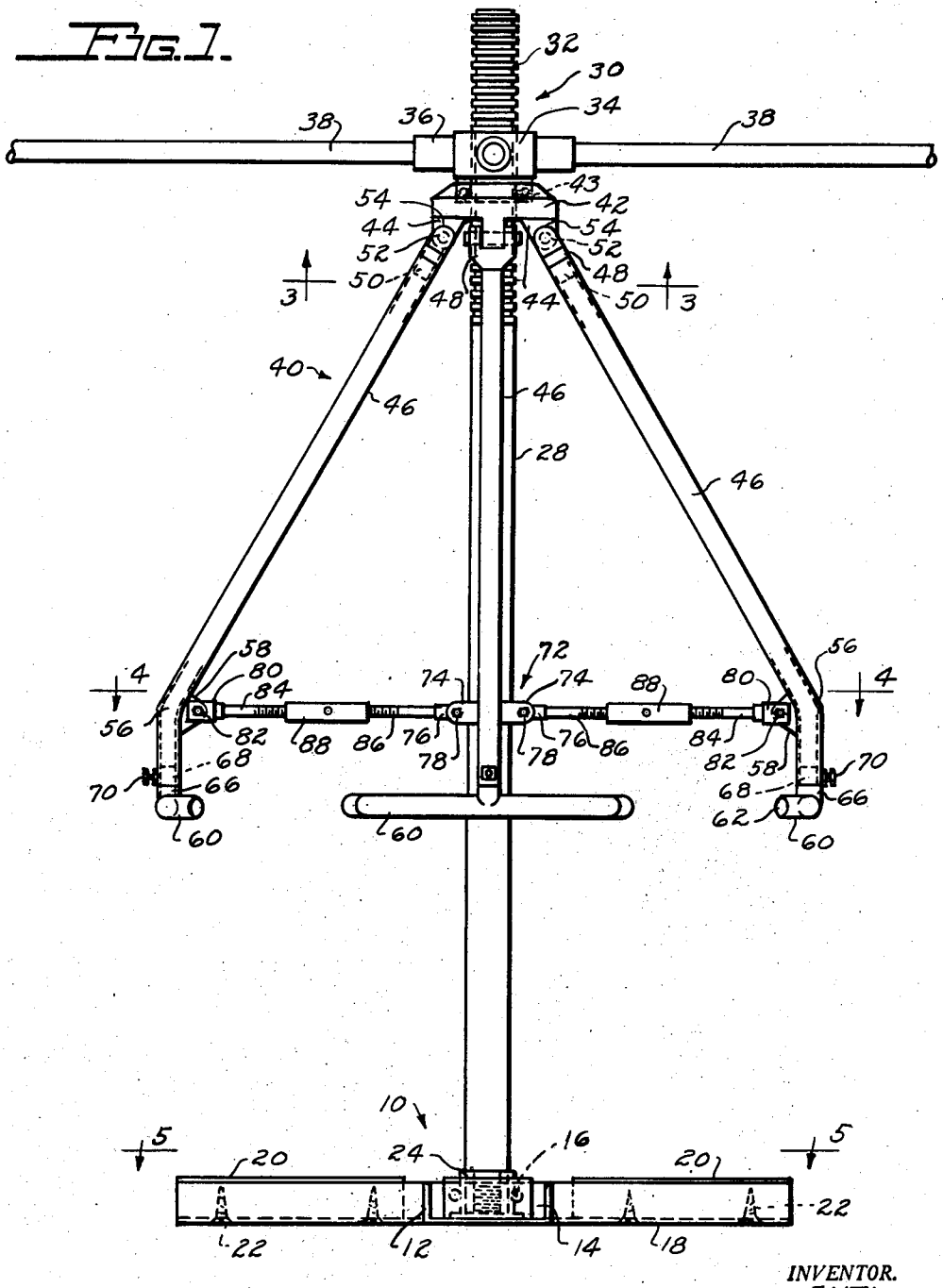
May 17, 1949. F. PIACENTI 2,470,107

COLLAPSIBLE TIRE REMOVER

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Fig. 1.



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FIG. 2.

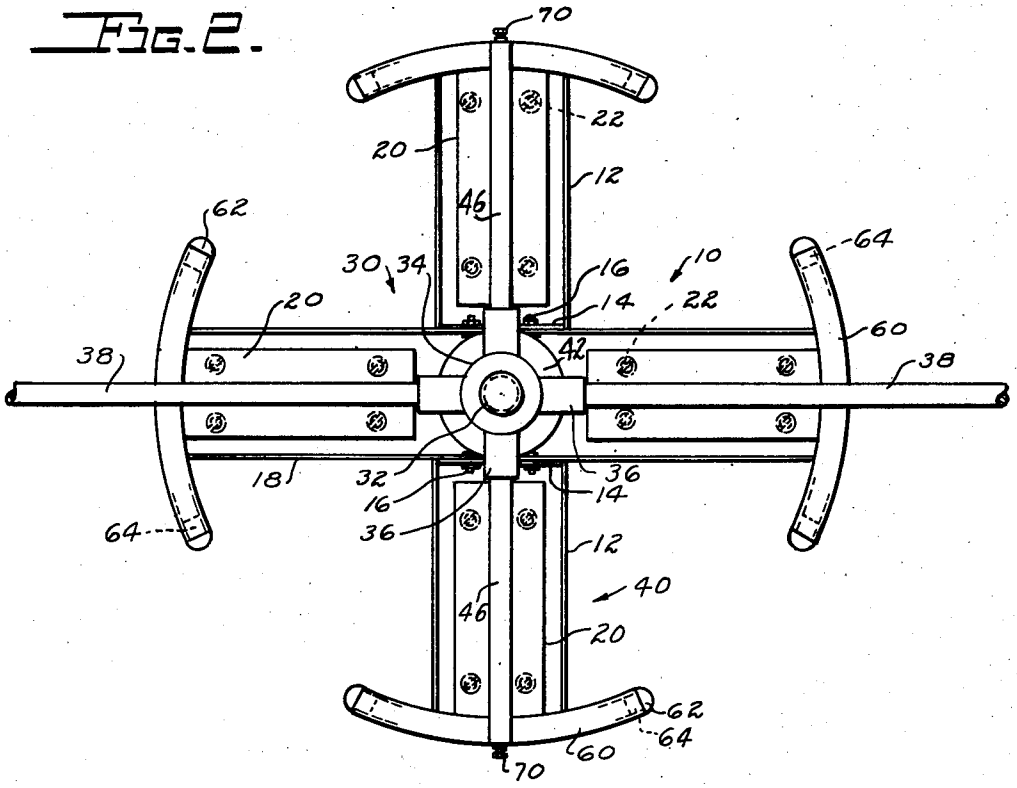
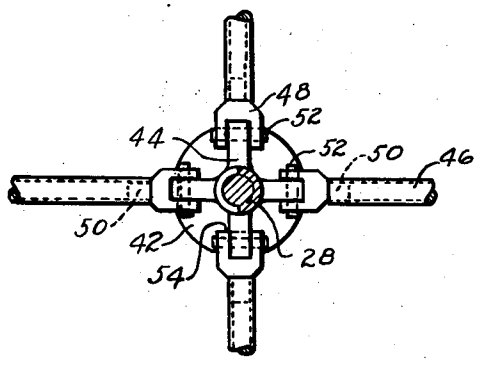


FIG. 3.



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FIG. 4.

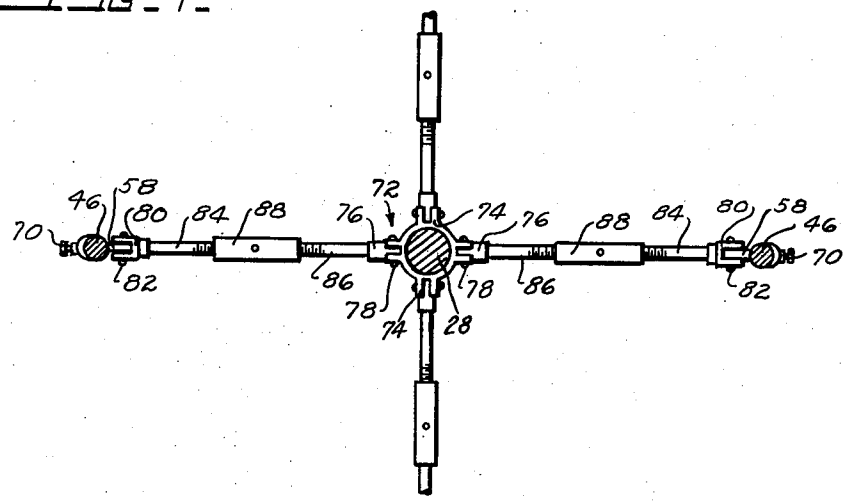
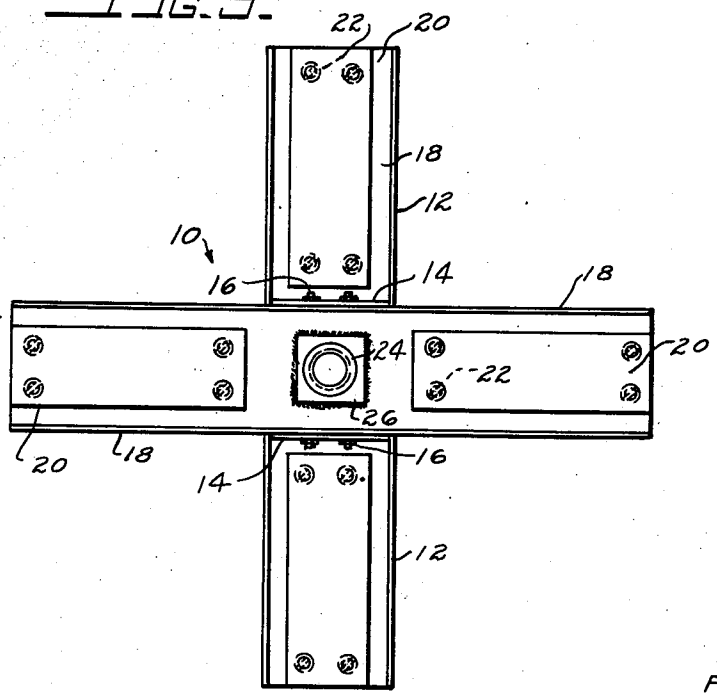


FIG. 5.



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UNITED STATES PATENT OFFICE

2,470,107

COLLAPSIBLE TIRE REMOVER

Frank Piacenti, New York, N. Y.

Application September 18, 1945, Serial No. 617,160

1 Claim. (Cl. 157—1.2)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without payment to me of any royalty thereon.

This invention relates to a device for removing pneumatic tires from the rims and is particularly adapted for use by mobile servicing units.

An object of the invention is to provide a device of this character which is made principally of tubing and other light sections and so constructed that it may be quickly assembled for use or disassembled into its individual parts and packed in a box for transportation.

Another object is to provide a device of this kind having both axial and diametral adjustments whereby it is adapted for tires and rims of various kinds and sizes.

Other objects and advantages will become evident as the invention is further described with reference to the drawing wherein:

Fig. 1 is an elevation of the device as seen when completely assembled.

Fig. 2 is a top plan view of the device.

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1.

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 1.

Like reference characters refer to like parts throughout the several views.

Referring now to the drawings, a base 10 is made up of lengths of channel beam which are placed with the open side upward, the shorter pieces of channel 12 each having an end piece 14 welded at the inner ends, whereby they may be fastened by bolts 16 passing through both the end pieces 14 and the sides of the longer piece 18. Lengths of two-by-four lumber 20 are fastened to the channel pieces 12 and 18 by screws 22 the thickness of the wood being slightly greater than the depth of the channel beam, whereby the wood extends above the edges to provide a greater surface upon which the work may rest. An internally threaded flange hub 24 is secured in the bottom of the longer channel piece 18 by welding its flange 26 to the bottom of the channel. Obviously the entire base assembly 10 may be disassembled and packed into a relatively small space by simply removing four bolts 16.

The pressure applying assembly 30 consists of a column 28 which is threaded at the lower end to fit snugly into the internal threads of the hub 24 of the base. The upper end of the column 28 is externally threaded at 32 for the internally

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threaded pressure applying nut 34. Nut 34 is provided with four hollow spokes 36 which are drilled to receive the tubular handles 38, two only of which are provided. The handles 38 are readily removable from the remainder of the pressure applying assembly, whereby the parts may be packed in a relatively short space.

The pressure distributing assembly 40 comprises a thrust bearing retainer 42 bored to receive a thrust bearing 43 and having four depending ears 44 to which the tubular leg members 46 are hinged. Clevises 48 have shanks 50 secured in the upper ends of the leg members. Pins 52 hinge the upper bifurcated ends 54 of the clevises to the ears 44 of the bearing retainer 42.

The lower ends of the tubular leg members 46 are bent at 56, the inside of the bends being provided with ears 58 which are preferably welded to the leg members. Shoes 60 are preferably made of tubing bent to arcuate form, the ends being closed by hemispherical parts 62 which have shanks 64 which may be press fitted into the ends of the shoes. Knee members 66 have the lower ends fitted and welded to the arcuate shoes and are provided at the upper ends with shanks 68 which extend into the lower ends of the tubular legs and are removably fastened therein by setscrews 70.

A brace support 72 is provided for attaching braces for maintaining the leg members 46 in the desired position. Brace support 72 is bored to fit slidably over the column 28 and has four pairs of ears 74 between each of which a joint 76 is held by a bolt 78. Clevises 80 straddle the ears 58 on the legs 46 and are secured thereto by bolts 82. Right and left hand threaded studs 84 and 86 have the one end secured in clevises 80 and joints 76, the other ends of the studs being threaded for the turnbuckles 88, whereby the spread of the legs 46 is adjustable. By loosening the setscrews 70 and removing the shoes 60, the legs may be folded in, umbrella fashion without further disassembly when transportation of the device is to be effected.

The operation of the device is as follows:

The base assembly 10 is first set up by bolting together the long and short sections 18 and 12 by means of the bolts 16. A tire and rim are then laid on the base as nearly concentric with the hub 24 of the base as may be gauged by eyesight. The lower threaded end of the column 28 may then be screwed into the threaded hub 24 of the base assembly.

The pressure distributing assembly 40 is next assembled substantially as shown in the drawing

and dropped down over the column 28 until the arcuate shoes 60 rest on the tire. The turnbuckles 58 may preferably be adjusted so that the shoes 60 just miss the rim in passing over it.

The pressure applying assembly 30 may now be screwed over the threaded upper end 32 of the column 28 until the lower end of the nut 34 rests on the antifriction bearing 43 within the retainer 42. Further screwing down of the nut 34 by means of the handles 38 will break the bead loose from the rim. Repeat the operation on the other side of the tire. This procedure is applicable to all drop center tires and rims.

For wheels where one bead engaging flange is integral with the hub and the other is detachable therefrom the procedure is preferably as follows:

Place the wheel on the base with the integral flange upward and brake the bead therefrom in the manner explained with reference to drop-center rims. Remove the pressure applying assembly 30 and the pressure distributing assembly 40 and turn the tire and hub over so that the detachable flange is upward. Lift the tire and detachable flange until the lower edge of the detachable flange is off and slightly above the top edge of the hub. Place several lengths of bar stock across the top edge of the hub and under the lower edge of the detachable flange, then break the bead loose from the detachable flange in the usual manner. The bar stock will prevent the detachable flange falling back over the hub when the bead is broken loose from the detachable flange.

For tires still smaller than those above mentioned a short non-adjustable link may replace the turnbuckle assembly, or a length of cable having any suitable means of connecting the ends together may surround the legs 46 below the bend and above the set screws 70 to prevent the legs spreading when a bead is being broken loose.

Having thus described an embodiment of my invention, I claim:

A foldable portable apparatus for breaking the beads of pneumatic tires loose from their rims, which comprises, in combination, a four-legged base for supporting the underside of the tire and rim assembly, two opposite legs being integral and the other two being detachable for laying alongside the first in transportation, a removable column extending upwardly from said base, pressure distributing means which consists of a thrust bearing retainer slidable vertically on said column, a thrust bearing in said retainer, circumferentially spaced hinge means carried by said thrust bearing retainer, a series of legs having the upper ends hinged to said hinge means and the lower ends swingable toward and away from said column, arcuate shoes removably secured to the lower ends of said legs, a brace support in the form of a collar slidable vertically on said column, circumferentially spaced hinge means on said brace support, hinge means on said legs near the lower end, braces for connecting the hinge means of the brace support to the hinge means at the lower ends of said legs, whereby said apparatus may be folded umbrella fashion, turnbuckles in said braces, whereby said swingable legs and the arcuate shoes may be adjusted radially so as to just miss the rim and engage the side wall of the tire, a pressure applying assembly which consists of a pressure applying nut threadedly engaging the upper end of said column above said thrust bearing retainer, and removable handles for rotating said nut.

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