A. DUTMER.

INVALID'S CHAIR.

APPLICATION FILED MAR. 24, 1919.

1,317,360. Patented Sept. 30, 1919.

Fig. 1.

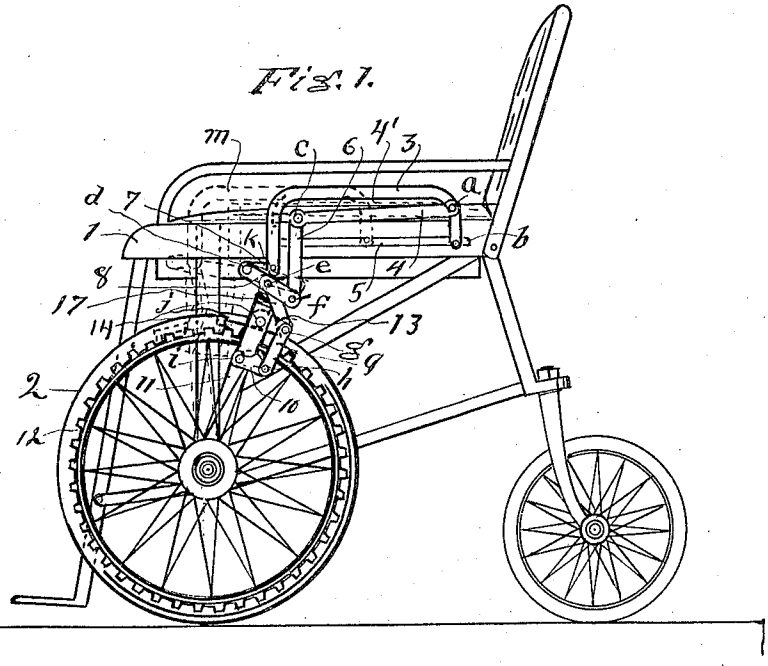



Fig. 2.

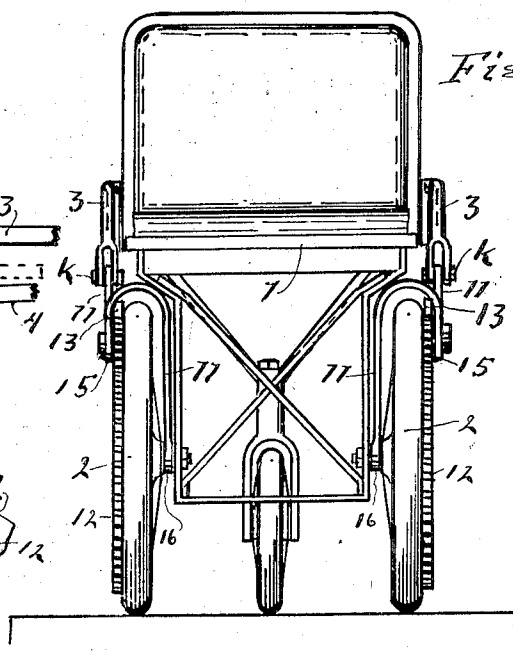



Fig. 3.

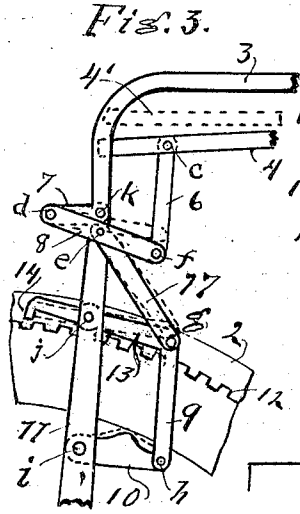



Fig. 5.

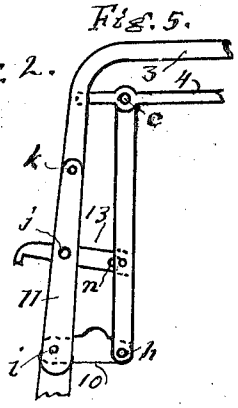
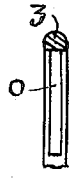



Fig. 4.




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## INVALID'S CHAIR.

1,317,360. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed March 24, 1919. Serial No. 284,843.

*To all whom it may concern:*

Be it known that I, ALBERT DUTMER, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Invalids' Chairs, of which the following is a specification.

My invention relates to improvements in invalids' chairs, and its objects are: first, to provide a means whereby the occupant of the chair may readily propel the chair either forwardly or backwardly without the necessity of touching the wheels with the hands; second, to provide a means whereby every movement of the actuating mechanism will be effective and positive; and, third, to provide a means whereby the movements of the operating parts of the actuating mechanism will be uniform and positive.

I attain these objects by the mechanism illustrated in the accompanying drawing, in which Figure 1 is a side elevation of a chair showing how my invention is applied. Fig. 2 is a front elevation of the same. Fig. 3 is an enlarged elevation of the actuating mechanism. Fig. 4 is a cross section of the actuating arm showing a groove therein for guiding the vertical movement of the actuating arm, and, Fig. 5 is a side elevation of a modified form of the actuating elements of the chair.

Similar reference characters indicate similar parts throughout the several views.

To carry out my invention I provide a hand lever 3 at each side of the chair frame 1. One end of each of these levers is slidably connected with the sides of the frame by means of bolts *b*, or other suitable device, secured to the ends of the levers and adapted to slide freely in the grooves or slots 5 at each side of the chair. The opposite end of each of these levers is pivotally connected with an actuating lever 11, as at *k*. The lower ends of the actuating levers are pivotally mounted upon the axletree or wheel bearing of the chair at 16 so their upper ends may be made to swing freely with the hand levers. The upper ends of the actuating levers are offset and provided with one arm on each that extends upwardly into position to be made to engage the ends of the hand levers to actuate the actuating levers therefrom, and with a wing upon each lever that passes over the upper rim of the wheel and downwardly along the side of the wheel and the actuating rim 12, which is securely connected with the side of each wheel, and each rim is serrated or toothed upon its periphery to form locking receptacles for the actuating pawls 13. The pawls 13 are pivotally connected with the actuating levers 11, near their longitudinal centers, as indicated in Figs. 1 and 3 and have one end offset, as at 14, and arranged to be passed between the teeth on the rims 12 so that the forward or backward movement of the hand levers 3 will act upon the rims to cause the chair to move ahead or to back up as the case may be.

For the purpose of properly actuating the pawls 13 I pivot an arm 4, at one end to each of the hand levers 3, as at *a*, and leave the other ends of said arms free to oscillate vertically, as indicated by their solid and dotted lines in Figs. 1 and 3, I provide for preventing sidewise movement of the free ends of the arms 4 by forming slots *o* in the downwardly extending wings of the hand levers 3 and extending the ends of the arms 4 into these grooves, as indicated in Figs. 3 and 4.

While it would be possible to make a direct connection between the arms 4 and the pawls 13 and brake shoes 10, by providing an adjustable means, as a slot *n*, in each pawl to provide for the reciprocating movement of the pin *g*, I greatly prefer the construction shown in Fig. 3. In this construction I have made offset arms 7 integral with the hand levers 3. To each of these offset arms I pivot a connecting link 8, as at *d*, the opposite ends of said links being pivotally connected with the links 6, as at *f*, and the latter are pivotally connected with the arms 4, as at *c*. I then pivot one end of each of a pair of links 17 to the links 8 at *e* and the other ends of the links 17 to the ends of the pawls 13 at *g* so that when the arms 4 are moved vertically the pawls will be actuated accordingly. As there is a possibility that without means to prevent, the pawls might become disengaged from the teeth on the periphery of the rims 12, especially when the wheels are being revolved backwardly, I provide against such contingency by pivotally mounting a brake shoe 10 to each actuating lever 11 just inside of the rims 12, as at *i*. The other ends of these brake shoes are connected with the pawls by means of links 9 pivotally connected at *g* and *h*, so that when the con-

nected ends of the pawls 13 are elevated to force the ends of the pawls into engagement with the teeth on the periphery of the rim 12, the brake shoe will be brought forcibly against the inner periphery of the rim and thus hold the pawls securely in place until the arms 4 are allowed to again return into their normal positions and release the rims from the grip of the pawls and brake shoes. In this construction I have eliminated the necessity of providing springs for returning the several elements in the actuating mechanism into normal positions.

The pawls 13 are pivotally connected with the overhanging ends 15 of the actuating levers 11 as at *j*, and the free ends of the pawls are connected with the brake shoes 10 by means of links 9, as at *g* and *h*, and with the actuating links 8 by means of links 17, as at *e* and *g*. The dotted lines *m* indicate the extreme forward position of the hand levers 3, and the dotted lines 4′ indicate the extreme upward position of the arms 4. The arm 4 is connected with the link 8 by means of the link 6, as at *c* and *f* so that any vertical movement of the arm 4 will be transmitted to the link 8 and thence to the pawls and brake shoes with the results hereinbefore described. With these connections complete an upward movement of the arms 4 and a forward movement of the hand levers 3 will cause the chair to move forwardly, or with the several elements in the positions indicated and a backward movement of the hand levers will cause the chair to move backwardly.

The links 8 are pivotally mounted upon the arms 7, and the links 17 pivotally mounted upon the links 8 near their longitudinal centers for the purpose of insuring an exact relative movement of the pawls and brake shoes with the movements of the arms 4 whether said arms are at their extreme forward position, at their extreme backward positions or at any intermediate point between these positions.

I do not desire to restrict myself to the connecting elements *b* and 5 for securing the ends of the sliding levers 3 as there are several other well known equivalents for bringing about the same results, as, for instance, 5 might represent parallel rods mounted upon the sides of the frame 1, and *b* might be eye-bolts made to slide over the rods, &c., without deviating from the patentable construction of these elements.

What I claim as new in the art, is:

1. In combination with an invalid's chair and its wheels, an annular serrated rim mounted concentrically with each wheel upon the outer surface thereof, an actuating lever pivotally mounted upon the chair concentric with each wheel between the wheel and the chair, the upper end of said lever curved to pass over, and downwardly outside of the wheel, a sliding hand lever mounted upon each side of the chair and pivotally connected with the upper end of the corresponding actuating lever, a pawl pivotally mounted upon each actuating lever, a vertically oscillative arm pivotally mounted upon each hand lever, and links connecting the oscillative arm with the pawls to actuate the pawls by the vertical movements of the arms.

2. In combination with an invalid's chair and its supporting wheels, a serrated annular rim mounted upon the outer surface of each wheel concentric therewith, actuating levers between the wheels and the chair and concentric with the wheels, the outer ends of said levers extending above the wheels with an arm curved over and extending downwardly along the side of each wheel, a pawl and brake shoe pivotally mounted upon the downwardly projecting end of each of said levers, a hand lever slidingly mounted upon each side of the chair frame, a vertically oscillating arm pivotally mounted upon each hand lever, connecting elements between the oscillating arms and the pawls and brake shoes whereby the pawls and brake shoes may be made to properly engage the rims to propel the chair.

3. In combination with an invalid's chair and its supporting wheels, an annular rim mounted upon the outer surface of each wheel concentric therewith, said rims having their periphery serrated, an actuating lever mounted at one end concentric with each wheel between the wheel and the chair frame, said levers extending upwardly over and around the upper rims of the wheels and an arm on each extending downwardly outside of the respective wheels, a hand lever pivotally connected with the upper end of each actuating lever and the other end of each of said hand levers slidingly connected with the chair frame, a vertically oscillating arm pivotally connected at one end with each hand lever, a pawl and brake shoe pivotally mounted upon the depending end of each actuating lever, and links and connecting rods so connected with the brake shoes, the pawls and the vertically oscillating arms that each movement of the hand levers and the oscillating arms will be transmitted to the pawls and shoes causing them to act upon the rims simultaneously and transform their movements into a revoluble movement of the wheels.

4. In combination with an invalid's chair and its supporting wheels, an annular rim mounted upon the outer surface of each wheel and concentric therewith, an actuating lever pivotally mounted at one end concentric with each wheel between the wheels and the chair frame, said levers extending upwardly and an arm on each passing around and downwardly outside of each wheel, a

hand lever slidingly mounted at one end at each side of the chair frame, the other end of each of said hand levers pivotally connected with the upper end of its corresponding actuating lever, an arm projecting forwardly from the pivoted end of each hand lever, an oscillative arm pivotally mounted upon each hand lever, slots in the hand levers for guiding the free ends of the oscillating arms, a pawl and a brake shoe pivotally mounted upon the depending end of each actuating lever, a lever pivotally connected, at one end, with the projecting arm on each hand lever, links connecting the oscillating ends of the oscillating arms with said levers, and links connecting said levers with the pawls, and with the brake shoes, all so arranged that the movements of the hand levers and the oscillating arms may be transformed into a revoluble movement of the wheels.

Signed at Grand Rapids, Michigan, March 15, 1919.

ALBERT DUTMER.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**