H. H. BURNS.

JACK.

APPLICATION FILED MAY 3, 1919.

1,365,656.

Patented Jan. 18, 1921.

2 SHEETS—SHEET 1.

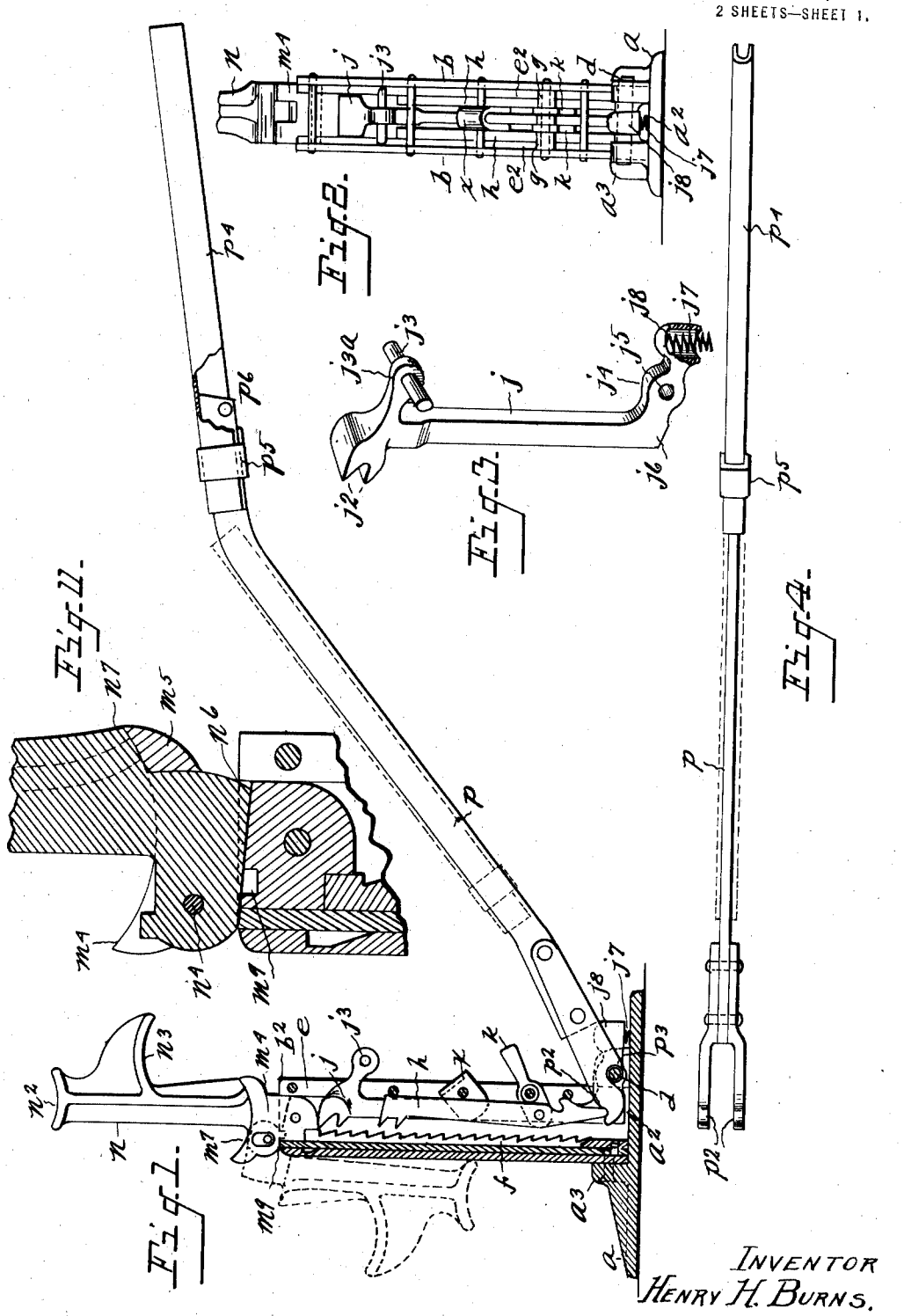


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 11.

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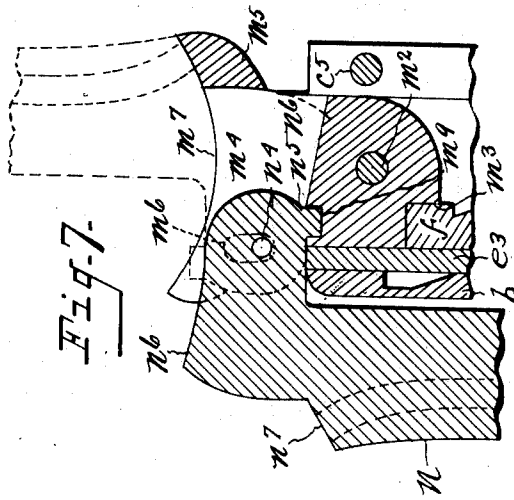


Fig. 7.

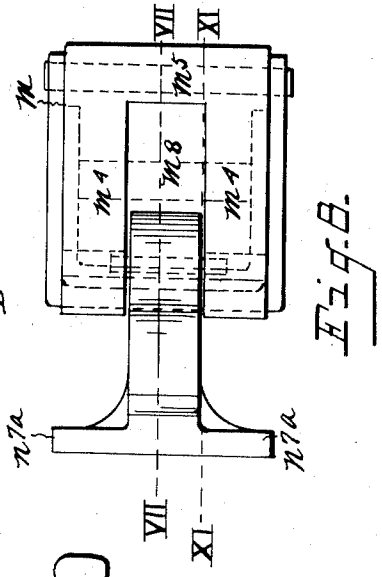


Fig. 8.

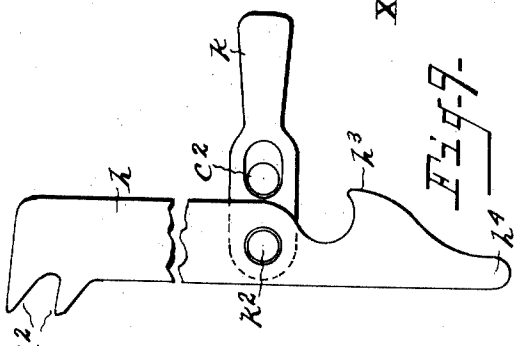


Fig. 9.

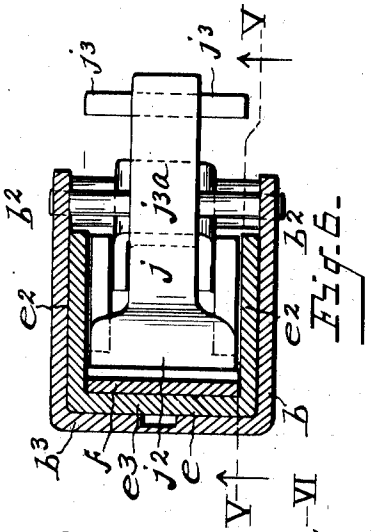


Fig. 6.

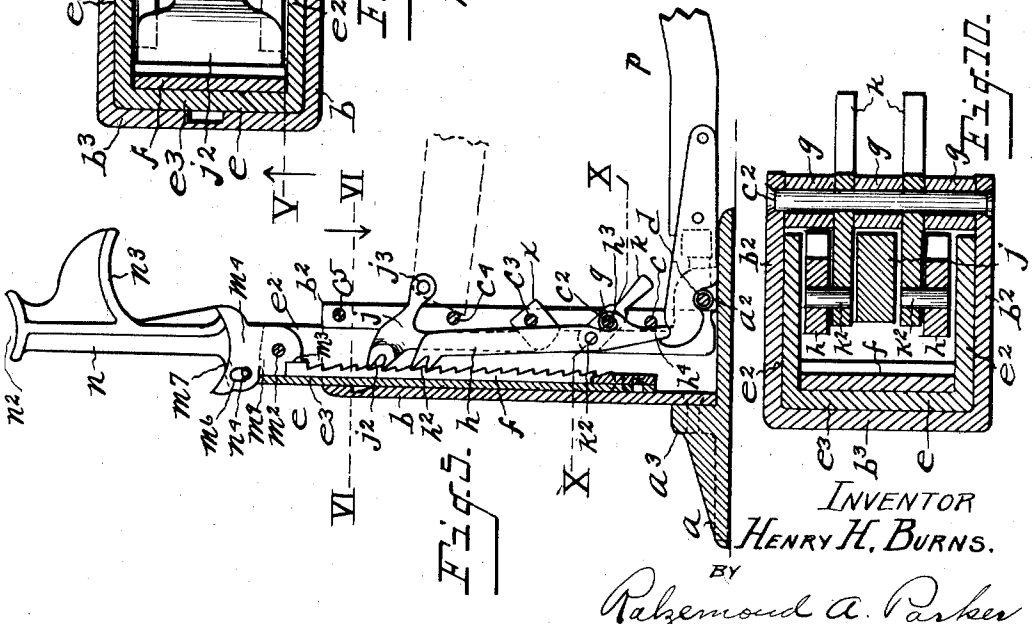


Fig. 5.

Fig. 10.

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1,365,656. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed May 3, 1919. Serial No. 294,412.

To all whom it may concern:

Be it known that I, HENRY H. BURNS, a citizen of the United States, residing at Battle Creek, county of Calhoun, State of Michigan, have invented a certain new and useful Improvement in Jacks, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to jacks for raising vehicles and a special object of my improvements is to provide a jack for raising the wheel of an automobile from the ground that shall be easily and quickly operated, that shall hold the vehicle firmly in its different positions, that is adapted to vehicles having axles of different road clearances, that may be readily and cheaply made and that shall be little liable to deterioration in use.

I secure this object in the apparatus illustrated in the accompanying drawings in which;

Figure 1 is an elevation of a jack embodying my invention partly in section.

Fig. 2 is an elevation looking from the right of Fig. 1, the operating lever being omitted.

Fig. 3 is a perspective view of the holding pawl.

Fig. 4 is a plan of the extensible lever used for operating the jack.

Fig. 5 is an elevation partly in section on the line V—V Fig. 6, similar to Fig. 1, but showing the parts in the different positions.

Fig. 6 is a section on the line VI—VI Fig. 5 to an enlarged scale.

Fig. 7 is a detail section on the line VII—VII Fig. 8.

Fig. 8 is a plan view of the parts shown in Fig. 7.

Fig. 9 is a detail elevation of one of the actuating pawls.

Fig. 10 is a section on the line X—X Fig. 5 to an enlarged scale.

Fig. 11 is a section on the line XI—XI Fig. 8.

a is a cast pedestal having the plane bearing surface a^2 and a flange or ridge a^3 together forming the base of the apparatus. b is a standard of U-shape in cross section, as shown distinctly in Fig. 6 having the two side portions b^2 b^2 and the rear web b^3 joining the adjacent edges of said side portions. The standard b is firmly secured above the flat bearing portion a^2 by riveting its lower end to the flange a^3 thus the lower end of the standard b rests upon the bearing surface a^2 and is rigidly secured in its position by rivets extending horizontally through the flange a.

There is a plunger e having the side portions e^2 e^2 and the rear portion e^3. This latter bears against the portion b^3 of the standard b and is adapted to slide thereon while the side portions e^2 bear against the side portions b^2 of the standard. There is a ratchet tooth bar f, having the perpendicular faces of its teeth downward and the sloping faces upward, rigidly secured to the portion e^3 of the plunger e.

c c^2 c^3 c^4 c^5 are bars bolted or riveted into the side portions b^2 of the standard b near their free edges and extending transversely across said standard. d is a similar bar extending transversely across the bearing surface a^2 of the base a and secured a short distance above and parallel to said surface.

g g g (Fig. 10) are three friction rollers sleeved upon the cross bar, or rod, c^2. h h are two lifting pawls having double teeth h^2 at their upper ends adapted to engage the teeth of the ratchet bar f. j is a pawl having two branches at right angles to each other, as shown most distinctly in Fig. 3. One branch extending vertically and expanded laterally at its upper end where it terminates in double teeth j^2. The vertical branch, or arm, terminates in an extended bearing surface j^6 at its lower end which engages against the bearing surface a^2 of the base a.

The other branch j^4 of the pawl j extends horizontally and is pivoted by the bar d passing through an aperture j^5 at its center. There is an inverted cup j^8 formed at the outer end of the branch j^4 in which engages a pressure spiral spring j^7 which acts to turn the pawl j about the bar d to force the teeth j^2 into engagement with the teeth of the ratchet bar f.

j^{3a} is a lug extending outward from the upper end of the vertical branch of the pawl j and having a cross bar or rod j^3 fixed in its outer end.

k k are pivoted lever arms having handles at their outer ends and provided with elongated slots at their centers through which

slots passes the rod or bar e^2 to pivotally secure said levers in place. The levers $k\ k$ are interposed between the end and the center rollers $g\ g\ g$ and extend inward between the lifting pawls $h\ h$ and holding pawl j as distinctly shown in Fig. 10. The inner ends of the levers $k\ k$ are pivotally secured by pins $k^2\ k^2$ to the lifting pawls $h\ h$.

m is a cast iron block, its lower portion fitting between the side pieces $e^2\ e^2$ of the channel iron bar e and resting against the surface and upper edge of the rear portion e^3 of said bar. The casting m is provided with a groove m^8 (Fig. 8) centrally thereof and extending partly through the same so as to form the two side cheeks $m^4\ m^4$ with the cross bar m^5. The upper surface of the casting m is made concave, in arcuate form in cross section of the casting, as shown at m^7. m^6 represents a pair of vertically extending slots through the cheeks $m^4\ m^4$ toward the edge thereof remote from the cross piece m^5 and adjacent to the open end of the slot m^8 and above the rear portion e^3 of the reciprocating channel bar or plunger e. m^9 is a transverse slot formed in the casting m in the lower wall of the slot m^8 adjacent to the open end of said slot. m^3 is a transverse slot or indentation in the lower wall of the casting m adapted to fit over the upper end of the ratchet bar f to form an additional holding means for said bar.

n is a rod pivoted at one end and one side by pintles n^4 extending into the slots m^6. The rod n is located and adapted to turn in the slot m^8 in the casting m. The free end of the rod n is shaped similar to the surface m^7, to adapt it for a holding means. n^3 is a lug extending laterally from the rod n and having one of its surfaces shaped for receiving an axle of the vehicle. The rod n is turned downward to the position shown in dotted lines in Fig. 1 in which case the axle may be engaged by the surface n^3 at one level or if an axle is at a somewhat higher level it may be engaged by the surface m^7 of the block m or if there is an axle at a still higher level the rod n may be turned to the vertical position as shown in full lines in Figs. 1 and 5 so that said axle may be engaged by the surface n^2. When the rod n is turned to the position shown in dotted lines in Fig. 1 and shown in part in full lines in Fig. 7, it rests upon the upper edge of the portion e^3 of the reciprocating plunger and it is provided with a lug n^5, which engages in the transverse slot m^9 in the casting m. This forms a strong and firm support for the rod in this position and brings no strain upon the pintles n^4 because of the elongated slots m^6, the walls of which do not engage the pintles in this position. When turned to its vertical position the rod n bears with an extended surface n^6 upon a corresponding surface of the plug m as shown quite clearly in Fig. 11. In this position a shoulder n^7 upon the rod n engages the cross piece m^5 of the casting m and this shoulder is extended laterally as indicated at n^{7a} Fig. 8, so that it shall bear nearly throughout the entire breadth of the block or casting m.

p is the actuating lever. This is pivoted with two plates p^2 secured at one end to form forks having engaging notches at their outer ends. The handle of the lever p is formed with an extensible portion p^4 which is inverted U-shape in cross section and engages over the handle of the lever p so as to slide thereon. It is held from disengagement by a metal band p^5. p^3 is a notch formed in the forks p^2 of the lever p at their lower edges adapted to engage over the cross bar or rod d.

x is a U-shape strip of metal pivoted upon the cross bar or bolt e^3 and having its branches extending between the lifting pawls $h\ h$ and the holding pawl j. This is free to turn about its pivot e^3 and hold the pawls in their relative lateral position and obviates friction between the pawls.

The operation of the above described apparatus is as follows:

The actuating lever p is placed in the position shown in Fig. 1, the notch p^3 engaging over the bolt d and the end of the branches p^2 engaging under the lower ends h^4 of the lifting pawls $h\ h$. A branch p^2 comes upon each side of the holding pawl j. The outer arm of the lever p is then depressed forcing the pawls $h\ h$ upward until their lower ends h^4 engage the cross bar or rod e and a spur h^3 engages under the cross bar e^2 or a friction sleeve upon said cross bar. The raising of the pawls $h\ h$ forces the ratchet bar f upward carrying the plunger e up and raising the axle which may be engaged by said plunger. When the outer end of the lever p is raised the pawls $h\ h$ drop back to their original position by gravity, the teeth h^2 engaging teeth of the ratchet bar at a lower level and then the operation may be repeated until the plunger e is forced upward as far as desired. When the lifting pawls h are in their lower position the spurs h^3 engage against the cross bar e with their inclined lower surfaces carrying the outer ends in said bars out of engagement with the teeth of the ratchet bar as shown in Fig. 1. When it is desired to lower the axle resting upon the plunger e the outer end of the lever p is placed against a cross bar e^4 and a hole p^6 through said outer end near one of its edges engages over a pintle j^3 in the lug j^{3a} extending laterally from the upper end of the holding pawl j as indicated in dotted lines in Fig. 5. By depressing the outer end of the lever the upper end of the pawl j is drawn outward disengaging its teeth from those of the

ratchet bar and allowing the plunger to fall. If the lifting pawls h are in their lower position as shown in Fig. 1 the plunger will fall promptly to its lowest position. If it is desired to lower the plunger slowly the levers k are manipulated to engage the teeth h^2 of said lifting bars before the teeth j^2 of the holding bar are withdrawn from engagement with the ratchet teeth and thus the plunger will be allowed to descend by repeating said operation in a step by step motion.

The operating lever handle may be extended to reach a convenient operating position or secure a greater leverage and when folded together affords a convenient handle to be grasped by the operator.

What I claim is:

1. In an apparatus of the kind described, a base, a plunger guided with respect to said base to reciprocate vertically and provided with ratchet teeth, a holding pawl having its lower end contiguous to said base extending upward and having a tooth toward its upper end engaging said ratchet teeth, the surface of the lower end of said pawl bearing upon an exterior surface of said base.

2. The combination of claim 1 when the holding pawl has a plurality of teeth toward its upper end engaging the ratchet teeth.

3. In an apparatus of the kind described, a base, a plunger guided to reciprocate vertically with reference to said base and provided with ratchet teeth, an actuating pawl having its upper end provided with a tooth adapted to engage said ratchet teeth and extended downward to a point adjacent to said base, and an actuating lever adapted to removably bear on said base with an exterior surface and engage the lower end of said pawl.

4. In an apparatus of the kind described, the combination of a base, a fulcrum supported by said base, a reciprocating plunger guided to move vertically with reference to said base and provided with ratchet teeth, a holding pawl provided at its upper end with teeth engaging said ratchet teeth, said ratchet teeth extending laterally beyond the tooth of said pawl on each side, an actuating pawl on each side of said holding pawl having a tooth at its upper end adapted to engage said ratchet teeth and extending downward to a point adjacent to said base, and an operating lever engaging said fulcrum at said base and operatively engaging the lower ends of said actuating pawls.

5. In an apparatus of the kind described, a base, a reciprocating plunger guided to reciprocate vertically with reference to said base and provided with ratchet teeth of considerable extent, a holding pawl provided at its upper end with teeth for engaging said ratchet teeth, an actuating pawl upon each side of said holding pawl having a tooth at its upper end adapted to engage said ratchet teeth and extending downward to a point adjacent to said base, an operating lever adapted to engage a fulcrum supported by said base and to engage the lower ends of said actuating pawls and a pivoted U-shaped piece having its branches extending between said pawls.

6. In an apparatus of the kind described, a base, a reciprocating plunger guided to reciprocate vertically with reference to said base and provided with ratchet teeth of considerable extent, a holding pawl provided at its upper end with a tooth for engaging said ratchet teeth, an actuating pawl upon each side of said holding pawl having a tooth at its upper end adapted to engage said ratchet teeth and extending downward to a point adjacent to said base, an operating lever adapted to engage a fulcrum supported at said base and to engage the lower ends of said actuating pawls, a lever pivoted upon a stationary support and adapted to be manipulated at one end to actuate said lifting pawls, and means for withdrawing the teeth of said holding pawl from engagement with said ratchet teeth.

7. In an apparatus of the kind described, a base, a plunger guided to reciprocate vertically with respect to said base, a rod pivoted to the upper end of said plunger to adapt it to be turned to the side of said plunger or to be turned to form an extension of said plunger, and a laterally extending bearing surface on said rod, said rod being adapted to engage and support an axle on said laterally extending bearing surface when said rod is turned to the side of said plunger.

8. In an apparatus of the kind described, a reciprocating plunger, a rod pivoted to the end of said plunger so as to have lost motion at the joint, a horizontal transverse slot in said plunger and a lug on said rod adapted to engage with its outer edge, the wall of said transverse slot and support said rod when the rod is turned to the side of said plunger for the purpose described.

9. In an apparatus of the kind described, a plunger having a horizontal slot in its upper end, a rod pivoted with lost motion in said slot, said rod being adapted to turn to a position forming an extension of said plunger, the end of said rod being provided with an engaging surface corresponding to the lower wall of said slot and engaging the same in said position of said rod.

10. In an apparatus of the kind described, a plunger having a slot in its end, a rod pivoted in said slot near the side of said plunger, said plunger being provided with a cross piece extending across said slot at the portion thereof remote from said pivot, said rod being provided with a shoulder adapted to engage said cross piece, said rod

being provided with an engaging surface adapted to engage the lower wall of said slot when said rod is turned to the position forming an extension of said plunger.

11. In an apparatus of the kind described, a base a plunger guided to reciprocate vertically with respect to said base, a rod pivoted to the upper end of said plunger to adapt it to be turned to the side of said plunger or to be turned to form an extension of said plunger, a laterally extending bearing surface on said rod, said rod being adapted to engage and support an axle on said laterally extending bearing surface when said rod is turned to the side of said plunger, a transverse slot in said plunger and a lug on said rod adapted to engage with its outer edge the wall of said transverse slot and support said rod when the rod is turned to the side of said plunger for the purpose described.

12. In apparatus of the kind described, a plunger guided to reciprocate longitudinally and provided with ratchet teeth along its side, a pawl extending parallel to said plunger and adjacent thereto having a tooth toward one end adapted to engage the teeth on said plunger, said pawl being pivoted at a distance from its engaging tooth and adapted to reciprocate a cam surface at a distance from said pivot and a lug adapted to be engaged by said cam surface to cause oscillation of said pawl about its pivot.

In testimony whereof, I sign this specification.

HENRY H. BURNS.