Aug. 15, 1933. M. K. McCOSH 1,922,554

LIFTING DEVICE

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Fig. 1.

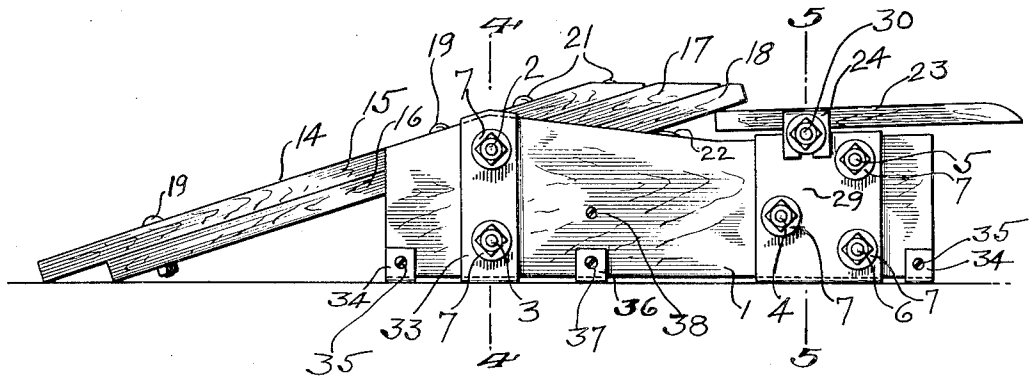


Fig. 2.

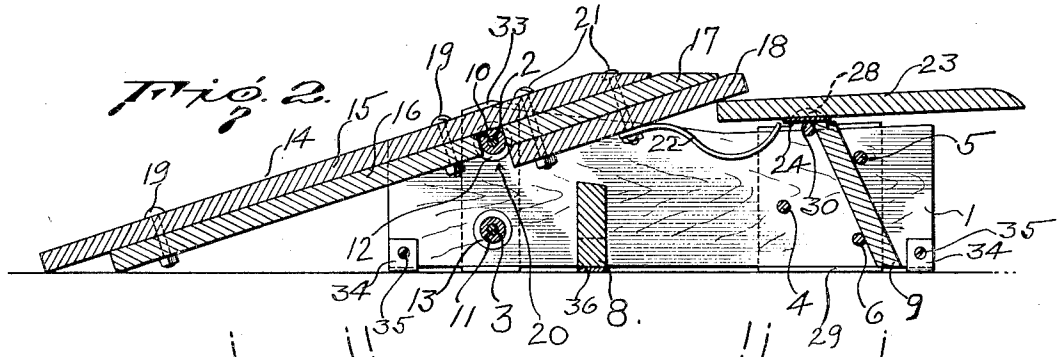
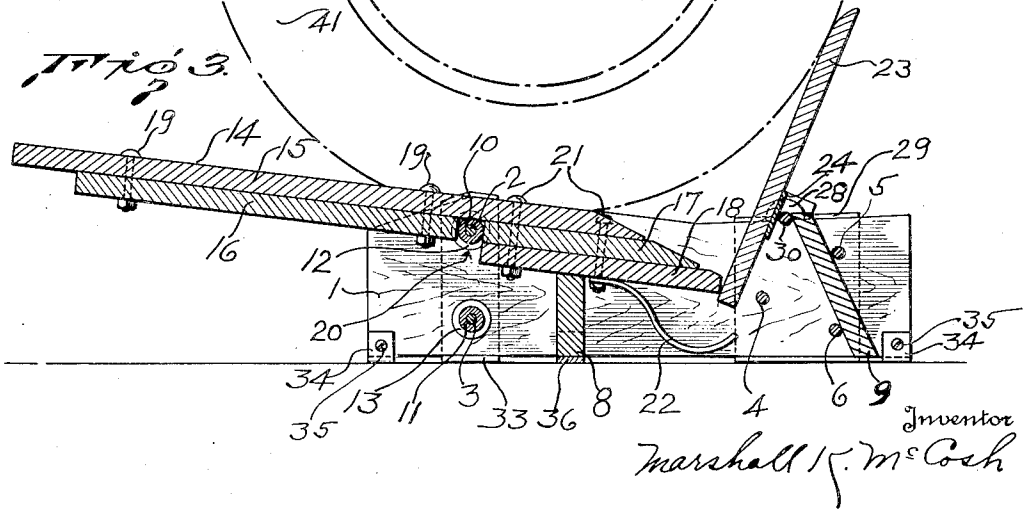


Fig. 3.



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Fig. 4.

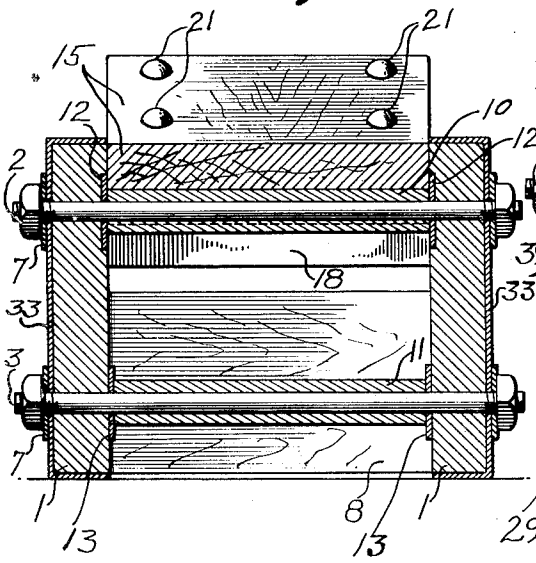


Fig. 5.

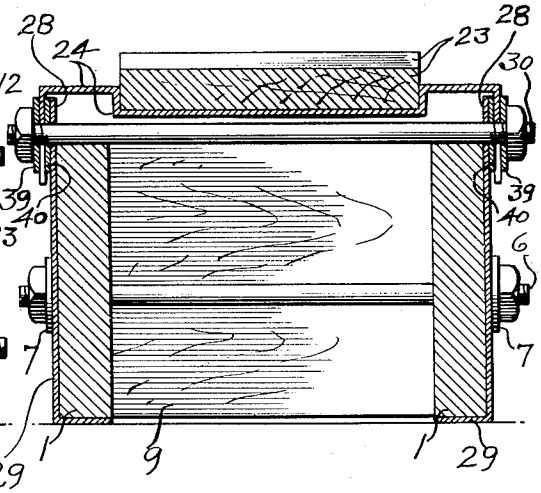


Fig. 6.

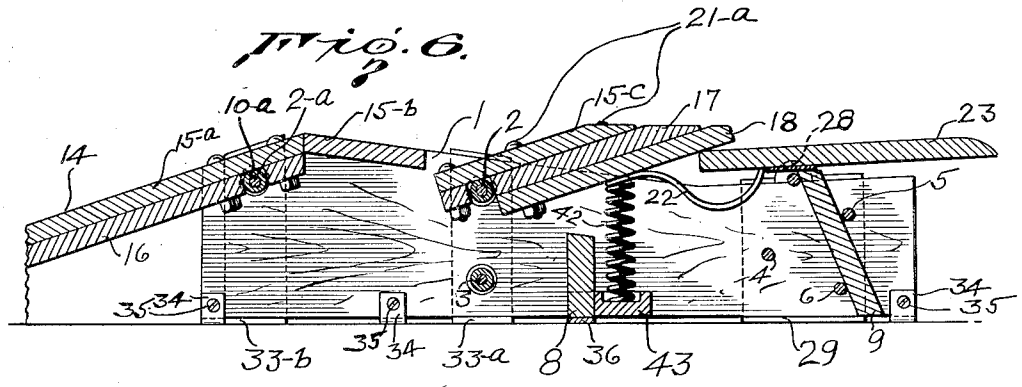
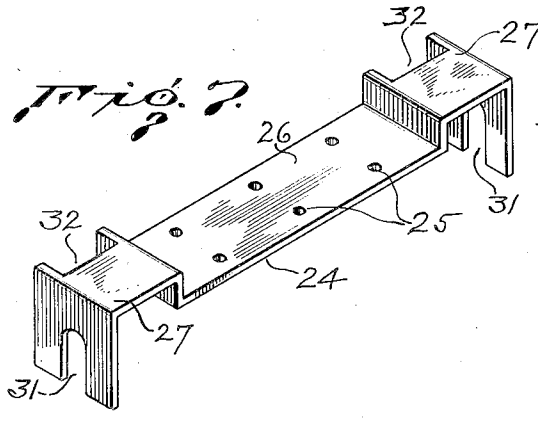


Fig. 7.



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Fig. 12.

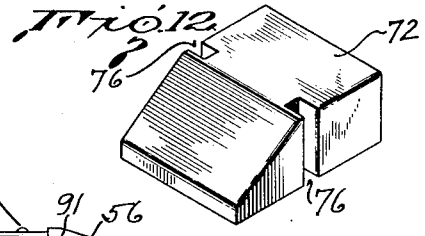


Fig. 8.

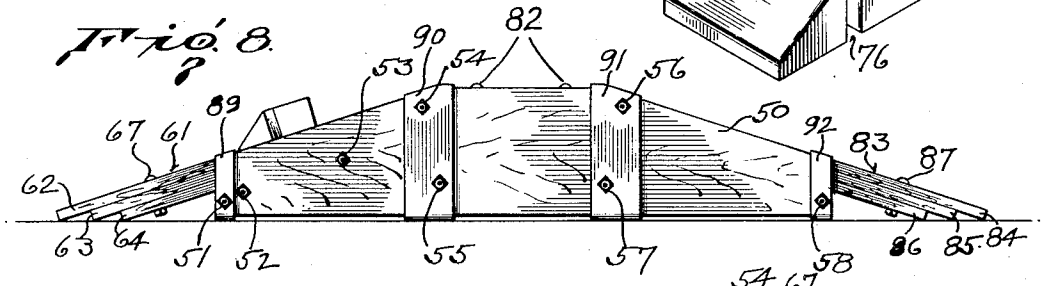


Fig. 9.

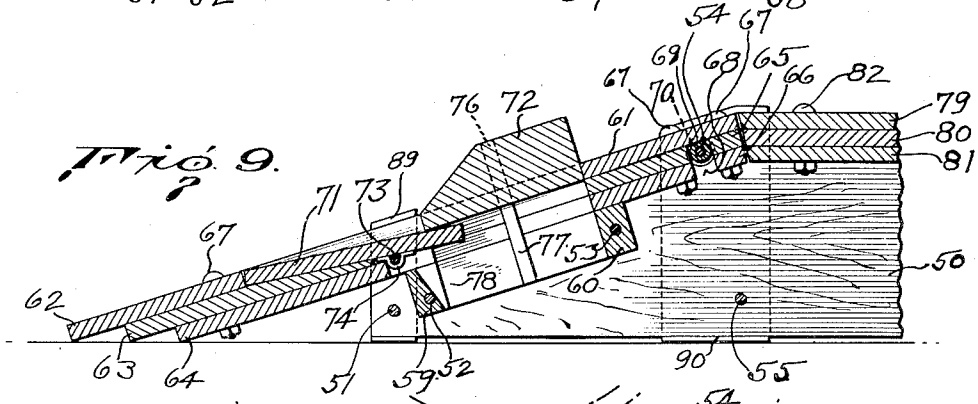
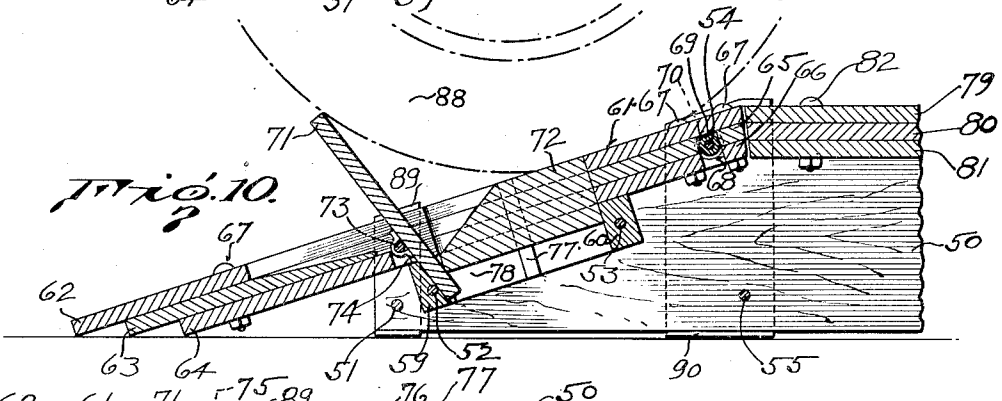


Fig. 10.



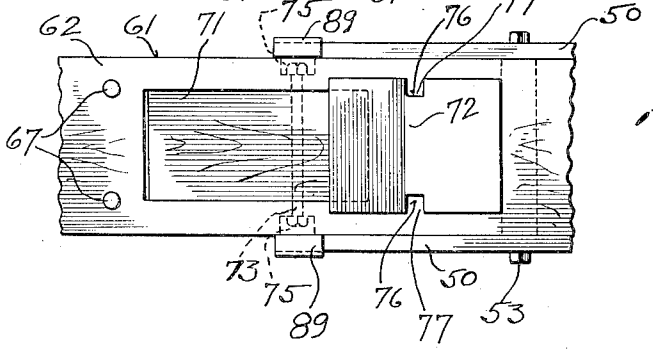


Fig. 11.

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UNITED STATES PATENT OFFICE

1,922,554

LIFTING DEVICE

Marshall K. McCosh, Reisterstown, Md.

Application July 21, 1931. Serial No. 552,280

9 Claims. (Cl. 254—88)

This invention relates to lifting devices and has special reference to vehicle jacks on which wheels of a vehicle are run to elevate said wheels and the portions of the vehicle associated therewith.

The objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanation and the accompanying drawings illustrating what now appears to me to be the preferred mechanical expressions or embodiments of my invention from among other forms, constructions and arrangements within the spirit and scope thereof.

One object of this invention is to provide an improved movable stop and arrangement for actuating the said improved movable stop and also for holding the said movable stop in functioning position at the proper time, that is; at the time there is need for the stop to function. My application filed April 23, 1931, Serial No. 532,342, claims the movable stop.

Another object is to provide an incline that is easy to attach for use and easy to detach when not in use.

Another object is to provide a stop that is easily attached for use and detached when not in use.

Another object is to provide an improved construction for lifting devices.

The detachability of the incline and the stop render the jack easier to handle and store away and more economical to pack and ship.

With the above mentioned and other ends in view, my invention consists of certain novel features, arrangements and combinations as more fully and specifically set forth hereinafter, illustrated in the accompanying drawings, and particularly pointed out in the claims.

In the accompanying drawings—

Figure 1 is a side elevation of what seems to me now to be the preferred embodiment of my invention. It shows the disposition of the parts prior to a vehicle wheel being moved upon it.

Figure 2 is a longitudinal section thereof.

Figure 3 is a longitudinal section of the embodiment shown in Figure 1. Figure 3 shows the disposition of the parts when a vehicle wheel has been moved the maximum distance upon it and the movable stop has been moved into its functioning position.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a section on the line 5—5 of Figure 1.

Figure 6 is a longitudinal section of another embodiment of my invention. It shows the disposition of the parts prior to a vehicle wheel being moved upon it.

Figure 7 is a perspective of the bearing-plate that is fastened to the back of the movable stop in the embodiment shown in Figures 1, 2 and 3.

Figure 8 is a side elevation of another embodiment of my invention.

Figure 9 is a longitudinal section of the rear half of the embodiment shown in Figure 8. It shows the disposition of the parts prior to a vehicle wheel being moved upon it.

Figure 10 is a longitudinal section of the rear half of the embodiment shown in Figure 8. It shows the disposition of the parts when a vehicle wheel has been moved upon it and the movable stop has been moved into its functioning position.

Figure 11 is a plan view of a part of the incline of the embodiment shown in Figures 8 and 9, showing the movable stop and the device for actuating said stop.

Figure 12 is a perspective of the device for actuating the stop in the embodiment shown in Figures 8 to 11, inclusive.

In the embodiment shown in Figures 1, 2, 3, 4 and 5 two thick side boards 1 are rigidly held in spaced relationship to each other by means of steel bolts 2, 3, 4, 5 and 6 (each bolt having a steel washer 7 at each of its ends immediately inside the nuts) and by wood cross members 8 and 9. Bolts 2 and 3 run through lengths of steel pipe 10 and 11. The length of pipe 10 is exactly as long as the distance between the inner sides of the side boards 1. At the ends of the length of pipe 10 are steel washers 12, which washers are inset in the two side boards 1 to a depth equal to the thickness of the washers. Washers 13 at the ends of length of pipe 11 are not inset. One nail (not shown) is driven through each of the side boards 1 into cross member 9 to help prevent it from slipping. Incline 14 is made up of boards 15, 16, 17 and 18 of a width just enough less than the distance between the inside sides of the side boards 1 to permit the incline to move inside the side boards. Board 15 rests on pipe 10; and board 16 is bolted by bolts 19 to the under side of board 15 to strengthen it and form one side of slot 20 which fits over pipe 10. Boards 17 and 18 are bolted by bolts 21 to the under side of board 15 at its forward end to give the shape shown at that end of the incline and also to form one side of slot 20. To the under side of board 18 is fastened, by two bolts 21, the two nearer the forward end of the incline, two arms 22, formed of steel 1½" wide, reaching under the movable stop 23. Movable stop 23 is made of a board. To the back of it is fastened bearing-plate 24 by means of screws in screw holes 25

shown in Figure 7. Bearing-plate 24 is formed as shown in Figure 7. The flat center part 26 of the upper side as shown in Figure 7 fits against the back of the movable stop as shown in Figure 5. The shoulders 27 extend over the top of bearing 28, which bearing 28 is, roughly, a semi-circular, upward extension of plate 29, through which there is a round hole holding bolt 30. The ends of bearing-plate 24 have openings 31 in them which fit over the bolt 30, the upper end of the opening bearing on the bolt 30. One side of each of the two shoulders 27 is cut back at 32 far enough to permit the bearing-plate 24 to assume the position shown in Figure 3. (The plates 29 and the side boards 1 may also be cut away somewhat to lessen the amount of cutting back necessary in the shoulders 27.) Wood cross member 9 serves also to reinforce bearing 28 in holding bolt 30 in place against the pressure exerted against it through bearing-plate 24 when a vehicle wheel is against the movable stop 23. Cross member 9 is held in place against pressure from bolt 30 by bolts 5 and 6. The lower end of movable stop 23 cannot move farther towards the forward end of the jack than bolt 4. Steel plates 29 and 33 strengthen the assemblage. Through them extend the bolts 2, 3, 4, 5, 6 and 30. The lower ends of said plates are bent at right angles to fit against the bottom edges of side boards 1 for a distance equal to the thickness of said side boards, a V is cut out of the upper ends of plates 33 midway of the sides, and the ends bent at right angles so as to fit against the upper edges of said side boards a distance equal to the thickness of the side boards. The upper ends of plates 29, also, are bent at right angles, except the parts which are the upward extensions 28, and fit over the upper edges of the side boards 1. The fact that the plates 29 and 33 are bent at their ends so as to fit against the upper and lower edges of side boards 1, together with the fact that the bolts 2, 3, 4, 5 and 6 extend through them, minimizes, at least, any weakening effect on the assemblage of any cracks that may develop in the side boards. Small steel plates 34 form two right angles so as to fit against the lower edge and extend a short distance up the outside and inside sides of each side board 1, screws 35 holding them to the said side boards. Steel plate 36 lies against the entire lower edge of wood cross member 8, the ends of plate 36 being bent at right angles and fitting against the outside side of each of the side boards 1, being fastened to said side boards by screws 37 which extend through the side boards and into cross member 8. Screws 38 extend through the side boards 1 and into cross member 8. At each end of bolt 30 there is, first, the nut on the extreme end, then steel washer 39, one end of bearing-plate 24 with the opening 31 fitted over said bolt, steel washer 40, and bearing 28.

The embodiment shown in Figures 1, 2, 3, 4 and 5 is used in the following described manner:—

With the parts disposed as shown in Figures 1 and 2 the jack is positioned in line with a vehicle wheel, either in front of or behind the wheel, the lower (rear) end of the incline 14 touching the tire of the wheel at or near the ground or floor. The vehicle is then moved to run the wheel on and up the incline under its own power or by other means. As the wheel moves forwardly of the jack and its center moves over the position of the bolt 2 the forward end of the incline 14 tilts forwardly on the pipe 10, through which bolt 2 runs, until it comes in contact with cross member 8, as shown in Figure 3. The incline is then tilted downwardly in the forward direction, keeping the wheel from moving rearwardly. The incline 14 in tilting forwardly actuates the movable stop 23, by the pressure of board 18 on the face of the movable stop, until the movable stop is in the position of a steep incline, as shown in Figure 3, which is its functioning position, keeping the wheel from moving forwardly farther than where it presses against the movable stop. The tire 41 of the wheel is then in the position shown in Figure 3, and presses against both the incline 14 and the movable stop 23. The incline 14, the movable stop 23 and the tire are then each stable in its respective position. Much of the pressure the lower part of the movable stop 23 exerts against board 18 of incline 14 is more in the general direction of cross member 8 and bolt 2, and against bolt 2, than it is in a vertical direction and against tire 41, and this fact has the effect of holding the movable stop 23 more firmly in its functioning position (which is the position in which it is shown in Figure 3) than if the said pressure were exerted in a direction nearer vertical. The accomplishment of this fact and this effect is one of the objects of this invention. In any device made under this invention much of the force or resistance that holds a movable stop in its functioning position is in or from the general direction of a stationary object which supplies said force or resistance.

With the wheel and the parts of the jack disposed as shown in Figure 3 and having a high degree of stability, work can be done on the vehicle with a higher degree of safety than could be done with the vehicle raised on some other devices. Usually two of these jacks are used at the same time at the two rear wheels or the two front wheels of a vehicle. Four of the jacks can be used at one time, one jack at each of the four wheels of a vehicle. Another advantage of this jack is that being directly under the wheel of a vehicle, it leaves the rest of the underside of the vehicle clear for a workman. At such time as it is desired to rotate the wheel or remove the tire, a block or strong box of some kind is placed under the axle of the vehicle connected with that wheel, a hand jack, say, the screw or ratchet type positioned thereon and operated to raise the car until the wheel is at least free to rotate. It is often somewhat difficult to position a hand jack under the axle of a vehicle such as an automobile with bumpers and tire carrier unless the vehicle is first raised off the ground or floor.

To lower the wheel, the vehicle is simply moved rearwardly of the jack, under its own power or by other means, in the direction away from the stop 23, on the incline 14. The rear end of incline 14 tilts rearwardly and downwardly and the wheel runs onto the floor or ground. As the rear end of incline 14 tilts rearwardly and downwardly the forward end tilts rearwardly and upwardly and the free ends of the two arms 22 come in contact with the back of the lower end of movable stop 23 and push it back into the approximately horizontal position shown in Figures 1 and 2, in which position the movable stop is out of the way of the parts of the vehicle. The tapered shape of the forward ends of boards 15, 17 and 18 of the incline 14 serves the purpose of lowering the height of that end of the incline from what it would be when it is in the position shown in Figures 1 and 2. No part of the jack should be high enough to strike or be struck by any part of a vehicle other than the wheel.

Either the incline 14 and the movable stop 23, or both of them, can easily be lifted from the body of the jack when not in use, and as easily replaced. This can be done in any device made under this invention. The incline is lifted from the length of pipe 10, and the movable stop from bolt 30. In replacing either one or both of them the rear end of the movable stop is positioned between the free ends of arms 22 and board 18 as shown in Figure 2. Arms 22 are "fool proof" members for pushing the movable stop back into the position shown in Figure 2 when a vehicle wheel descends from the jack: there are no connections or fastenings to be made in replacing the incline or the movable stop that could be overlooked with the result that the movable stop would not be pushed back into the approximately horizontal position.

In the embodiment shown in Figure 6 the construction is similar to the embodiment already described with the following mentioned exceptions. The side boards 1 are longer, the additional length being between cross member 8 and the rear end, at which end is bolt 2—*a*. The incline 14 rests on length of pipe 10—*a*, which is on bolt 2—*a*. The incline 14 does not tilt. (It can be lifted off pipe 10—*a*, however.) The board 15—*a* of the incline 14 extends forwardly only to board 15—*b*, which board is fixed to the two side boards 1 by means of two bolts (not shown) extending through side boards 1 and immediately beneath board 15—*b* so that board 15—*b* rests on the two bolts. Boards 15—*c*, 17 and 18 are bolted together and operate in a manner similar to that of the forward end of incline 14 of the embodiment shown in Figure 2, except that the forward ends of boards 15—*c*, 17 and 18 are raised by two steel springs 42 when a vehicle wheel moves off it in the direction of the rear end of the jack. Springs 42 are seated in wood seats 43 which consist of two round insets in a wood cross member; and are fastened at their two ends by metal clips (not shown), the upper ends of the springs to board 18 and their lower ends to seats 43. Clips at the upper ends are held by two of the bolts 21—*a*, the two ones that are the nearer to the forward end of the jack. This unit composed of boards 15—*c*, 17 and 18 bolted together is not lifted from the jack, as it is fastened to springs 42. Steel plates 33—*a* are similar to steel plates 33 of Figures 1, 2 and 3, except that their upper ends are bent over in one straight line the full width of the plates. Steel plates 33—*b* are similar to plates 33—*a*, except that only one bolt, 2—*a*, extends through them. There are three small steel plates 34, whereas there are two of them in the embodiment shown in Figures 1, 2 and 3. This embodiment is used in the same way as is the first described embodiment. The unit composed of boards 15—*c*, 17 and 18 tilts, whereas the incline 14 tilts in the case of the first described embodiment.

In the embodiment shown in Figures 8, 9 and 10 wood side boards 50 are rigidly held in spaced relationship to each other by means of steel bolts 51, 52, 53, 54, 55, 56, 57 and 58 and wood cross members 59 and 60. Bolts 52 and 53 run through holes in cross members 59 and 60. Incline 61 is composed of boards 62, 63, 64, 65 and 66 of a width just enough less than the distance between the inside sides of side boards 1 to permit of the incline being placed between them without binding. These boards composing the incline are fastened together by bolts 67. At the forward end of the incline is slot 68, the top or closed part of the slot being an area of the bottom of board 62, and the sides of the slot being end edges of boards 63, 64, 65 and 66. This slot fits over length of pipe 69 through which bolt 54 runs. The length of pipe 69 is the same as the distance between the inside sides of side boards 1. At each end of the length of pipe is a steel washer 70 which is inset in the side boards 1 a distance equal to the thickness of the washer. The interior of the incline 61 is cut away for the insertion of movable stop 71 and actuating block 72. Both the movable stop and the actuating block are of less width than the incline. The movable stop pivots on bolt 73, to which it is fastened by steel strap-bearing 74. Bolt 73 fits in a hole in the incline 61 at boards 63 and 64 running in the direction of the width of the incline 61. A hole 75 larger than the hole for the bolt 73 extends in a short distance from each edge of the boards 63 and 64 at the ends of said bolt hole, and in each of the two larger holes a nut is screwed on an end of the bolt 73. In cutting away for movable stop 71 the interior of board 62 is entirely cut away as shown in Figure 9, part of the interior of board 63 is cut away entirely and part of it is tapered so that movable stop 71 lies on the tapered part as shown in Figure 9, and the interior of board 64 is entirely cut away as shown in Figure 9. Actuating block 72 is of a greater thickness than incline 61. The actuating block is tapered at the end next the movable stop 71 so that when it is in the position shown in Figures 8 and 9 a vehicle wheel will run on it and press it in an approximately downward direction to the position shown in Figure 10. The actuating block 72 fits in a rectangular opening which is a little wider than the opening in the incline for the movable stop. This opening extends entirely through the incline 61 and below said incline. The opening is open at its top and bottom. At the two sides of the actuating block are rectangular guide slots 76 which run on guides 77. Below the incline the rectangular opening is bounded by cross members 59 and 60 and sides 78, which sides 78 are fixed to the inside sides of side boards 50. On each of these sides 78 is the guide 77 mentioned above. Each guide 77 extends from the upper side of incline 61 to the bottom of side 78. The end of the rectangular opening nearer movable stop 71 is cut away, except at its extreme sides, to accommodate the movable stop, the part cut away being ⅛'' wider than the width of the movable stop. Cross member 60 is rectangular, and cross member 59 is rectangular except that one side is tapered so that it coincides with the rear face of the movable stop. The incline 61 is reenforced by a steel plate (not shown) fastened to the under side of board 64 at each of its two sides from its lower end to cross member 59 to offset the weakening effect of the interior of the incline being cut away to accommodate the movable stop. The horizontal platform made up of boards 79, 80 and 81 fastened together by bolts 82, is held in position between side boards 1 by two bolts (not shown) extending through the side boards and immediately under board 81 so that board 81 rests on the bolts and the top of board 79 is even with the top of the side boards. Incline 83 is made up of boards 84, 85 and 86 fastened together by bolts 87, and of two other boards (not shown), this incline 83 being the same as incline 61 except that it is not cut away in its interior. Incline 83 rests on a length of steel pipe, which pipe is over bolt 56, in the same way as incline 61 rests on length of pipe 69. At each end of this length of pipe over bolt 56 is a steel washer inset in the inside side of side boards 1 the same as in the case of length of pipe 69

which is over bolt 56. Bolt 58 has a length of steel pipe over it with a steel washer at each end of the pipe: these washers are not inset in the side boards: the length of the pipe is from washer to washer and the ends of the pipe fit tightly against the washers. Incline 83 is lifted from the jack in the same way as is incline 61. Steel plates 89, 90, 91 and 92 strengthen the assemblage. The upper and lower ends of each of these plates are bent to fit against the edges of side boards 50.

The embodiment just described is used in the following manner.—

With the parts disposed as shown in Figures 8 and 9 the jack is positioned in line with a vehicle wheel, either in front of or behind the wheel, the lower (rear) end of the incline 61 touching the tire of the wheel at or near the ground or floor. The vehicle is then moved to run the wheel on and up the incline 61 under its own power or by other means. The wheel pushes actuating block 72 down into the rectangular opening, and the actuating block moves the movable stop 71 into the position of a steep incline, as shown in Figure 10, which is the functioning position of the movable stop. In this position the movable stop prevents the wheel 88 from moving down the incline farther than said movable stop. The wheel can not, of course, move up the incline. Actuating block 72 cannot move downward farther than its position shown in Figure 10, as it is then jammed against the movable stop. All the parts of the jack, and the wheel, are now in positions of stability, and work can be done on the vehicle with safety insofar as the jack is concerned. In this embodiment also, much of the pressure the lower part of the movable stop 71 exerts against the member that holds it in its functioning position is in the general direction of a stationary object holding said member. In this embodiment the holding member is the actuating block 72, and the stationary object is the forward end of the rectangular opening in which said actuating block sits, together with the guides 77. When it is desired to lower the wheel to the ground or floor, the vehicle is moved forwardly of the jack and the wheel runs over board 79 and down incline 83 to the ground or floor.

This embodiment may be used, also, by causing a wheel to move from the ground or floor up incline 83, over board 79 and down incline 61 until it pushes down the actuating block 72 and the movable stop 71 is moved into its functioning position.

Actuating block 72 and movable stop 71 are pushed back by hand into the positions shown in Figure 9 before a wheel is again moved up incline 61.

It is evident that the various members and parts of these embodiments can be constructed of materials other than the materials that are mentioned and described herein, and, also, that the designs and arrangements can be altered considerably without departing from my invention.

I claim:

1. A wheel stop pivotally mounted on a base, and means associated with said stop and so adapted that, when a wheel moves against said means, said means exert pressure on a part of the face of said stop that extends in one direction from the pivotal axis of said stop and thereby tilt said stop, the part of said stop that extends in the other direction from the pivotal axis of said stop thereupon extending upward whereby it can function as a stop.

2. A wheel stop pivotally mounted on a base, and means associated with said stop and so adapted that, when a wheel moves against said means, said means exert pressure on a part of the face of said stop that extends in one direction from the pivotal axis of said stop and thereby tilt said stop, the part of said stop that extends in the other direction from the pivotal axis of said stop thereupon extending upward whereby it can function as a stop, said means locking said stop in said functioning position by being in contact with the said part of the face of said stop.

3. A lifting device comprising a body, an incline pivotally mounted on said body, said incline having an extension forward of its pivotal axis, a stop pivotally mounted on said body, said forward extension of said incline being adapted to actuate said stop into position to stop the forward movement of a vehicle wheel when said wheel has moved approximately to the forward end of said incline, said forward extension of said incline actuating said stop by exerting pressure on a part of the face of said stop that extends in one direction from the pivotal axis of said stop and thereby tilting said stop, the part of said stop that extends in the other direction from the pivotal axis of said stop thereupon extending upward whereby it can function as a stop.

4. A lifting device comprising a body, an incline pivotally mounted on said body, said incline having an extension forward of its pivotal axis, a stop pivotally mounted on said body, said forward extension of said incline being adapted to actuate said stop into, and lock it in, a position to stop the forward movement of a vehicle wheel when said wheel has moved approximately to the forward end of said incline, said forward extension of said incline actuating said stop by exerting pressure on a part of the face of said stop that extends in one direction from the pivotal axis of said stop and thereby tilting said stop, the part of said stop that extends in the other direction from the pivotal axis of said stop thereupon extending upward whereby it can function as a stop, said forward extension of said incline locking said stop by being in contact with the said part of the face of said stop.

5. A lifting device comprising a body, an incline reaching to the top of said body, a stop pivotally mounted on said body, means movably mounted on said device and adapted to be actuated by a vehicle wheel in its movement upon said device, said means being adapted, also, to tilt said stop into position to stop the forward movement of said wheel by exerting pressure on a part of the face of said stop that extends in one direction from the pivotal axis of said stop and thereby tilting said stop, the part of said stop that extends in the other direction from the pivotal axis of said stop thereupon extending upward whereby it can function as a stop.

6. A lifting device comprising a body, an incline reaching to the top of said body, a stop pivotally mounted on said body, means movably mounted on said device and adapted to be actuated by a vehicle wheel in its movement upon said device, said means being adapted, also, to tilt said stop into, and lock it in, position to stop the forward movement of said wheel by exerting pressure on a part of the face of said stop that extends in one direction from the pivotal axis of said stop and thereby tilting said stop, the part of said stop that extends in the other direction from the pivotal axis of said stop

thereupon extending upwardly whereby it can function as a stop, said means locking said stop by being in contact with the said part of the face of said stop.

7. A wheel stop movably mounted on a support, a runway associated with said stop and also movably mounted on said support and adapted to be moved by a vehicle wheel as said wheel moves forwardly on said runway toward said stop and to move said stop to a position to stop the forward movement of said wheel by direct contact with said wheel.

8. A wheel stop pivotally mounted on a support, a runway associated with said stop and movably mounted on said support and adapted to be moved by a vehicle wheel as said wheel moves forwardly on said runway toward said stop and to move said stop about its pivotal axis to a position to stop the forward movement of said wheel by direct contact with said wheel.

9. A wheel stop pivotally mounted on a support, a runway associated with said stop and also pivotally mounted on said support and adapted to be tilted by a vehicle wheel as said wheel moves forwardly on said runway toward said stop and to tilt said stop to a position to stop the forward movement of said wheel by direct contact with said wheel.

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