

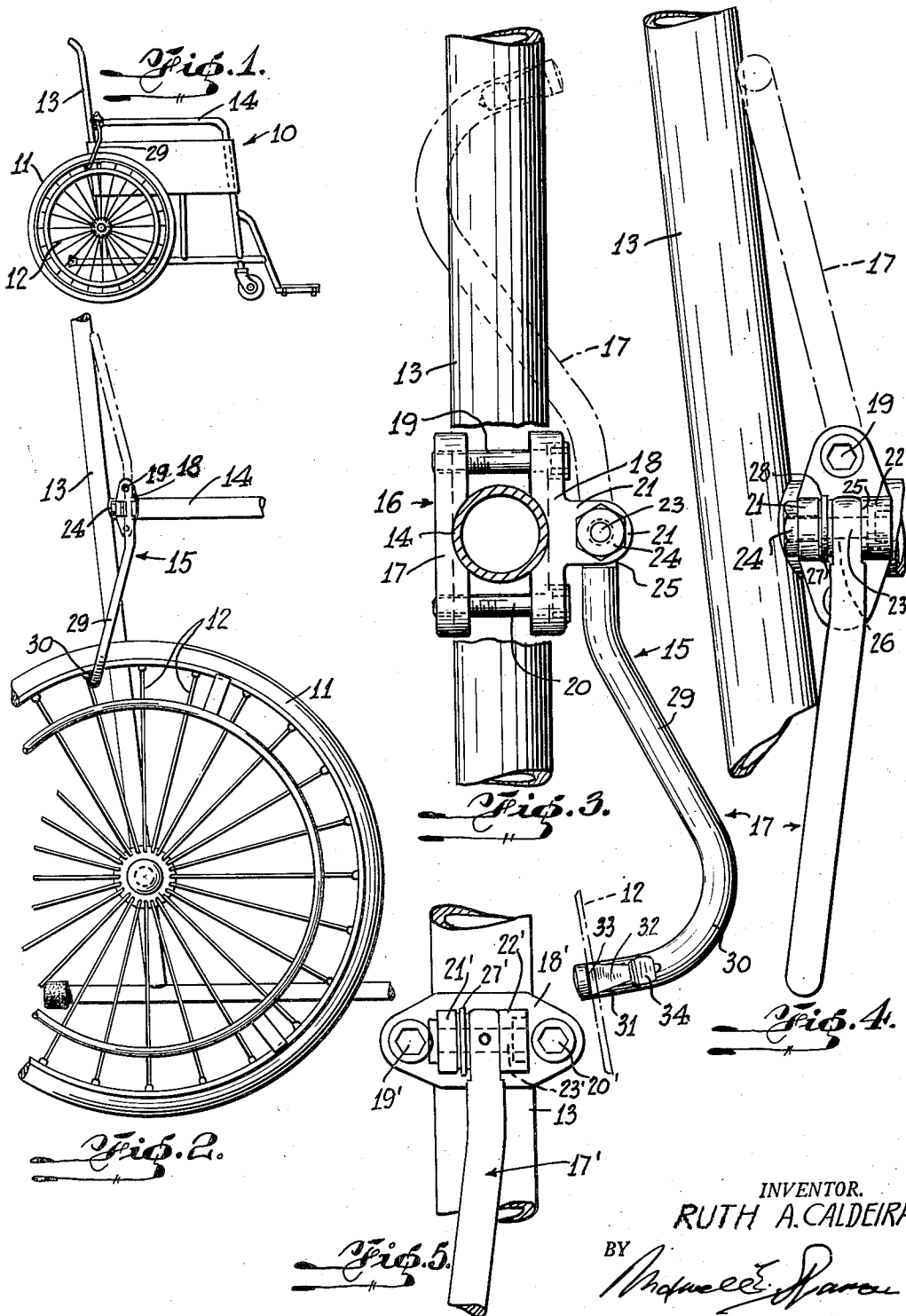
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SAFETY DEVICE FOR INVALIDS' WHEEL CHAIRS

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SAFETY DEVICE FOR INVALIDS' WHEEL CHAIRS

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6 Claims. (Cl. 188-2)

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This invention relates to safety devices for invalid wheel chairs, and more particularly is directed to braking devices which are easily attached to existing wheel chairs, and when so attached operate when desired to lock the wheel chair against forward or backward rolling movement.

An object of the present invention is to provide a braking device for wheel chairs which is sturdy and simple in construction, so as to provide for the inexpensive manufacture thereof, and yet is foolproof and effective in its locking operation.

Another object of this invention is to provide a braking device for wheel chairs which with slight modifications may be secured to either the member forming the arm rest of the chair, on either of the sides thereof, to the member forming the back rest, or to the member from which the foot rest is suspended, the place of attachment depending upon the construction of the particular wheel chair.

A further object is to provide a braking device for wheel chairs which engages between the spokes of the wheels thereof, when in the braking position, and thereby prevents rotation of the wheel in either direction.

Still another object is to provide a braking device for wheel chairs in which the braking element once engaged between the spokes of the wheel is positively retained in the locked position.

A still further object of this invention is to provide a braking device which in one position engages between the spokes of the wheel chair wheels for arresting rotation of the wheel in either direction, and in the inactive position engages against structural members of the wheel chair so as to be retained in inoperative position.

Other and further objects of the present invention will be apparent from the following description and the accompanying drawing.

In accordance with each of the several forms of the invention, the foregoing objects are accomplished by providing a base or clamp for attachment to one of the several structural members of the wheel chair, and pivotally mounting a suitably curved arm upon the clamp or base in such manner that the free end of the curved arm will engage between the spokes of the wheel in one pivoted position of the arm. Furthermore, the free end of the arm is provided with suitably formed notches, within which the adjacent spokes of the wheel engage, when the arm is in braking position, so as to prevent pivoting of the arm away from locking or braking posi-

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tion. Finally, the pivoted arm is so formed as to engage against the side surface of one of the structural members of the wheel chair, to be held or retained in inoperative position.

Preferred embodiments of the invention are illustrated in the accompanying drawing, in which

Figure 1 is a side elevational view of a wheel chair having a braking device in accordance with this invention attached thereto;

Figure 2 is a fragmentary side elevational view, on an enlarged scale, of the wheel chair shown in Figure 1, with the locking, or braking, arm of the attached device shown in inoperative position in broken lines;

Figure 3 is a vertical view, looking at the braking device from the rear of the wheel chair, with portions of the wheel chair broken away, and with the braking arm shown in inoperative position in broken lines;

Figure 4 is a fragmentary side elevation of the wheel chair of Figure 1 and Figure 2, on an enlarged scale, showing the details of construction of the braking device, with the locking arm shown in inoperative position in broken lines; and

Figure 5 is a fragmentary side elevation of a portion of a modified form of the braking device for wheel chairs in accordance with this invention.

Referring to the drawing in detail, and initially to Figures 1, 2, 3 and 4 thereof, there is shown a wheel chair 10 of common construction, and including propelling wheels 11 of relatively large diameter, having radially extending angularly spaced apart spokes 12. The wheel chair 10 further includes a back rest having side frame members 13, which extend substantially vertically, and arm rest frame members 14 extending substantially in a horizontal direction, and joined at their rear ends to the vertical frame members 13. The opposite vertical frame members 13 and the arm rest frame members 14 are preferably formed of metallic tubing in accordance with the modern practice in wheel chair construction.

The braking device in accordance with this invention is generally indicated by the numeral 15, and its details of construction are best seen in the enlarged view of Figures 3 and 4. The braking device 15 includes a clamp portion 16 and a locking arm portion 17. The clamp portion 16 includes a pair of clamp forming members 17 and 18 formed preferably of a metal having high strength characteristics. The member 18 is widest at its central portion, as seen in Figure 4, and tapers towards its opposite ends.

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The member 17 is straight sided, or may be provided with a similar form, and both of the members 17 and 18 are formed with arcuate grooves in their confronting spaces for reception of the tubular arm rest 14. Counter-sunk bores are formed in the member 18, adjacent each of the opposite ends thereof, and securing bolts 19 and 20 extend rotatably through such bores and are tapped into the member 17. As seen in Figure 3, the bolts 19 and 20 are respectively disposed above and below the horizontal frame member 14 and when tightened clamp the members 17 and 18 upon the opposite sides of that frame member. The member 18 is formed with spaced apart lugs 21 and 22 extending outwardly from the central portion thereof, and defining a vertically opening space therebetween. As seen in Figure 4, the thickness of the lug 22 is substantially greater than that of the lug 21. A counter-sunk bore extends horizontally through the lug 22, and a pivot member 23 extends horizontally through the bore in the lug 22 and is tapped into the lug 21. A nut 24 is threaded upon the end of the pivot member or bolt 23 which extends through the lug 21.

The locking arm 17 is formed of a length of round metallic stock, having the sides thereof squared off adjacent one end, as indicated at 25. A bore 26 is formed through that one end of the arm 17, and opens at its opposite ends 30 at the flattened surfaces 25. The locking arm 17 is pivotally mounted upon the clamp 16 by the pivot member 23 extending through the bore 26 of the arm. A locking washer 27, and a pair of plain washers 28 on opposite sides of the locking washer, are interposed between the flat surface 25 of the arm 17 and the inner surface of the relatively thin lug 21. Rotation of the pivot member 23, in one direction relative to the lugs 21 and 22, will effect the springing of the thin lug 21 towards the relatively thick lug 22, and will reduce the distance between the lugs for clamping the washers against the face of the locking arm. This structure provides means for varying the drag, or resistance to pivoting, of the arm 17.

Viewed at right angles to the plane of pivoting, as in Figure 3, the arm 17 is preferably formed with an outwardly inclined portion 29, which at its lower end extends into the inwardly curved portion 30. The free end of the arm 17 is formed with a straight portion 31 extending inwardly, and formed with inclined notches 32 on each of the opposite sides thereof. The notches 32 are deepest at their end adjacent to the free extremity of the arm 17, and at these deepest ends are provided with straight walls 33 extending at right angles to the plane of movement of the arm 17 about the pivot 23.

The arm 17, when viewed from the outer side, in a plane parallel to the plane of movement about the pivot 23, as shown in Figure 4, is inclined rearwardly towards the vertical frame member 13, for a purpose to be hereinafter set forth. The arm 17 is formed with a longitudinally arcuate recess 34 on the rear side thereof, adjacent the end of the notch 32 remote from the free extremity of the arm. The arm 17, being formed of a metallic material, has inherent resilience, and when it is rocked upwardly to the position shown in broken lines in Figures 2, 3 and 4, the portions of the arm having the arcuate recess 34 formed therein will engage against the front surface of the vertical frame member 13. A portion of the vertical frame

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member 13 will be resiliently received within the recess 34 and such engagement will prevent the inadvertent swinging of the arm from this inoperative position.

When it is desired to lock the wheels 11 of the wheel chair against rotation in either direction, the arm 17 is rocked downwardly about the pivot 23 into the position shown in full lines in the several views of the drawing. In this position, the end 31 of the arm will extend between adjacent spokes 12 of the wheel. Rotation of the wheel in either direction will then cause one or the other of the spokes on opposite sides of the end 31 of the arm to bear against that portion of the arm. When the spoke 12 bears against the portion 31 of the arm, the spoke will be disposed within the notch 32 formed therein, and will prevent swinging of the arm out of this locking position, by engaging against the right angled wall 33 of the notch 32, as seen in Figure 3. The specific construction set forth above provides a braking device for wheel chairs in which the frictional drag acting against pivoting of the arm 17 can be adjusted, and in which the arm is retained either in inoperative position, as shown in broken lines in the several figures of the drawing, or in operative wheel locking position as seen in full lines.

In Figure 5, a modified form of the braking device in accordance with this invention is illustrated, which is adapted to be attached to the vertical frame member 13, rather than to the horizontal frame member 14 as set forth in the detailed description of Figures 1, 2, 3 and 4. In this modified form, the lugs 21' and 22' extending outwardly from the clamp forming member 13' are each disposed in a plane extending at right angles to a line drawn through the securing bolts 19' and 20'. This is to be distinguished from the disposition of the lugs 21 and 22 in the first form of the invention, which lugs are disposed in planes extending parallel to a line drawn through the clamping bolts 19 and 20. The lugs 21' and 22' provide a support for the pivot member 23' which forms a substantially horizontal pivoting axis for the locking arm 17'. In the modified form the operation of the braking device is identical with that set forth above in connection with the first form of the invention, with the exception that the arm 17 continues to engage against the side of the vertical member 13 for retention in the inoperative position.

It is understood that the braking device can be adapted to operate on the left hand wheel of the wheel chair, as distinguished from the arms 17 and 17', which are each adapted to lock the right hand wheel of the chair, by reversing the respective parts.

While I have illustrated and described preferred embodiments of my invention, it is to be understood that I do not wish to be limited to the precise structure thereof, as obviously various modifications and changes may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

What I claim is:

1. In combination with an invalid's wheel-chair including spoked wheels and side frame members; a braking device comprising a clamp mounted on one of said side frame members, a pivot member on said clamp, a locking arm pivoted at one end on said pivot member and formed with a hooked free end loosely projecting axially between a pair of spokes on the adjacent one of said wheels in one pivoted operative position of

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said arm, means on said clamp frictionally engaging the pivoted end of said arm and resisting the swinging of the latter, means on said arm receiving a spoke bearing against said arm when the latter is in said one operative position and resisting pivoting of said arm from said one position, and means on said arm engageable with one of said side frame members when said arm is in another pivoted inoperative position yieldably retaining said arm in said inoperative position.

2. The combination according to claim 1, wherein said clamp includes a pair of spaced outwardly extending lugs, and said pivot member consists of a headed bolt extending loosely through one of said lugs and tapped into the other of said lugs, said locking arm being pivoted on said bolt between said lugs, said one of said lugs being relatively thick and said other of said lugs being relatively thin, and including locking washers interposed between the pivoted end of said arm and said relatively thin lug, whereby rotation of said bolt in one direction relative to said lugs will spring said relatively thin lug toward said relatively thick lug to urge said locking washers into frictional engagement with said arm for resisting swinging of the latter.

3. The combination according to claim 1, wherein the axis of said pivot member is disposed in a plane substantially parallel to the plane of rotation of the wheels so that said arm will swing in a plane at right angles to said plane of rotation.

4. The combination according to claim 3, wherein said means resisting pivoting of said arm from the operative position includes a pair of tapered recesses formed in the opposite sides of said arm in the hooked free end thereof, each of said recesses having its greatest depth at the end thereof closest to the free end of said arm and being formed with a wall at the end of greatest depth disposed at right angles to the plane of movement of said arm whereby a spoke received in one of said recesses will engage against said wall thereof and prevent pivoting of said arm from said operative position.

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5. The combination according to claim 1, wherein said means on said arm engaging one of said frame members and yieldably retaining said arm in an inoperative position includes a longitudinally arcuate detent recess formed in one side of said arm adjacent the free end thereof, said recess receiving said one of said frame members in said inoperative arm position.

6. A braking device for an invalid's wheelchair having spoked wheels, opposite back-rest side frame members, and opposite arm-rest side frame members; said braking device comprising a clamp adapted to be secured to one of said arm rest side-frame members, a pivot member on said clamp having its axis in a plane substantially parallel to the plane of rotation of said wheels and disposed outside of the periphery of the latter, a locking arm swinging at one end on said pivot member and formed with a hooked free end loosely projecting axially between a pair of the spokes of the associated wheel when said arm is pivoted to operative position, means on said clamp frictionally resisting the swinging of said arm, means on said arm engageable with the wheel spokes in said operative position for resisting swinging of said arm from said operative position, and means on said arm engageable with the adjacent one of said back-rest side frame members when said arm is in an inoperative position thereof and yieldably resisting movement of said arm from said inoperative position.

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