July 7, 1931. L. E. RUSSELL, JR., ET AL 1,813,426

PEDAL JACK

Filed Jan. 21, 1929 2 Sheets-Sheet 1

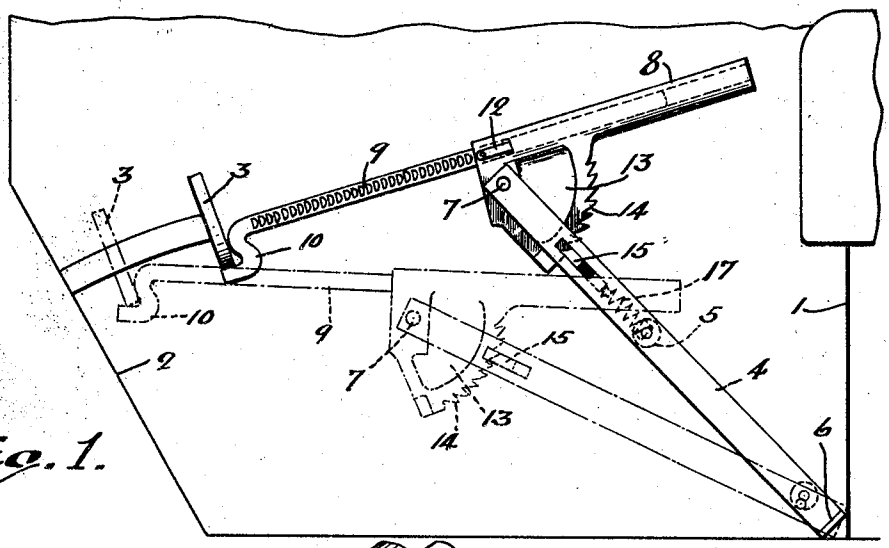


Fig. 1.

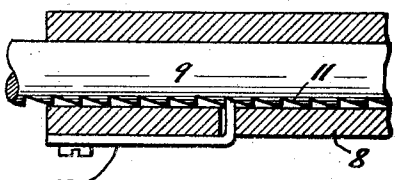


Fig. 6.

Fig. 2.

Linus E. Russell Inventor

By and George E. Peters

F. L. Walker Attorney

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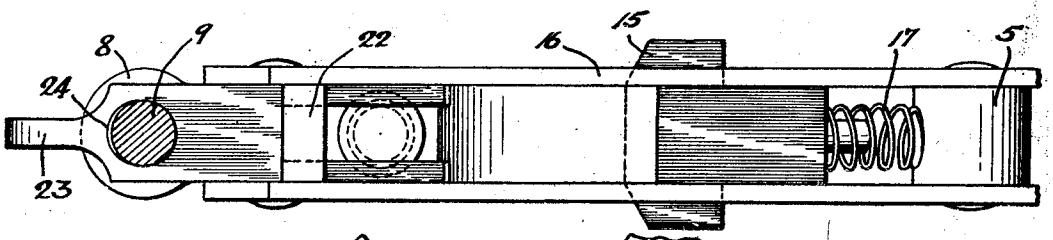


Fig. 4.

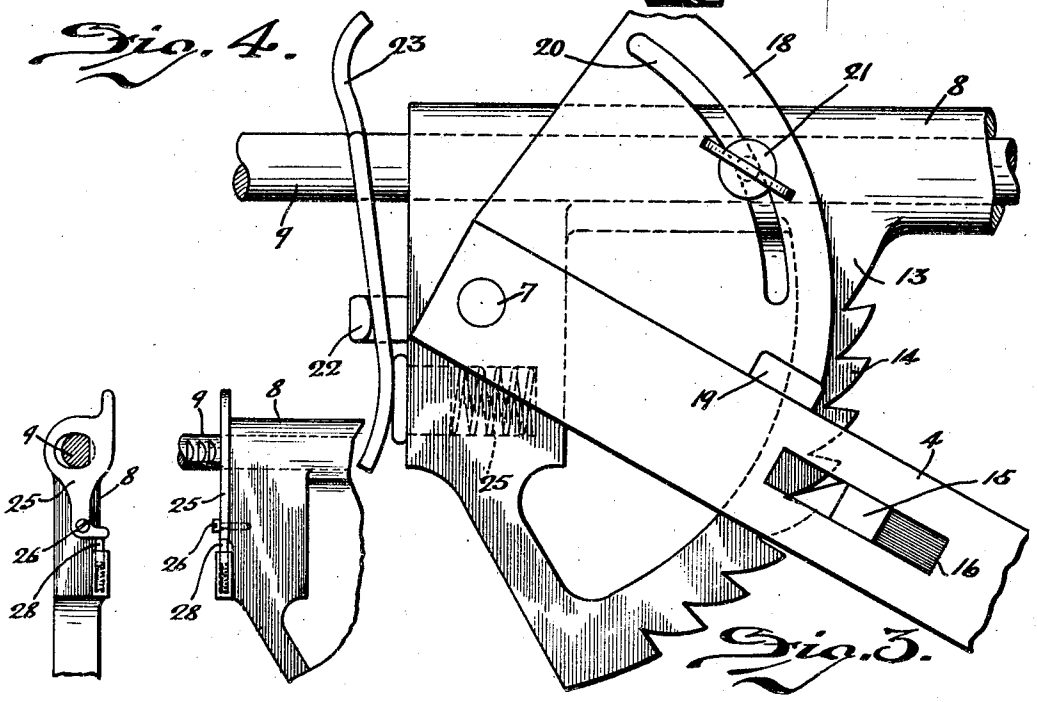


Fig. 3.

Fig. 7. Fig. 8.

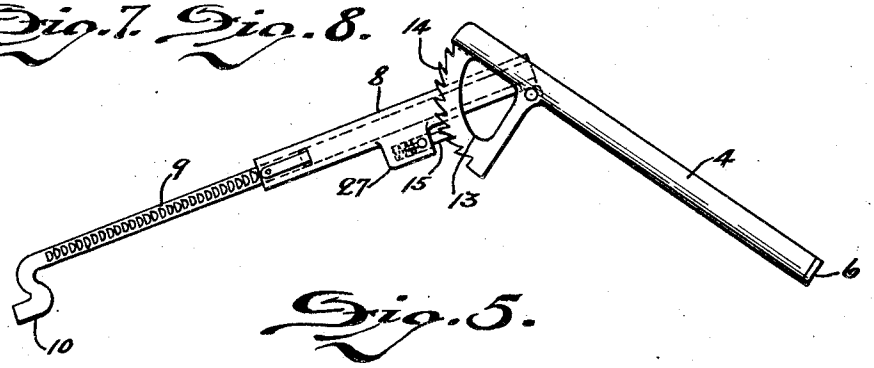


Fig. 5.

Inventor

Linus E. Russell

George E. Peters

By J. E. Walker Attorney

Patented July 7, 1931 1,813,426

UNITED STATES PATENT OFFICE

LINUS E. RUSSELL, JR., AND GEORGE E. PETERS, OF SPRINGFIELD, OHIO

PEDAL JACK

Application filed January 21, 1929. Serial No. 334,062.

This invention relates to an adjustable spacer or pressure jack and particularly to such device of the toggle joint type.

The present device has been primarily designed for use as a pedal jack for depressing and holding in operative position the brake pedal of a motor vehicle while the wheel brakes, particularly brakes of the fourwheel type, are being adjusted. In making such brake adjustment, it is necessary that the brake pedal be held in its depressed position. After the brake pertaining to each wheel has been properly adjusted, it is necessary that the pedal be released and again set in its operated or depressed position to exactly the same extent while the brake pertaining to each succeeding wheel is being adjusted. Numerous forms of brake pedals have heretofore been designed. However to insure rapidity of operation and accuracy of adjustment, there is contemplated in the present invention a spacer jack comprising a pair of inter-pivoted arms forming a toggle joint. One of the arms is preferably extensible and contractible to accommodate the device to a wide range of adjustment. Locking means is provided for securing the extension section of such arm in its adjusted position. At the same time additional locking or clutch means is provided for holding the interpivoted arms in any intermediate position within their range of relative angular adjustment. In the present case this locking means consists of a ratchet head carried by one member and a detent pawl carried by the other member and engaging such head.

While the present spacer jack has been illustrated and will be described in its application to the brake pedal of a motor vehicle, it is not limited to such use, but may be employed for various other purposes such as bracing tribbing in trenches, holding concrete forms, and for bracing or supporting various structures, particularly in such applications where it is desirable that an adjustable brace or support may be quickly and easily applied and removed.

The object of the invention is to simplify the structure as well as the means and mode of operation of adjustable braces or spacer jacks whereby they will not only be cheapened in construction, but will be more efficient in use, positive in operation, uniform in action, capable of being easily and quickly adjusted, and unlikely to get out of repair.

A further object of the invention is to provide a brace or spacer member having a comparatively wide range of adjustability.

A further and important object of the invention is to provide an adjustable spacer jack or brace member which will be convenient and provided with a suitable handle affording increased leverage in applying the brace or jack.

A further object of the invention is to provide such brace or spacer jack having an extendible and contractible arm and improved means for automatically locking such arm against retraction.

A further object of the invention is to provide improved locking means for maintaining the interpivoted members of the toggle device in their adjusted position.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation of their equivalents as hereinafter described and set forth in the claims.

In the accompanying drawings wherein is shown the preferred but obviously not necessarily the only form of embodiment of the invention, Fig. 1 is a side elevation of the adjustable spacer jack or brace member, forming the subject matter hereof, applied to the clutch pedal of a motor vehicle, showing by dotted lines its operated position. Fig. 2 is an enlarged detail view. Fig. 3 is an enlarged detail view embodying modification. Fig. 4 is an end view of the structure shown in Fig. 3. Fig. 5 is a side elevation of a further modification. Fig. 6 is a longitudinal detail section of the extensible arm of the brace. Figs. 7 and 8 are side and end elevations respectively of a further modification.

Like parts are indicated by similar characters of reference throughout the several views.

In the accompanying drawings, 1 indicates the seat of a motor vehicle of which 2 is the floor board and 3 the brake pedal. The present spacer jack is adapted to abut at one end upon the seat 1 of the vehicle, and at its opposite end upon the brake pedal 3. By adjustment of the toggle jack toward its aligned position pressure is applied to the brake pedal 3 to depress the pedal and hold it in such depressed position.

The jack comprises two interpivoted arms. The arm 4 consists of parallel spaced bars separated by intermediate spacers 5. The free ends of such bars are preferably though not necessarily outturned at 6 to afford a foot or rest for engagement with an abutment. At its opposite end the arm 4 is pivoted at 7 to the coacting arm of the toggle jack which consists of a tubular section 8 in which is telescopically mounted for longitudinal extension and contraction, an extension rod 9. The end of the rod 9, which forms the effective portion of the second toggle arm, is formed at its head 10 to agree with the member to be engaged, which in this case is the head of the brake pedal 3. Obviously, if the jack is to engage a flat surface, as for example a cribbing plank or a concrete form, the head 10 would be correspondingly formed with a comparatively flat bearing surface. The tubular portion 8 extends in reverse direction beyond the pivotal connection 7 to provide a suitable handle affording increased leverage for deflecting the toggle joint.

While any suitable or convenient form of locking device or clutch may be employed for holding the rod 9 in its extended position and preventing retractive movement when subjected to pressure, the preferred method is to provide in the side of the rod 9, a series of ratchet teeth 11. These ratchet teeth 11 are engaged by the free end of a spring pawl or detent 12 secured to the side of the tubular section 8 and extending through a lateral slot or opening therein into engagement with the rod 9. This permits the rod to be withdrawn or extended to any desired degree in which case the ratchet teeth 11 will ride freely beneath the spring detent 12. However, when it is desired to return the rod 9, such rod is given a partial rotation which moves the ratchet teeth 11 transversely out of registry with the detent 12 which then rides upon a smooth, un-notched portion of the rod, permitting the rod to be retracted without interference of the detent with the ratchet teeth.

If desired, the teeth 11 instead of being inclined ratchet teeth, may be formed by kerfs or notches in the side of the rod 9 having perpendicular sides within which the spring detent 12 will engage to prevent the movement of the rod in either direction. In such case, the rod is disconnected for adjustment to extended position as well as retraction by a partial rotation whereby the notched area is shifted transversely out of registry with the detent, and when the proper adjusted position has been reached, it is reengaged by a return rotation, whereby such selected notch is brought into registry with the detent 12 for engagement of the detent therein. Other forms of clutch or locking means may be employed in lieu of that described.

Concentric with the pivotal center 7 of the arm 4, is a notched segment 13 having a series of ratchet teeth 14 to be engaged by a spring detent or pawl 15, mounted within the arm 4. Such locking detent 15 is slidingly mounted in slots 16 in the parallel spaced bars forming the arm 4, and is actuated into engagement with the ratchet segment by an helical spring 17 abutting at one end upon such detent pawl, and at its opposite end upon one of the intermediate spacers 5. The ratchet teeth 14 are turned in such position that the detent pawls 15 will ride freely over such teeth as the toggle jack is adjusted toward its aligned position. However the engagement of such detent pawl with the ratchet teeth will effectively lock the arms of the toggle against return movement.

Thus when the jack is initially positioned, as shown in Fig. 1, with the free end of the arm 4 abutting upon the seat 1 of the vehicle and the head 10 of the extension rod 9 abutting upon the pedal 3, and the tubular handle portion 8 is then depressed causing the toggle to assume a more nearly aligned position, as shown by dotted lines in Fig. 1, considerable pressure is exerted upon the pedal 3, which is thereby depressed, and inasmuch as the detent pawl 15 by its engagement with the ratchet teeth 14 locks the jack in such operated position, the pedal is held depressed.

Inasmuch as the elongation of the jack is much greater for each degree of deflection when the toggle arms are in an angular position, and such elongation decreasing as they approach alignment, the ratchet teeth 14 may be made of gradually increasing proportion, as indicated in Fig. 2. By this means, the degree of elongation for each ratchet tooth traversed by the detent 15 is more nearly equalized. That is to say, in the movement necessary to move the detent 15 from one tooth to the other at the initial end of the ratchet segment, an elongating movement of the toggle will be effected to a degree substantially equivalent to that achieved by a movement from one to the other of the larger teeth at the final terminal of the ratchet segment.

Inasmuch as the jack must be repeatedly adjusted to the same degree or operated to effect a like depression of the pedal repeatedly when adjusting fourwheel brakes, it is desirable, though not necessary, to provide an adjustable stop which will positively limit

the adjustment of the toggle arm when a predetermined degree of adjustment has been reached. In Fig. 3 there is shown a segment 18 pivoted on the center 7 concentric with the arm 4 and having a lug 19 overhanging such arm and forming a stop therefor. The stop segment 18 contains a concentric slot 20 in which engages a clamp screw 21. Normally this segment is free to move to and fro with the arm 4. However when the toggle jack has been adjusted to its desired position, the clamp screw 21 is tightened thereby locking the segment 18 in its adjusted position corresponding to the position of the arm 4. Thereafter in adjusting the jack for the remaining wheel brake, the jack is merely depressed until its aligning movement is arrested by the engagement of the arm with the stop lug 19. An ordinary adjustable stop screw may be substituted for the swinging segment.

There is also shown in Figs. 3 and 4, a modification of the locking clutch for the extensible rod 9 of the second toggle member. In this construction, the head of the member 8 to which the arm 4 is pivoted, is provided with a T-shaped lug 22 which forms a fulcrum for a bifurcated locking plate 23. This locking plate 23 has therein a hole slightly larger than the rod 9 through which the rod extends. At its lower end, the locking plate is subjected to the pressure of a spring 25 seated within the head of the member 8 and bearing upon the bifurcated extremity of the plate 23. The spring tension upon the plate 23 causes the margins of the hole 24 therein to bind upon the rod 9 and thereby prevent retractive movement of the rod into the tubular portion 8. However the rod is free to be withdrawn from the portion 8 past the plate 23 which offers no resistance to movement in the outward direction.

In lieu of pivoting the arm 4 to the forward end of the section 8, it may be pivotally attached to the opposite end of such member as shown in Fig. 5. Likewise, Fig. 5 shows a reversal of the mounting of the ratchet segment and detent pawl. In the form of device shown in Fig. 5, the ratchet segment 13 is carried by the arm 4, while the detent pawl 15 is spring mounted in a lug 27 projecting from the section 8. The operation and result, however, are the same as before described.

In Figs. 7 and 8 there is shown a further modification wherein a detent plate 25, having an opening therein through which extends the toothed rod 9, is pivoted at 26 to the main member 8. The plate 25 is oscillated transversely of the rod 9 by a spring plunger 28 engaging the plate 25 beyond its pivotal portion. The margin of the opening in the detent plate is projected into engagement with the ratchet teeth by the reaction of such spring plunger.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect and the invention is, therefore, claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described our invention, we claim:—

1. In a spacer jack of the character described, a pair of arms interpivoted for unison oscillation and forming a toggle joint, one of said arms comprising two telescopically adjustable sections, a series of ratchet teeth carried by one section of said arm and a detent pawl carried by the other section of the arm and engaging with the ratchet teeth to normally resist retraction of the telescopic arm but permitting free extension thereof, and a series of ratchet teeth carried by one of said interpivoted arms and a detent pawl carried by the other arm and engaging with the ratchet teeth permitting free adjustment of the arms toward aligned position, but normally resisting relative adjustment in reverse direction.

2. In a spacer jack of the character described, two interpivoted arms forming a toggle joint, one of the arms comprising two longitudinally adjustable sections also capable of relative transverse motion, clutch means for maintaining said sections in various positions of longitudinal adjustment upon relative transverse motion of the sections, and clutch means operable independently of said first mentioned clutch means for maintaining said arms in various positions of relative angular adjustment.

3. In a spacer jack or the like, a pair of arms interpivoted for unison oscillation and forming a toggle joint, a ratchet head carried by one arm and a detent carried by the other arm for holding the arms in various positions of angular adjustment, the ratchet teeth of said ratchet head being of progressively varying size.

4. A spacer jack comprising a pair of interpivoted arms forming a toggle, and a stop member adjustable independently of the arms for limiting their approach toward aligned position.

5. A spacer jack of the type described, comprising a pair of arms interpivoted for unison oscillation and forming a toggle joint, one of the arms being longitudinally extensible and contractible, and means for locking the arms in different positions of relative angular adjustment.

6. A spacer jack of the character described comprising a pair of arms interpivoted for unison oscillation and forming a toggle joint, a ratchet head carried by one of the arms, and a detent pawl carried by the other arm and engaging the ratchet head for retaining the arms in their relatively adjusted position.

7. A spacer jack of the character described, a pair of arms interpivoted for unison oscillation and forming a toggle joint, one of the arms being extensible and contractible, a ratchet segment carried by one of the arms and a pawl carried by the other arm progressively engaging the ratchet segment as the arms are adjusted toward aligned position and operating to hold the arms in any intermediate position of adjustment against return movement.

8. A spacer jack of the character described comprising a pair of arms interpivoted for unison oscillation and forming a toggle joint, one of said arms comprising two longitudinally adjustable sections whereby the arm may be lengthened and shortened, a pawl and ratchet connection for maintaining the sections of the arm in different intermediate positions of relative adjustment, and means for interlocking the pivotally connected arms in different intermediate positions of adjustment.

9. A spacer jack of the character described comprising a pair of arms interpivoted for unison oscillation and forming a toggle joint, a longitudinally adjustable extension for one of said arms, and clutch means permitting the extension to be freely adjusted to extend said arm but normally resisting return movement thereof, and clutch means permitting relative adjustment of the interpivoted arms toward aligned position but normally resisting return movement thereof.

10. A spacer jack of the character described comprising a pair of arms interpivoted for unison oscillation and clutch means for maintaining the arms in various positions of relatively angular adjustment permitting free movement of said arms toward aligned position but normally resisting reverse adjustment.

11. In a spacer jack or the like, a pair of interpivoted arms forming a toggle joint, one of said arms extending in reverse direction beyond the pivotal joint but in alignment with the effective portion of the arm to afford a handle for adjustment of said arms, and means for maintaining the arms in different intermediate positions of relative adjustment.

12. In a spacer jack or the like, a pair of interpivoted arms, one of the arms being pivoted to the other at a midlength point, whereby one portion of such arm is effective for toggle action, while the portion of the arm beyond the pivotal point and overhanging the other arm affords a handle portion of adjustment of the toggle, and locking means permitting the approach of the arms toward alignment, but preventing retrograde movement.

13. In a spacer jack or the like, a tubular handle section, an arm pivotally connected thereto adjacent to one end, a rod telescopically adjustable within the handle section to extend a greater or less distance beyond the pivotal connection and forming with the said arm a toggle joint, means for locking the rod relative to the handle in different extended positions, and means for locking the handle and arm in their pivotally adjustable position relative to each other.

In testimony whereof, we have hereunto set our hands this 15th day of January A. D. 1929.

LINUS E. RUSSELL, JR.
GEORGE E. PETERS.