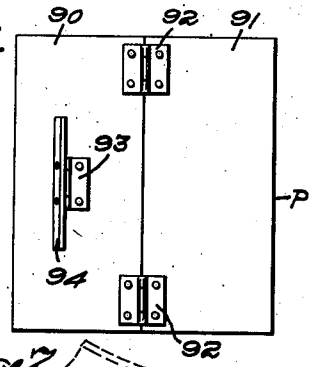


Fig. 7.

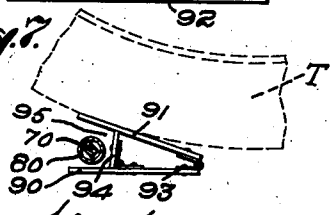
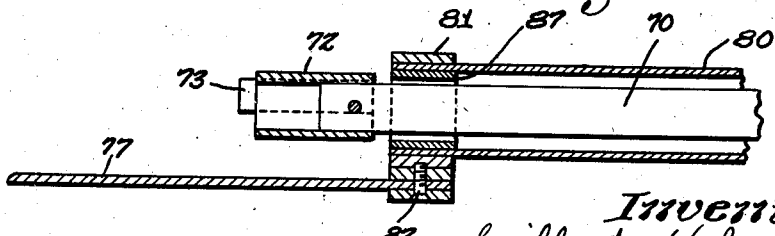


Fig. 5.



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UNITED STATES PATENT OFFICE

2,161,053

APPARATUS TO OPERATE A JACK

Gilbert H. Inman, Taunton, Mass.

Application November 25, 1938, Serial No. 242,237

18 Claims. (Cl. 254—1)

This invention relates to apparatus to operate a jack or other lifting device, and particularly to apparatus that can be operated at the side of a vehicle.

My principal object is to simplify the construction and operation of such apparatus, and to make it adapted for use in raising any wheel on the automobile from the side thereof.

Another object is to provide such apparatus that can be manufactured separate from and attached to a jack and operably connected thereto at any time, or can be made integral with part of the jack structure at the time of manufacture of the latter. A further object is to provide such apparatus that can be manufactured and sold at a low cost, and which can be used to lift various makes and sizes of automobiles.

A still further object is to provide a guide for a jack, movable vertically and laterally, which will serve to correctly position the jack under any desired portion of the vehicle to be raised.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction combination and operative arrangement of parts such as is disclosed by the drawings and specification. The nature of the invention is such as to render it susceptible to various changes and modifications, and, therefore, I am not to be limited to said disclosure; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawings:

Figure 1 is a front elevational view of my apparatus in normal position with the jack under an axle housing ready to commence the lifting operation.

Figure 2 is a side elevational view of my apparatus in normal position, similar to Figure 1.

Figure 3 is an enlarged sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a plan view of my apparatus, the jack being shown broken away, and the actuating arm and associated actuating means also being shown broken away.

Figure 5 is a sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a plan view of a platform, for use with my apparatus, in open position.

Figure 7 is a side elevational view of said platform in erect position supporting a portion of a tire.

As illustrated, the actual lifting of the automobile is done by a common type of jack J such as hydraulic or a lever-operated jack, which is preferably used by placing it under the axle housing A or other lower portion of the automobile. A base 12 is fastened to the under portion of the base of said jack J and extends as at 13 beyond the front of the regular jack base. By front is meant that portion of the jack where the socket member 32 is. This base 12 could be made an integral part of the main base of the jack and manufactured at the same time. Resting on said base extension 13 are two bars 14 spaced apart with a space 18 between them, on which two angle iron supports 15 are fixed to said base extension 13. Said angle iron supports are spaced apart with the main faces 16 of the upright portions opposite each other and providing a space 17 between them. Said space 18 is between the bottoms of both said angle irons 15 and said base extension 13. Each angle iron upright portion has a hole 19, and a connecting rod 20 extends through said holes 19 between said angle iron supports 15, being rotatably therein, its two ends projecting outside of and beyond said angle irons 15. An arm 22 is connected to said connecting rod 20, having a laterally extending hole 23 near one end through which said connecting rod 20 passes, said arm 22 being free to move in said space 17 between said angle irons 15. Said arm 22 is so connected to said connecting rod 20 that rotative movement of the latter moves said arm upwardly and downwardly at an angle. At the end of said arm 22 is a forked portion 24 into the forked space of which one end of a link 25 enters, said arm being pivotally fastened to said link 25 by a pin 26 that extends through said arm forked portion 24 and said link 25. Said link 25 normally extends at an acute angle to said arm 22, that is, when these two parts are at their lowest point. When my apparatus is actuated said arm 22 moves upwardly from its normal horizontal position shown in Figure 2 of the drawings. The other end of said link 25 enters a slot 27 in an elevating lever 29 for said jack J, being freely movable therein, and being held by a pin 30 extending laterally through said lever and link. In said normal position said lever 29 extends substantially horizontal, although the relative positions of these parts may be varied from that shown, and still perform their function. Said elevating lever 29 extends into the usual movable socket member 32 of said jack J, movement of which actuates the well known interior mechanism of said jack.

Adjacent said socket member 32 is a guide 40, which preferably consists of a U-shaped rod, the opposite parts of which rod extends through vertical holes 41 in blocks 42 which are on opposite

sides of said socket member 32, and are held in place by a bolt 44 which extends laterally through an end portion of said socket member 32 and blocks 42, said bolt being held in tightened position by a nut 45. Said guide 40 may be moved upwardly and downwardly in said holes 41 in said blocks 42, and once the desired position is determined it will remain there permanently, as the space between the opposite rod parts of said guide 40 is slightly more than the space between said two block holes 41, thereby providing a spring fit of said guide 40 in said holes 41. When said nut 45 is slightly loosened a rotative movement of said blocks 42 and guide 40 is possible, so that said guide may be moved forward towards said jack head H or backward away from it, as desired. It will thus be seen that said guide is capable of either vertical or lateral movement. It is, of course, desired to have the head H of said jack J come squarely under said automobile axle housing A or other part, and as it is not possible to see clearly under the automobile as the jack J is moved to position, I provide this guide 40, which will be set to extend higher than the jack head H before the lifting operation commences. The result is that when said jack is moved to lifting position, under said axle housing A, at least one of the rod parts of said guide 40 will abut against said axle housing of the automobile, and in this position said jack head will be directly under said axle housing because the distance between a said guide 40 and said jack head is the same as the distance from the outside to the center of said axle housing A. In other words the distance is predetermined, and said guide 40 can be moved farther away from or nearer to said jack head H, as desired, all depending upon the size of the axle or other part to be lifted.

Hydraulic or other jacks J are provided with means outside the jack whereby their interior mechanism is set for an upward lifting movement or a downward movement. The jack illustrated has the usual valve screw 50 which extends into and screw-threadedly unites with the interior of the jack, rotation of which from the outside of said jack results in setting the well known lifting mechanism in the interior for upward or downward movement, all depending upon the direction of rotation of said valve screw 50. While hydraulic jacks are commonly provided with such valve screws 50, other types of jacks are provided with fingers or other members, movement of which will set the interior mechanism of the jack for upward or downward movement, as desired, and my invention is adapted for use with various kinds of such setting means. Extending through said valve screw 50 is a pin 52, rotative movement of which rotates said valve screw 50 from one position to another, and reverse. I have provided a collar 54 which fits over an end portion of said valve screw 50, and through which said actuating pin 52 extends.

When the jack is being prepared for use said valve actuating pin 52 is moved to position by the user's finger to permit upward movement of the interior mechanism of the jack; but when the axle housing A is resting on the jack I provide a valve control lever 56 pivotally fastened as at 57 to an upright portion of a said angle iron 15 which extends directly above said actuating pin 52. Actuation of said lever 56 downwardly brings it into contact with and causes a rotative movement of said pin 52, which rotates said valve screw 50 to thereby set the interior mechanism for a downward movement of said jack head H. When the jack is removed from under the automobile the said pin 52 may again be moved to its opposite position by the hand of the operator, to set it for an upward movement. On the upright portion of the other angle iron 15 is another valve control lever 58 likewise pivotally fastened as at 59 to said other angle iron, and extending therefrom to a point under another part of said actuating pin 52, so that movement of said lever 58 upwardly will likewise set the interior mechanism for a downward movement of said jack head H. Said actuating pin 52, when in either position, extends at an angle, so that movement of one end of said pin downwardly moves the other end of said pin upwardly by a rotative movement of said valve screw 50.

Fastened to the upright portion of one said angle iron 15 is a block 61 in which there is a vertical hole 62. A movable locking or retaining member 64 extends through said block hole 62 and enters a hole in the bottom portion of the said angle iron 15 and into said space 18 below said angle iron. This locking member 64 has a wider head portion 65 which normally rests on the top of said block 61. When said retaining member 64 is drawn upwardly it moves out of said space 18 and frees a tongue 77, as explained later.

The jack J is raised by rotative, reciprocating movement imparted to said connecting rod 20, rotation of less than one-quarter of a turn usually being sufficient. This movement to said connecting rod 20 is imparted by an actuating arm 70 which is partially rotated back and forth by force applied at one end thereof, which end is at the side of the automobile, when my apparatus is used for the purpose of raising an automobile. In this use it extends beyond the side of the wheel to be raised, and is operated at a point at the outer side of the automobile wheel. Said actuating arm 70 has at its inner end a coupling 72 fixed thereto which fits over said arm and extends beyond; and either one of the two projecting ends of said connecting rod 20 extends into the open end of said coupling 72 when my apparatus is ready to be operated. This is accomplished by merely pushing said coupling 72 over an end of said connecting rod 20, whereupon any rotative movement imparted to said actuating arm 70 is likewise imparted to said connecting rod 20, with the result that the jack head H is raised, as previously explained. At one side of said coupling 72 is a thickened or side projecting portion 73 which may extend under said lever 56 or said lever 58, depending upon which side of the jack it is, when said coupling 72 has been pushed over the end of said connecting rod 20 as far as it will go. In that position, rotation of said actuating arm 70 will bring said coupling projecting portion 73 up against said lever 56 or lever 58, and thereby move said lever 56 down or move said lever 58 up, which, in either case, causes said pin 52 and valve screw 50 to move, to thereby set the interior mechanism of said jack J for a downward movement of said jack head H. When an upward movement of said jack head is desired, the said pin 52 is moved to the opposite position by hand, as previously explained.

Ordinarily, when said actuating arm 70 is rotated, neither said coupling 72 nor said projecting portion 73 extends under either of said levers 56 and 58; but said coupling projecting portion 73 may be pushed thereunder by an end thrust movement of said arm 70, as later described, when it is desired to lower said jack head H.

In order to readily move said coupling 72 to its position on said connecting rod 20, and hold the connection firmly during operation of my apparatus, I provide a tongue 77 which extends beyond said arm 70 and coupling 72 and is adapted to enter said space 18 from either side of said jack, depending upon which side the wheel to be raised is. Said tongue has a rabbet or groove 78 in one side edge, and another rabbet or groove 79 extending in from the other side edge, and when said tongue extends fully into said space 18 said locking member 64 extends into one of said rabbets 78 or 79, and thereby holds said tongue in fixed position until said locking member 64 is raised to thereby permit withdrawal of said tongue.

Said actuating arm 70 is enclosed by a tube or housing 80, except at its ends, and is freely movable therein. A collar 81 surrounds and is fixed to the inner end of the said tube 80, and said tongue 77 is fixed as at 82 to said collar 81. At the other end of said tube 80 is another collar 85 which is fixed thereto, and preferably extends slightly beyond the end of said tube 80. Set into said tube 80 a slight distance from each end are bushings 87.

Said actuating arm 70 has a bent handle portion 70*a* at its outer end, which extends from the long, straight portion of said arm 70 at an angle, as shown, said angle preferably being about 60 degrees from horizontal. Said arm 70 is permitted some longitudinal or end play in said tube 80, as the distance between the rear of said coupling 72 and the portion of said actuating arm 70 where said bent handle portion 70*a* bears against said collar 81, is slightly greater than the length of said tube 80. This longitudinal play permits said arm 70 to be pushed inwardly to a point where said coupling projecting portion 73 extends under a said control lever 56 or 58, in which position rotative movement of said arm 70 actuates said lever which in turn moves said valve screw pin 52, as previously described.

A hollow handle 90 fits over said bent handle portion 70*a*, and said actuating arm 70 is actuated by a lateral reciprocating movement thereof of said handle 90, which movement is the force that raises the jack J. Said handle 90 fits over said bent handle portion 70*a* and extends slightly under the top portion and into the interior of said collar 85 so that while in this position no inward or other longitudinal movement of said actuating arm 70 is possible, which assures that said coupling projecting portion 73 will not be moved under either of said control levers 56 or 58 while the jack is being raised to the desired position. Withdrawal of said handle 90 from its position slightly under said collar top portion frees said arm 70 for end thrust movement, and, when it is desired to set the jack interior mechanism to permit a downward movement of the jack head H said arm 70 is merely pushed inwardly and rotated, if necessary until said coupling projecting portion 73 is under a said control lever 56 or 58, whereupon any rotative movement of said arm 70 will raise said control lever. This is true whether the said arm 70 extends to the right side of said jack or to the left side, as said coupling projecting portion 73 can be moved to a position under either said control lever 56 or 58 when said arm 70 is pushed inwardly.

When raising the ordinary automobile with said jack J directly under the axle housing A said actuating arm 70 will extend to one side of the automobile at an angle outwardly of said axle housing A, because the distance between said axle housing A and that portion of the tire T adjacent the ground under which said actuating arm 70 will extend, is greater than the distance between said jack head H and said connecting rod 20. In order to bring said arm 70 at or as near right angles to said axle housing A as possible, and thereby reduce the amount of effort required to elevate said jack head H, I provide a platform P on which the automobile tire may rest while the jack is being operated. Said platform P consists of a lower plate 90 and an upper plate 91 hinged together at the front as at 92. Hinged as at 93 to said lower plate 90 is a supporting bar 94 which, when moved to its erect or supporting position, provides a support for said upper plate 91 and thereby leaves a space 95 between said upper plate 91 and said lower plate 90. Inasmuch as said upper plate 91 when in erect position, extends from said hinge 92 diagonally upward it provides a V-shaped platform, which has its widest opening or space 95 at the rear, and it is through that portion of said space 95 at the rear that said tube 80 and actuating arm 70 are adapted to extend, the said space 95 being sufficient to freely receive said tube 80 and permit it to rest on said lower plate 90. This enables the user to operate said actuating arm 70 at its handle portion 70*a* nearer the said axle housing A, thereby easing the task of elevating the automobile. Said supporting bar 94 in its erect position preferably extends at substantially right angles to said upper plate 91 that rests on top of it, consequently it extends diagonally upward from said lower plate 90 and forms an acute angle with respect thereto. When said platform P is not in use, said supporting bar 94 rests in almost horizontal position on said lower plate 90.

What I claim is:

1. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, a connecting rod operatively connected to said means and extending laterally of the longitudinal axis of said means, and actuating instrumentalities adapted to be operatively connected to and upon actuation to actuate said rod.

2. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, a connecting rod operatively connected to said means and extending at two opposite ends beyond adjacent portions of said means, and actuating instrumentalities adapted to be operatively connected to either end of said rod and adapted upon actuation to actuate said rod.

3. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, upwardly extending supporting means, a connecting rod operatively connected to said actuating means and movably supported in an upwardly extending portion of said supporting means, and actuating instrumentalities adapted to be operatively connected to and upon actuation to actuate said rod.

4. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, base means, supporting means supported by and having a portion spaced from said base means, a member movably mounted in said supporting means and operatively connected to said actuating means, instrumentalities operatively connected to said member and adapted upon actuation to actuate said member, said instrumentalities embodying a tongue adapted to

extend into the said space when said instrumentalities are operatively connected to said member.

5. Apparatus to operate a jack comprising means adapted to be operatively connected to said jack, base means, supporting means supported by and having a portion spaced from said base means at two opposite points, a member movably mounted in said supporting means and operatively connected to said actuating means, instrumentalities operatively connected to said member and adapted upon actuation to actuate said member, said instrumentalities embodying a tongue adapted to extend into the said space at either said point when said instrumentalities are operatively connected to said member.

6. Apparatus to operate a jack comprising a member adapted to be operatively connected with the operative mechanism of a jack, another member operably connected to the first member, another member operatively connected to the second member, and instrumentalities operatively connected to the latter member adapted upon actuation to actuate said latter member, said first and third members normally extending in a lateral direction and said second member normally extending in an upward direction.

7. Apparatus to operate a jack comprising a lever adapted to be operatively connected with the operative mechanism of a jack, a link operably connected to said lever, an arm operatively connected to said link, and instrumentalities operatively connected to said arm adapted upon actuation to actuate said arm.

8. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, base means, supporting means supported by and having a portion spaced from said base means, a member movably mounted in said supporting means and operatively connected to said actuating means, instrumentalities operatively connected to said member and adapted upon actuation to actuate said member, said instrumentalities embodying a tongue adapted to extend into the said space, and a coupling adapted to connect with said member when said instrumentalities are operatively connected to said member.

9. In combination, a jack having a base, and apparatus to operate said jack comprising a base portion extending outwardly from said jack base, two supporting members supported by said base portion and spaced laterally apart, a connecting rod movably mounted in said two supporting members and extending across said space, actuating means operatively connected to said jack embodying a member extending into said space and movably connected to said rod, and actuating instrumentalities adapted to be operatively connected to and upon actuation to actuate said rod.

10. In combination, a jack having a base, and apparatus to operate said jack comprising a base portion extending outwardly from said jack base, two supporting members supported by said base portion and spaced laterally apart and each having a portion spaced vertically from said base portion, a connecting rod movably mounted in said two supporting members and extending across said lateral space, actuating means adapted to be operatively connected to said jack embodying a member extending into said lateral space and movably connected to said rod, and actuating instrumentalities adapted to be operatively connected to and upon actuation to actuate said rod embodying a member adapted to extend into said vertical space and assist in firmly maintaining the operative connection between said instrumentalities and rod.

11. Apparatus to operate a jack in combination with a jack having control means adapted upon actuation to shift the direction of movement of the lifting mechanism of the jack as desired, said apparatus comprising actuating means operatively connected to said jack, supporting means, a member movably mounted in said supporting means and operatively connected to said actuating means, lever means movably mounted to said apparatus and extending to a point with relation to said control means whereby actuation of said lever means will actuate said control means, and actuating instrumentalities adapted to be operatively connected to said member embodying means adapted to be moved to a position relative to said lever means, whereby upon actuation said lever means is actuated.

12. Apparatus to operate a jack in combination with a jack having control means adapted upon actuation to shift the direction of movement of the lifting mechanism of the jack as desired, said apparatus comprising actuating means operatively connected to said jack, supporting means, a member movably mounted in said supporting means and operatively connected to said actuating means, two levers movably mounted to said supporting means at opposite sides thereof and extending to a point with relation to said control means whereby actuation of either said levers will actuate said control means, and actuating instrumentalities adapted to be operatively connected to said member embodying means adapted to be moved to a position relative to either of said levers whereby upon actuation a said lever is actuated.

13. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, supporting means, a connecting rod operably connected to said means and mounted in said supporting means and adapted to rotatively move therein, and actuating instrumentalities adapted to be connected to and upon actuation to actuate said rod, said instrumentalities embodying an actuating arm adapted to rotatively move, a coupling at one end of said arm adapted to fit over a portion of said rod and cause said rod to rotatively move with said arm, said arm extending sidewise of the longitudinal axis of movement of said actuating means.

14. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, supporting means, a connecting rod operably connected to said means and mounted in said supporting means and adapted to rotatively move therein, and actuating instrumentalities adapted to be connected to and upon actuation to actuate said rod, said instrumentalities embodying an actuating arm adapted to rotatively move, a handle portion extending from one end of said arm upwardly at less than a perpendicular angle to said arm, a coupling at the other end of and extending beyond said arm and adapted to fit over a portion of said rod and cause said rod to rotatively move with said arm, said arm extending sidewise of the longitudinal axis of movement of said actuating means.

15. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, base means, supporting means supported by and having a portion spaced

from said base means, instrumentalities operatively connected to said actuating means and adapted upon actuation to actuate said actuating means, said instrumentalities embodying a tongue adapted to extend into said space when said instrumentalities are operatively connected to said actuating means, and locking means adapted to cooperate with said tongue to hold said tongue in said space.

16. Apparatus to operate a jack comprising actuating means adapted to be operatively connected to said jack, base means, supporting means supported by and having a portion spaced from said base means, instrumentalities operatively connected to said actuating means and adapted upon actuation to actuate said actuating means, said instrumentalities embodying a tongue adapted to extend into said space when said instrumentalities are operatively connected to said actuating means, said tongue having an opening therein and a member adapted to extend into said tongue opening when said tongue is in said space and thereby lock said tongue therein.

17. Apparatus to operate a jack in combination with a jack having control means adapted upon actuation to shift the direction of movement of the lifting mechanism of the jack as desired, said apparatus comprising actuating means operatively connected to said jack, supporting means, a connecting rod operatively connected to said actuating means and extending laterally of said means and mounted for rotative movement in said supporting means, lever means movably mounted to said supporting means and extending to a point with relation to said control means whereby actuation of said lever means will actuate said control means, and actuating instrumentalities adapted to be operatively connected to said rod embodying an arm, a coupling on one end of said arm, said coupling being adapted to fit over a portion of said rod and cause said rod to rotatively move with said arm, said coupling being adapted by end thrust movement to extend opposite said lever means whereby rotative movement of said arm will cause said coupling to actuate said lever means and said control means.

18. Apparatus to operate a jack in combination with a jack having control means adapted upon actuation to shift the direction of movement of the lifting mechanism of the jack as desired, said apparatus comprising actuating means operatively connected to said jack, a base portion, supporting means supported by and having a portion spaced vertically from said base portion, said vertical space being at two opposite sides of said supporting means, a connecting rod operatively connected to said actuating means and mounted for rotative movement in said supporting means and having two ends extending beyond said supporting means in the same opposite directions as said two opposite sides, two levers movably mounted to said supporting means at opposite sides thereof and each extending to a point with relation to said control means whereby actuation of a said lever will actuate said control means, and actuating instrumentalities adapted to be operatively connected to said rod embodying an arm, a coupling on one end of said arm adapted to fit over either said end of said rod and cause said rod to rotatively move with said arm, said coupling being adapted by end thrust movement of said arm to extend to a point opposite either said lever whereby rotative movement of said arm will actuate a said lever and said control means, a tongue extending from said instrumentalities beyond said coupling and adapted to extend into a said space at either of said opposite sides before and when said coupling is over said rod.

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