Oct. 16, 1923. 1,471,066

E. T. RUSHTON ET AL

TOOL FOR EXPANDING AND CONTRACTING SPLIT WHEEL RIMS

Filed June 10, 1919 2 Sheets-Sheet 1

Fig. 1.

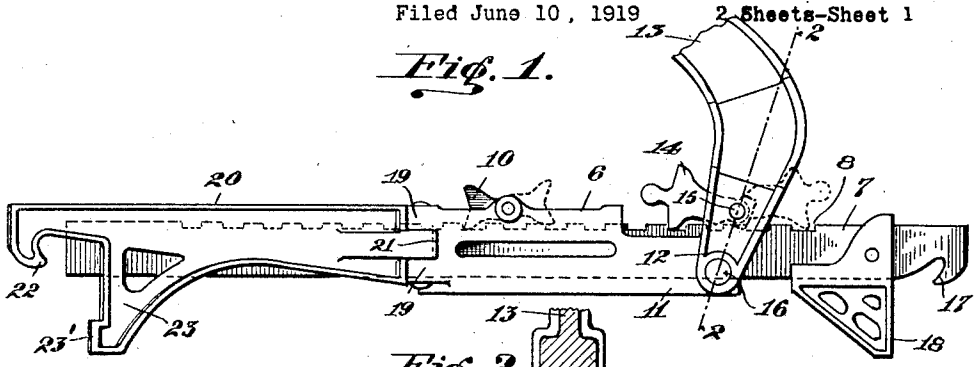


Fig. 2.

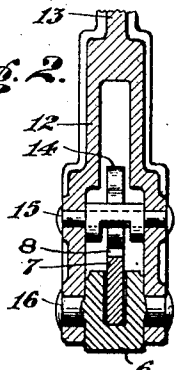


Fig. 3.

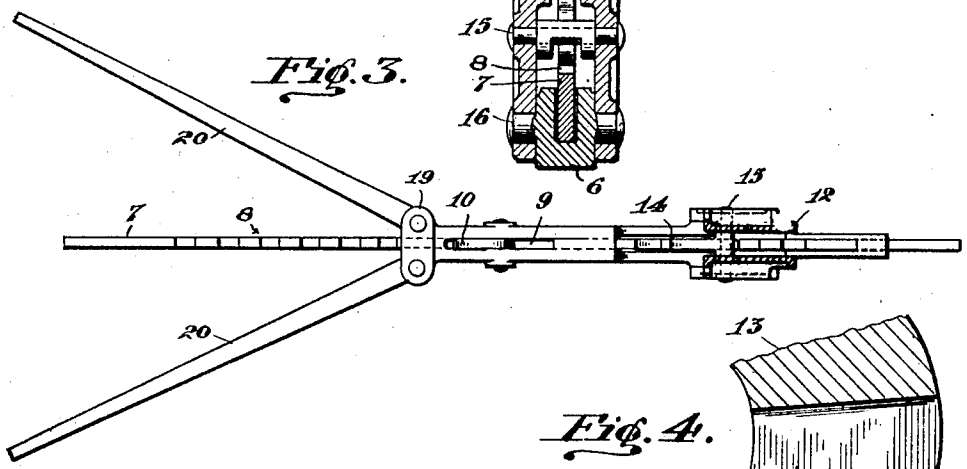
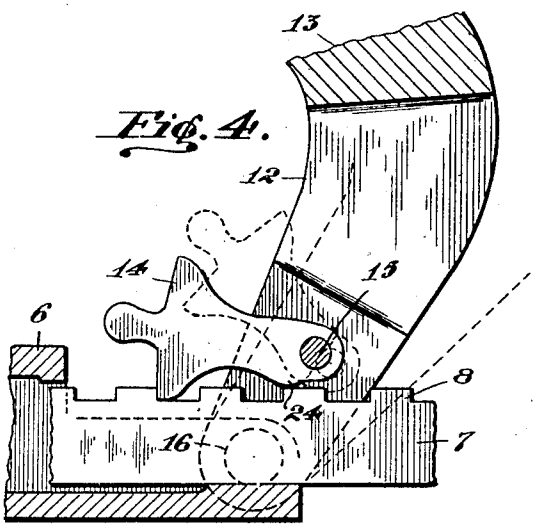


Fig. 4.



INVENTORS:

E. T. Rushton

Roni L. Burns

Oct. 16, 1923. 1,471,066

E. T. RUSHTON ET AL

TOOL FOR EXPANDING AND CONTRACTING SPLIT WHEEL RIMS

Filed June 10, 1919 2 Sheets-Sheet 2

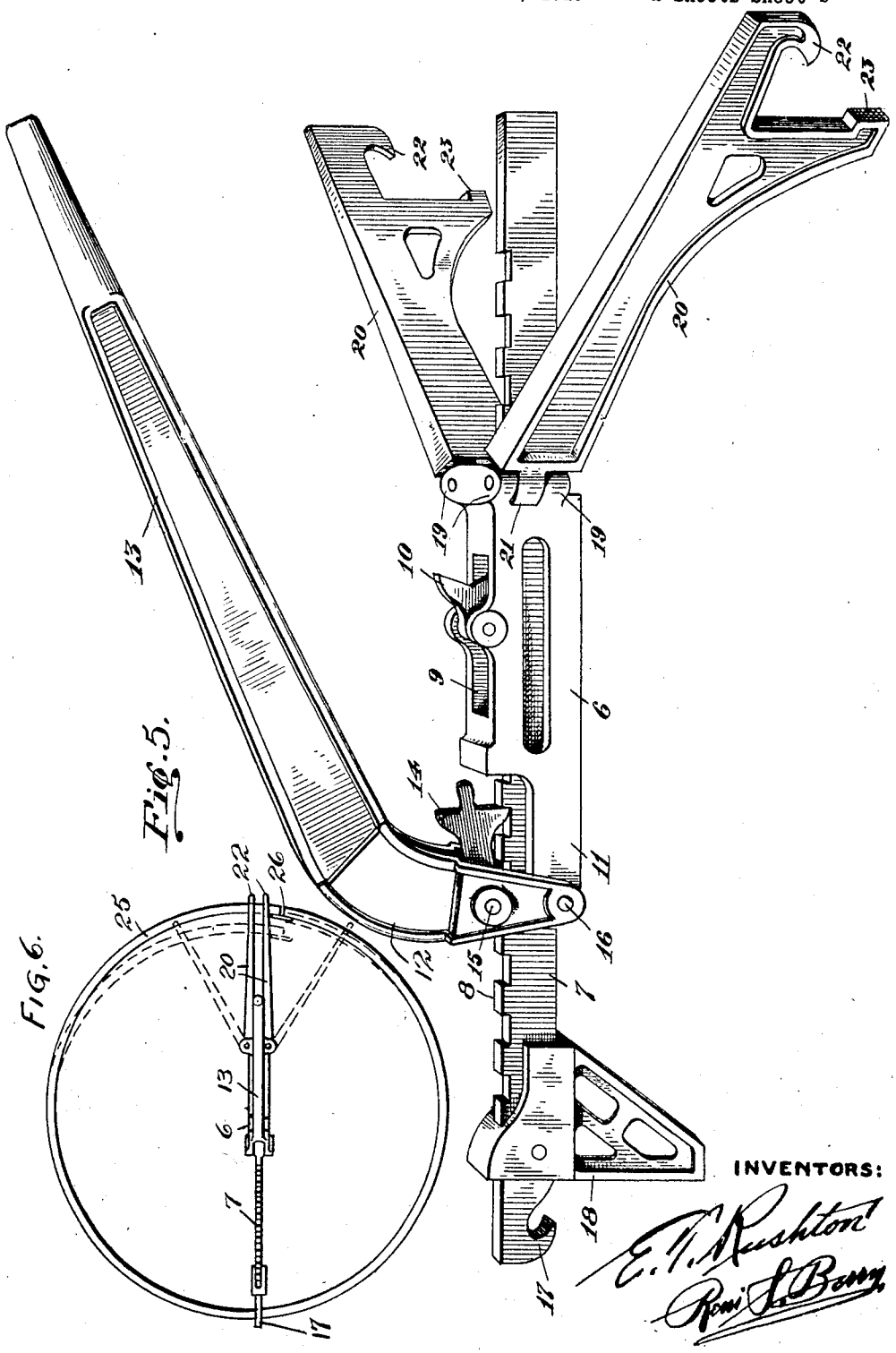


Fig. 5.

Fig. 6.

INVENTORS:

E. T. Rushton

Roni L. Bowy

Patented Oct. 16, 1923. 1,471,066

UNITED STATES PATENT OFFICE.

ELMER T. RUSHTON AND RENI S. BERRY, OF LOS ANGELES, CALIFORNIA, ASSIGNORS TO HERCULES PRODUCTS COMPANY, OF ST. JOSEPH, MICHIGAN, A CORPORATION OF MICHIGAN.

TOOL FOR EXPANDING AND CONTRACTING SPLIT WHEEL RIMS.

Application filed June 10, 1919. Serial No. 303,152.

To all whom it may concern:

Be it known that we, ELMER T. RUSHTON and RENI S. BERRY, citizens of the United States, residing in the city of Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Tools for Expanding and Contracting Split Wheel Rims, of which the following is a specification.

This invention relates to a tool for expanding and contracting split wheel rims of the type now commonly employed on the wheels of autovehicles.

It is the object of this invention to provide a tool of the above character, so constructed that a single tool may be readily adjusted to engage split wheel rims of various sizes and which when engaged with the rim may be employed both in contracting and expanding the rim without disengagement therefrom.

Another object is to provide a combined wheel-rim expanding and contracting tool embodying an operating means by which the high resistance to expanding and contracting movement of stiff wheel-rims may be readily overcome and the rim shrunk or distended with comparative ease so as to facilitate the application and removal of tires.

Another object is to provide means whereby the rim may be held in various states of contraction or expansion and readily carried about when so held and which when the rim is contracted will permit the rim being lifted in or out of a tire.

A further object is to provide a tool of the above type embodying relatively reciprocal expanding and contracting members adapted to be retracted step by step in contracting the rim in opposition to the tension thereof.

Other objects will appear hereinafter:

The invention is illustrated in the accompanying drawings showing the preferred embodiment thereof, in which;

Figure 1 is a view of the tool as seen in side elevation, a portion of the handle being broken away.

Figure 2 is a detail in section and elevation as seen on the line of 2—2 of Figure 1.

Figure 3 is a plan view of the same.

Figure 4 is a detail and side elevation with parts broken away illustrating the construction and operation of the double acting operating dog.

Figure 5 is a perspective view of the tool.

Figure 6 is a plan view illustrating the manner of applying the tool to a wheel rim in breaking the rim and showing in dotted lines the position of the arms in shrinking or expanding the rim.

More specifically 6 indicates a sleeve of rectangular cross section having a longitudinal rectangular bore to slidably receive and form a guide for a flat bar 7 which projects through the sleeve and extends beyond the ends thereof.

The upper edge of the bar, is formed with square ratchet teeth 8, and mounted on the sleeve 6, and extending through a slot 9, in the upper wall thereof as a double acting pawl 10 adapted to engage the ratchet teeth to hold the bar against movement in either direction relative to the sleeve as occasion may require.

An extension 11 is formed one end of the sleeve projecting beneath the bar 7, and pivotally connected thereto is a yoke 12, which is disposed astride the sleeve and bar and has a bent handle 13, formed thereon.

A double-acting dog 14, is pivoted at 15, between the side members of the yoke and is adapted to be swung upwardly through the yoke and to extend either forwadly or rearwardly of the lever (formed by the yoke and handle) into engagement with the bar whereby the latter may be moved longitudinally in either direction relative to the sleeve on rocking the lever.

The pivotal point 15, of the dog is disposed as close to the upper edge of the bar as is possible and yet permit movement of the lever a sufficient distance to advance the bar a distance substantially corresponding to, or slightly greater than the spacing of the ratchet teeth which in practice has been found to be most desirable at about one inch.

The pivotal mounting 16 of the lever is preferably disposed at about one and three eighths inches from the pivot 15 which spacing, with a handle length of about eighteen inches provides sufficient leverage

to adapt the tool for use in expanding and contracting large and heavy types of wheel rims with ease.

The end of the bar 7, adjacent the lever is provided with a hook 17, adapted to extend over and engage the edge of a wheel rim, and is provided with a shoulder 18 spaced from the hook and adapted to extend interiorly of the wheel rim to engage the latter when effecting expansion thereof.

Formed on the end of the sleeve 6 opposite the mounting of the lever and projecting from each side thereof is a pair of spaced bosses 19, forming yokes, on which a pair of arms 20 are pivotally mounted; the arms being adapted to be spread apart as shown in Figure 3, or extended close together as shown in Figure 6.

The outer ends of the arms are formed with hooks 22 adapted to extend over and engage the edge of a wheel rim and formed on each arm is a shoulder 23 spaced from the hook and adapted to extend interiorly of the rim and to co-operate with the shoulder 18 in expanding the rim.

An important feature of this invention resides in a construction whereby the dog 14 may be automatically moved out of engagement with the teeth or notches on the bar which is here shown as consisting of a hump 24 formed on the under side of the dog adjacent to its pivot-pin 15 and forward of the vertical center of the pivot-pin. This hump is adapted to be moved into contact with the upper edge of the bar so that on continuing movement of the lever after the hump is brought into contact with the bar an upward pressure will be exerted on the dog to lift the latter out of engagement with the bar as indicated in dotted lines in Fig. 4.

In the operation of the invention, the tool is applied to a split rim with the hook 17 engaging the rim 25 at a point approximately diametrically opposite the split 26 in the rim and the hooks 22 on the arms 20 are engaged with the rim adjacent to the split portion thereof. In "breaking" the rim both the arms 20 are engaged with the rim on one side of the split 26 as shown in Figure 6 whereupon the dog 14 and pawl 10 being positioned to extend on the side of the lever toward the arms 20, as shown in Fig. 1, the lever is then retracted to engage the dog with one of the teeth on the bar. Downward pressure on the lever will then act to advance the bar and sleeve relative to each other thus exerting an inward pull on the rim to "break" same. One of the hooks is then shifted to position a hook on each side of the split as shown in dotted lines in Figure 6; the arms then diverging as shown in Fig. 3. The lever is then retracted and the dog engaged with another tooth and again depressed to operate as above in shrinking or contracting the rim. The pawl 10 riding into engagement with the teeth holds the rim against expansion and permits a series of the contracting operations being employed to shrink the rim step by step. Usually two or three bites are sufficient to shrink the rim to such extent that it may be lifted clear of or inserted in a tire. When it is desired to release the rim and permit it to expand to normal the lever is pressed downwardly to advance the bar such distance that the pawl 10 may be disengaged from the bar and reversed in position as indicated in dotted lines in Fig. 1. The lever is then retracted which permits the rim to expand and in so doing exert opposite pulls on the bar and sleeve. The lever is retracted such distance as to force the dog out of engagement with the bar as before described; the upward pull on the lever adjacent to the end of its stroke exerting a downward pressure on the pivoted portion of the dog when the hump seats on the upper edge of the bar. The hump will then serve as a fulcrum on which the dog will be rocked lever fashion and drawn out of engagement with the bar. The rim will then be permitted to expand to its normal position and in so doing will carry the bar and sleeve therewith. By this means the rim may be restored to normal by a single retracted movement of the operating lever, irrespective of the number of steps employed in contracting the rim.

It frequently occurs on the withdrawal of the dog from engagement with the bar as above described that sufficient impulse will be imparted to the dog as to cause it to swing upward and over so as to extend from the opposite side of the lever as indicated in dotted lines in Fig. 1, so as to position it in readiness for the next operation in expanding the rim. However if this reversal of the dog be not automatically effected it may be readily accomplished manually. In expanding the rim the dog being reversed the operating lever is lowered to bring the dog into engagement with a tooth so that on upward movement of the lever the sleeve and bar will be moved outwardly causing the shoulders 18 and 23 to bear against the inner portion of the rim in opposite direction to expand the latter. Ordinarily one operation of the lever will advance the bar and sleeve relative to each other a sufficient distance to fully expand the rim but in the event several steps are necessary the reversed pawl 10 will engage the bar to permit a number of bites being taken.

From the foregoing it will be seen that the three operations required in detaching and connecting a rim and tire may be performed by the use of this tool without disengaging the tool from the rim and that by extending or retracting the bar and sleeve relative to each other the tool may be adjusted to fit wheel rims of various sizes.

Whilst the invention has been illustrated and described in its specific embodiment various changes in the details of construction and various modifications may be made without departing from the spirit and scope of the invention.

We claim:

1. In a tool for expanding and contracting split wheel rims, a sleeve, a toothed bar slidable therein, a pawl carried by said sleeve engageable with the teeth on the bar, wheel rim engaging means on said sleeve and bar, a lever pivoted on said sleeve, and a reversible dog carried by said lever adapted to be operatively engaged directly with the teeth on the bar from opposite sides of the lever, whereby on operation of the lever the bar may be advanced step by step in either direction.

2. In a tool for expanding and contracting split wheel rims, a sleeve, a bar slidable therein, rectangular teeth on said bar, a pawl carried by said sleeve engageable with the teeth on the bar, means on said bar and sleeve for engaging both the inner and the outer peripheries of a wheel rim, a lever pivoted on said sleeve, and a reversible dog carried by said lever and operatively engageable directly with the teeth on the bar from either side of the lever, whereby on operation of the lever the bar may be advanced step by step in either direction.

3. In a tool for expanding and contracting split wheel rims, a pair of members adapted to be extended or retracted relative to each other, a pair of arms pivotally carried on one of said members, a hook on each of said arms and on the other member adapted to project over the edge of and engage the outer periphery of a wheel rim to effect a three point engagement therewith, a shoulder on each of said arms and said other member spaced from the hook thereon to project interiorly of a wheel rim and effect a three point engagement therewith when the members are extended relative to each other in expanding the rim, a lever pivoted on one of said members, a dog on said lever engageable with the other member whereby said members may be extended or retracted step by step, and a pawl cooperating between said members adapted to hold them against movement relative to each other.

4. A tool for expanding and contracting split wheel rims comprising a sleeve, a flat bar, slidable longitudinally in said sleeve, said bar formed with square rack teeth on one edge thereof, a lever having a yoke extending astride said sleeve and bar pivoted on the sleeve, a reversible dog pivoted in said yoke above the rack teeth and adapted to be positioned to extend from either of opposite sides of said lever into direct operative engagement with the rack teeth whereby on operation of the lever the bar may be advanced step by step in either direction, a pawl on the sleeve engageable with the rack teeth on the bar, and wheel rim engaging means on said sleeve and bar whereby either a push or pull may be effected on said rim on operation of the lever.

ELMER T. RUSHTON.
RENI S. BERRY.