April 15, 1941. T. KILSTROM 2,238,445

WHEELED CHAIR

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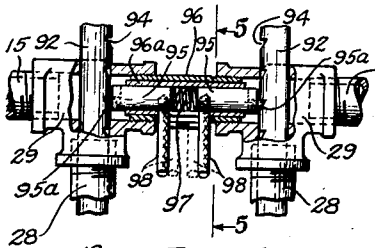


Fig. 4

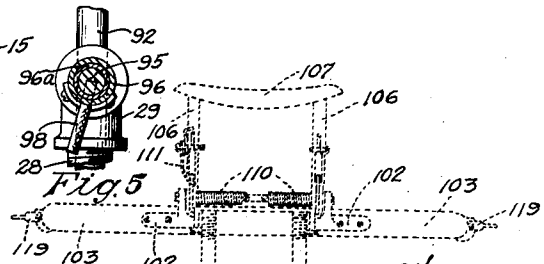


Fig. 5

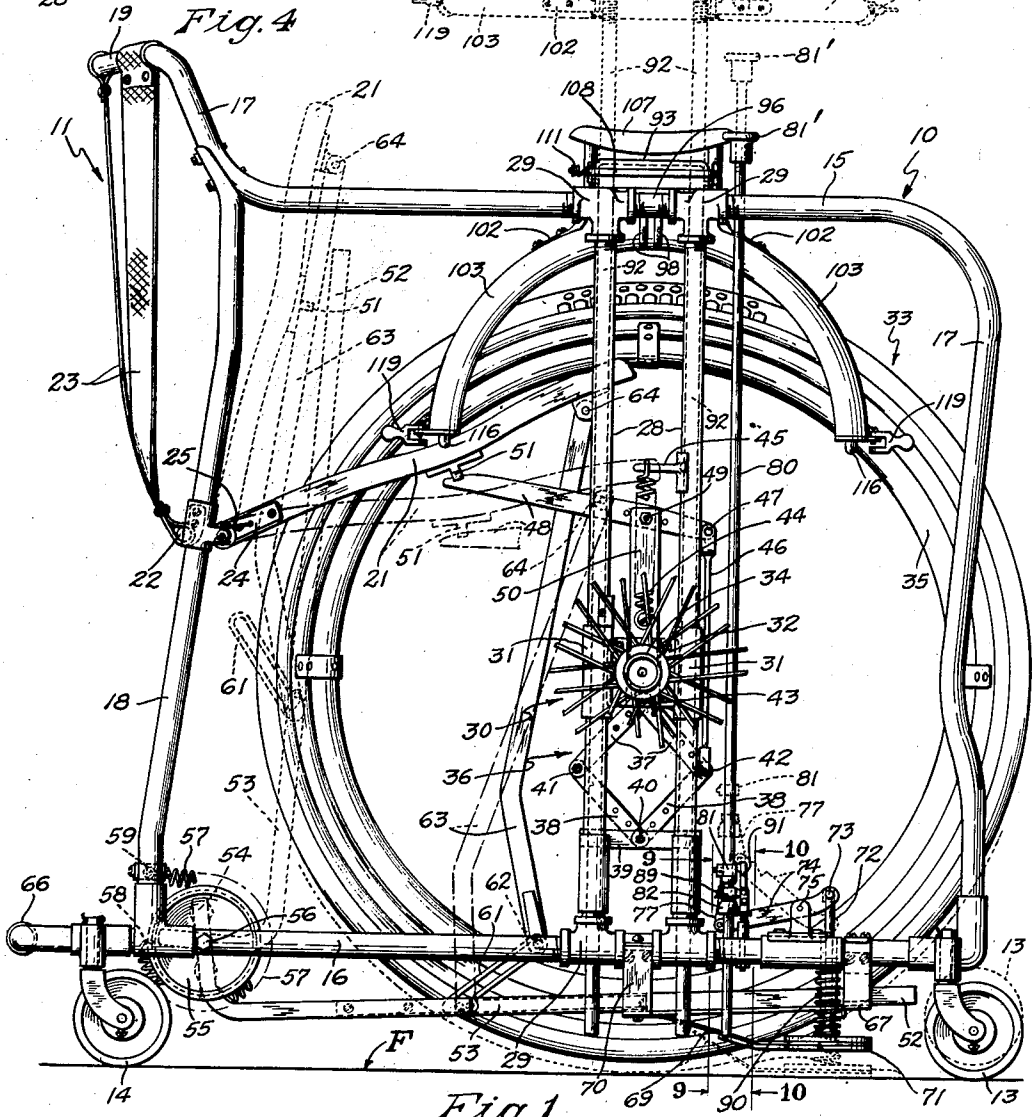


Fig. 1

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WHEELED CHAIR

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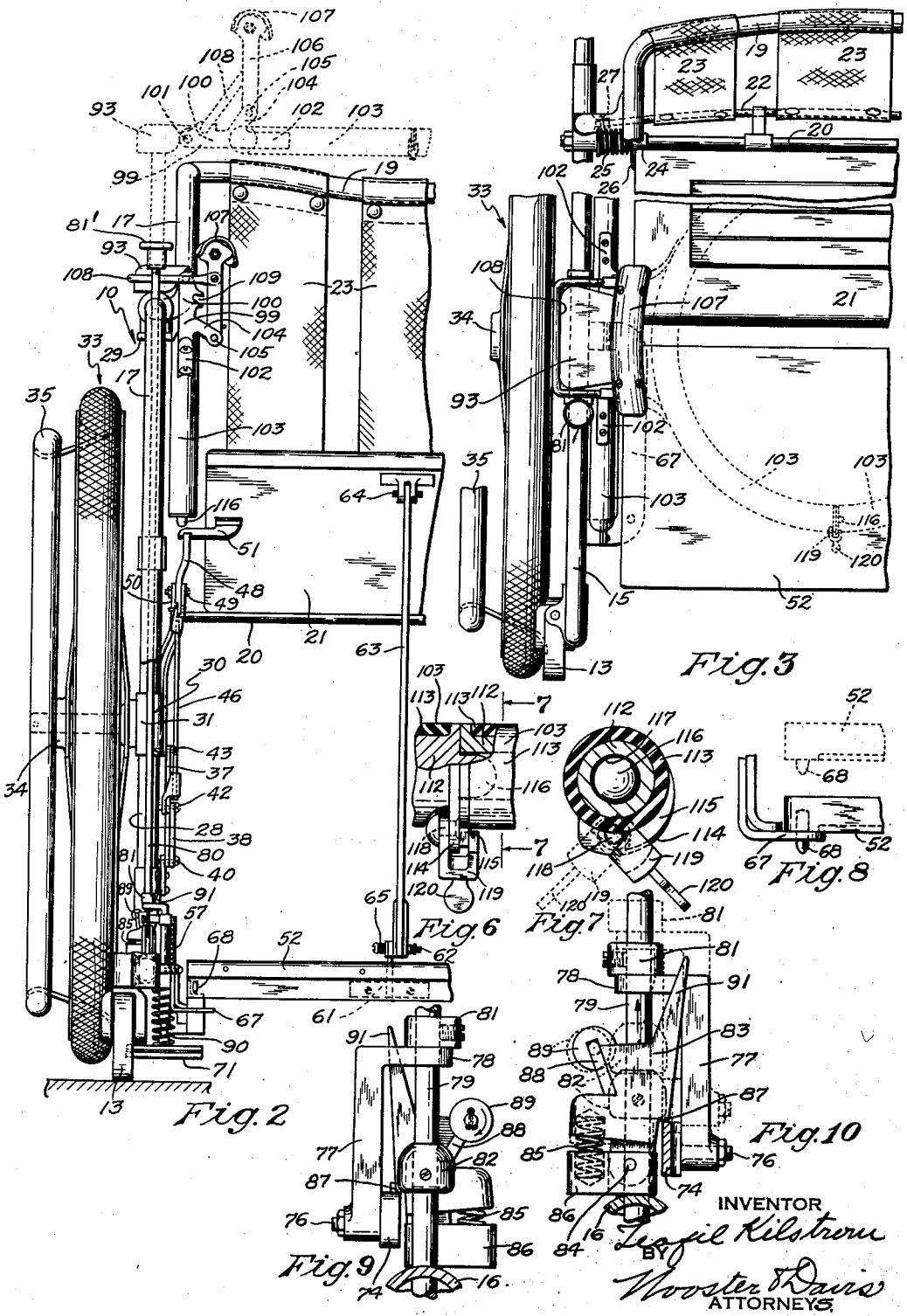


Fig. 2

Fig. 3

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

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WHEELED CHAIR

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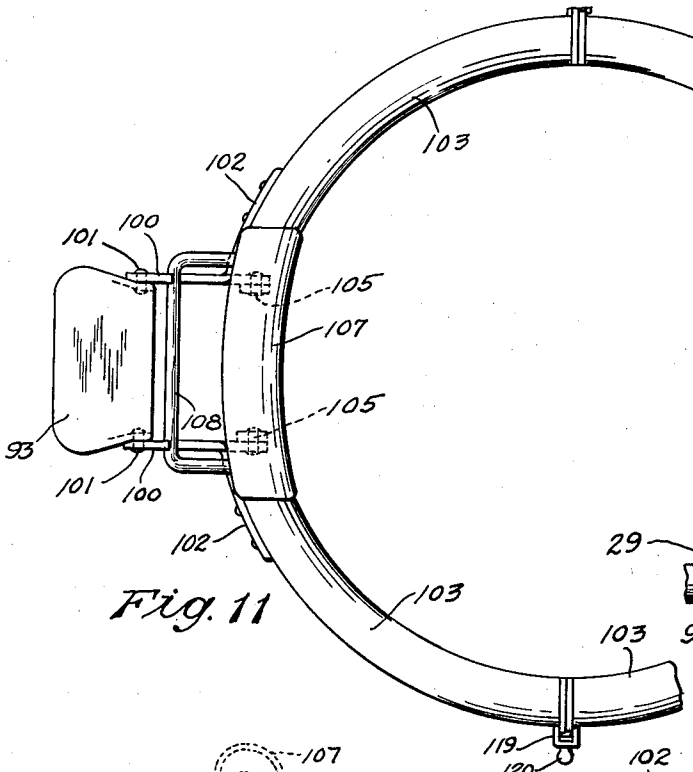


Fig. 11

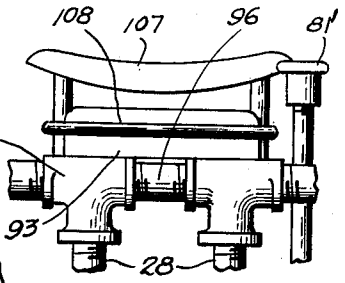


Fig. 13

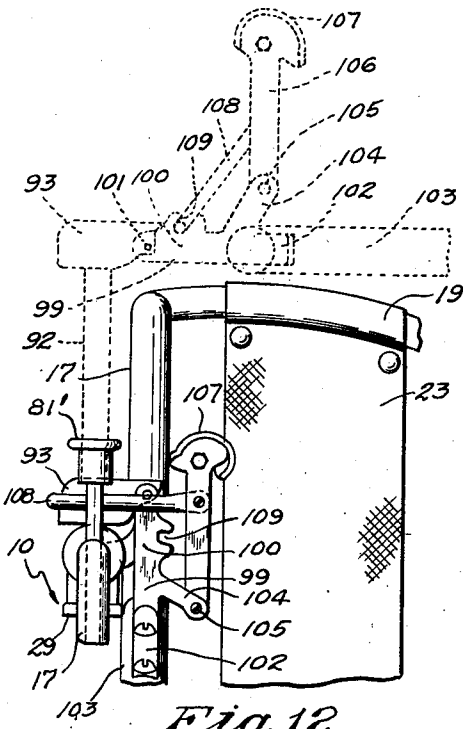


Fig. 12

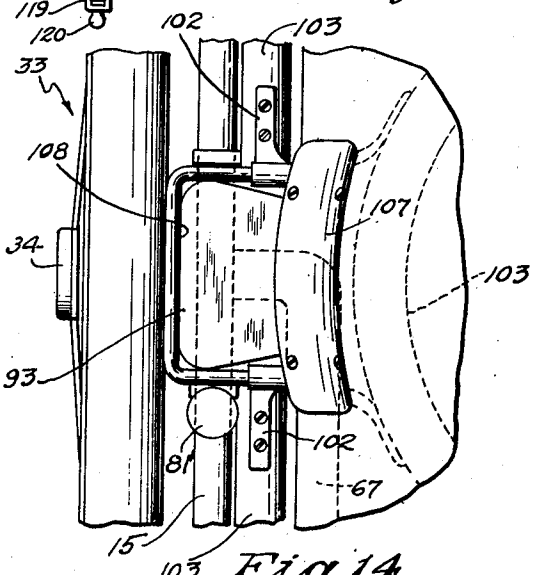


Fig. 14

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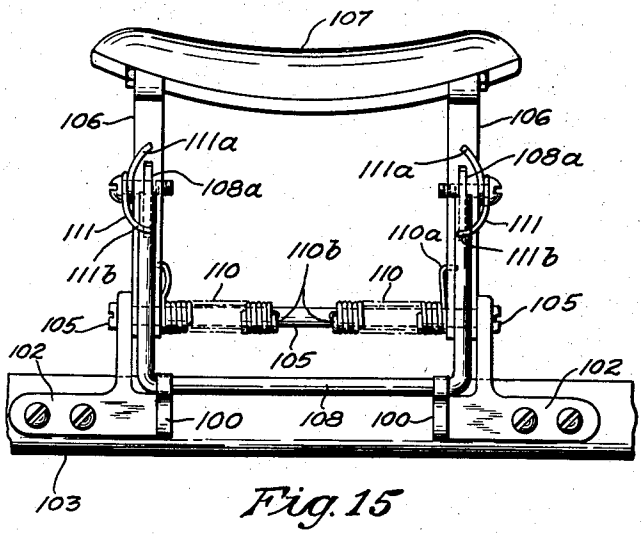


Fig. 15

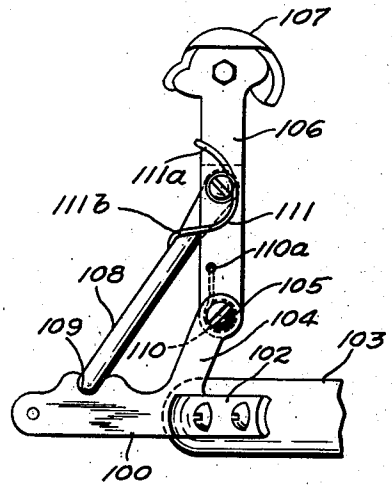


Fig. 16

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2,238,445

WHEELED CHAIR

Teofil Kilstrom, Bridgeport, Conn.

Application February 20, 1939, Serial No. 257,413

8 Claims. (Cl. 155—30)

This invention relates to new and useful improvements in chairs and has particular relation to wheeled chairs.

An object of the invention is to provide a wheeled chair adapted to be used as a partial support for an invalid while he walks whereby to rest him from a sitting or lying posture and to give him mild exercise, and also adapted for use in the usual manner of a wheeled chair whereby an invalid while seated in the chair may propel himself from place to place.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevational view of the chair of the invention, portions of the large wheels being omitted;

Fig. 2 is a front elevational view of one side portion of the chair;

Fig. 3 is a top plan view of the portion of the chair shown in Fig. 2;

Fig. 4 is an enlarged detail view partly in elevation and partly in section showing means for locking a crutch means of the invention in adjusted positions;

Fig. 5 is a detail sectional view taken as along the plane of the line 5—5 of Fig. 4;

Fig. 6 is an enlarged view partly in section and partly in elevation showing a connection between the adjacent ends of a pair of body support members associated with the crutch means;

Fig. 7 is a detail sectional view taken as along the plane of the line 7—7 of Fig. 6;

Fig. 8 is a detail sectional view showing a locking connection between a foot rest employed and a side frame member;

Fig. 9 is an enlarged elevational view of a brake latch means employed, the view being taken as along the plane of the line 9—9 of Fig. 1;

Fig. 10 is a similar view but taken looking in the opposite direction, as along the plane of the line 10—10 of Fig. 1;

Fig. 11 is a top plan view on an enlarged scale of an arm rest and body support in elevated position;

Fig. 12 is a front elevation of the arm rest construction in lowered position on an enlarged scale, and showing it in the elevated position in dotted lines;

Fig. 13 is an elevation of an arm rest looking from the side thereof;

Fig. 14 is a top plan view of the rest in the lowered position;

Fig. 15 is a side elevation on an enlarged scale showing the arm rest in the elevated or use position, and

Fig. 16 is a view thereof looking from the right of Fig. 15.

Referring in detail to the drawings the chair of the invention includes a frame which may be made up of tubular metal members and including similar side members 10 and a connecting back 11. Swivelly mounted ground engaging rollers 13 and 14 are located at the lower front and rear corners respectively of the frame and when the chair is not in use to sit in such rollers are the sole ground engaging support of the chair. Each of the side members 10 includes upper and lower bars or rails 15 and 16 respectively and front and rear vertically disposed posts 17 and 18 respectively. The connecting back includes an upper bar member 19 and an intermediate bar 20. Here it is noted that while the post 17, rail 15 and bar 19 are shown as formed of a single length of tubing such construction is not essential.

A seat 21 is located between the side members 10 and hingedly mounted on the bar 20. Immediately rearwardly of the bar 20 is a second bar or rod 22 and connected with such bar and the top bar 19 are straps or the like 23, which may be of canvas or similar material, comprising a back rest for the chair. Seat 21 is mounted as by hinge elements 24 secured to the seat and adapted to pivot about the bar 20, and associated with such hinge elements are spring means 25 wrapped about the bar 20 and having an end 26 secured to the seat and having end 27 anchored to the bar 22 or other part of the chair frame. The tendency of the springs 25 is to maintain the seat in the raised or folded position shown by the dotted lines in Fig. 1 but are not strong enough to raise the seat from the full line to the upright dotted position.

In addition to the parts above described each side member 10 includes a pair of spaced vertically disposed parallel tubular elements 28 connected with the upper and lower bars 15 and 16 of such member in any suitable manner as through the T-fittings 29 shown. Mounted for vertical movement on each pair of elements 28 is a head 30 including portions 31 embracing the

elements and a web-like portion 32 connecting the portions 31 and extending between the said elements. On each such web is mounted a large diameter wheel 33 including a hub 34 carried by the head and the wheels may also be provided with hand rails 35 adapted to be manipulated by the user of the chair for turning the wheels to propel the chair from place to place.

Below each head 30 is a toggle-like means 36 comprising upper links 37 and lower links 38 the latter being pivoted to a cross piece 39 as by means 40. The links of each pair are in diverging relation and the pairs are pivotally connected as at 41 and 42 and the upper pair are connected with the head portion 32 as by a rivet or the like 43. Connected at its lower end with each head 30 is a coil spring 44 the upper end of which is anchored as at 45 to one of the members 28, and the tendency of these springs is to move the heads 30 upwardly on the tubular elements to raise the wheels 33 off the floor or ground F. As will later be fully set forth the springs 44 when the chair is not in use to sit in act to maintain the wheels 33 in raised positions whereby the chair is resting on the rollers 13 and 14.

At each side of the chair a link 46 disposed adjacent the elements 28 has its lower end secured as by the rivet 42 to a pair of the members 37 and 38. The upper end of each such link has pivoted thereto at 47 the forward end of a lever 48 the intermediate portion of which is pivoted at 49 to the upper end of an arm 50 carried by the head 30 at the side of the chair at which the lever is located. Levers 48 extend to dispose their free end portions toward the back of the chair. On the under side of the seat 21 toward each side edge thereof is secured a clip 51.

Such clips are so located that as the seat is lowered to the full line position the clips at the respective edges of the seat engage the levers 48 at the respective sides of the chair (see Fig. 1). As a person seats himself in the chair his weight serves to depress the seat from the full line position of Fig. 1 to the dot and dash position, and the levers 48 are rocked downwardly from the positions of such figure and acting through the arms 50 transmit a part of the weight of the user to the heads 30 whereby the latter are depressed against the tendency of the springs 44 with the result that the wheels 33 are pressed into engagement with the floor F.

The toggle-like means 36 will yield or move toward collapsed position to permit of such movements of the heads 30. As the large diameter wheels are thus brought into engagement with the floor the forward pair of rollers 13 are raised off the floor as suggested by the dotted lines in Fig. 1. Immediately the user rises from the seat 21 the springs 25 raise the latter to the full line position of Fig. 1, the springs 44 assisting, as the latter again act to raise the wheels 33 off the floor.

A foot rest 52 is arranged between the side members 10 and is carried by a pair of bars 53 the inner or rear ends 54 of which are secured by welding or other suitable means to pulley-like members 55 pivoted on the side frame members 10 as by studs 56. Counter-balancing coil springs 57 are passed partly around the members 55 and have one end secured to the respective members as indicated at 58 and their other ends are anchored to the frame bars 18 at the respective sides of the chair as at 58. The tendency of the springs 57 is to shift the foot rest 52 from the full line position of Fig. 1, wherein the foot rest is located for use, to the dotted line or folded positions shown in said figure. They are not strong enough to lift the foot rest from its lower to the upright or dotted position, but are strong enough to retain the foot rest and seat in the upright position after they have been shifted to this position by the operator.

Foot rest 52 and seat 21 are connected for certain movements together. To this end a bracket 60 is secured to the rear edge of the foot rest intermediate the side edges thereof and includes an inclined loop portion 61 through which passes a stud 62 carried by the lower portion of a link 63 pivoted at its upper end to the under side of the seat toward the forward or free edge thereof, as at 64. Spring means 65 located about the stud 62 provides a certain friction to prevent rattle of the parts, but the friction provided is not sufficient to prevent movement of the stud in the direction of the length of the loop as occasion requires as will appear.

When the chair is not in use to sit in the seat and foot rest may be swung to the dotted line position of Fig. 1 and the various springs mentioned serve to retain the parts in such positions. Now if the chair is to be used the seat may be swung toward horizontal position and it and the foot rest will move to the full line positions of Fig. 1. In such positions the seat is at an incline being held by engagement of its brackets 51 with the levers 48. The foot rest is substantially horizontal and the stud 62 has moved from the inner to the outer end of the loop 61. The user steps onto the foot rest 52 and lowers himself into the seat 21 depressing the same against the action of the various springs, and acting through the levers 48 to force the large diameter wheels 33 into engagement with the floor as shown in dotted lines Fig. 1 and at the same time raise the forward rollers 13 off the floor as above described.

Now by manipulation of the hand rails 35 the user may propel himself about, the rear rollers 14 serving to balance the chair on the wheels 33. Here it is pointed out that a lower back cross bar 66 serves to brace the lower rear portions of the side members 10. The lower forward portions of such members carry extensions or supports 67 extending inwardly toward one another, and on its underside adjacent each end the foot rest 52 is provided with studs 68 (see particularly Fig. 8) which when the foot rest is in position for use, pass through openings in such extensions or supports and thereby provide interlocking engagement between the foot rest and the lower forward portions of the side members 10 whereby to prevent spreading of the latter under the weight of an occupant of the chair and whereby such clips or extensions serve to brace and support the foot rest. These studs prevent the rest sliding off the supports 67.

A brake means is provided for holding the chair stationary in any position of the wheels 33. Such means includes a flexible metal arm 69 secured at one end to a bracket 70 on the lower bar 16 of one side member 10 and at its other end carrying a floor engaging pad 71. Secured to the upper side of the arm 69 toward its free end is a short rod 72 to the upper end of which is pivotally secured at 73 one end of a lever 74 pivotally mounted intermediate its ends as at 75 on the side member 16. A pivot means

76 connects the lower end of a link 77 with the rear end of the lever 74.

Passing through a lateral extension 78 of the link 77 is the lower end portion 79 of a rather long upright operating rod 80 to the upper end of which may be secured a hand knob 81' located convenient for manipulation by a person seated in the chair. This rod passes through openings in the side members 15 and 16 and is guided for vertical sliding movement therein. Secured to the lower end portion 79 of rod 80 in spaced relation to one another and at opposite sides of the link extension 78 are a collar 81 and a cam means 82. It will be noted (see Figs. 9 and 10) that the collar 81 and cam means 82 are spaced so that the rod 79 may have a certain amount of movement relative to extension 78.

A catch means 83 is pivotally mounted at 84 on a support 86 secured to member 16 and a coil spring 85 between said means and the block-like support 86 constantly tends to shift the catch means about said pivotal mounting whereby to keep a shoulder portion 87 of the catch means over the lever 74 to hold it in the full line position of Fig. 1 with the brake pad 71 spaced from the floor. Fixed to the catch means by a part 88 is a roller 89 located in the path of movement of the cam means 82 when the latter is moved vertically by lifting of the operating rod 80.

Therefore when the brake means is in released position as shown by the full lines in Fig. 1 and it is desired to apply the brake either to maintain the chair stationary when a person is entering or leaving the same or at any other time, it is but necessary to lift upwardly on the rod 80 to have the cam means 82 engage the roller 89 and shift it from the full to the dotted line position as shown in Fig. 10. This movement of the roller will rock the catch 83 about its pivotal mounting 84 against the action of the spring 85 whereby to shift the shoulder 87 of the latch means from over the link. Thereupon the brake arm 69 is caused to flex and the pad 71 is forced against the floor by a coil spring 90 located about the rod 72. This spring is compressed when the brake pad is held off the floor and therefore immediately the catch is released the said spring forces the brake pad against the floor. To again release the brake the user presses downwardly on the hand knob 81' to cause the collar 81 to engage the link extension 78 and force the link downwardly carrying the lever 74 about its pivot 75 in a direction to draw the rod 72 upwardly to raise the pad 71 off the floor and compress the spring 90. Catch 83 includes an extension 91 above which the lever 74 does not pass when the brake is applied and therefore as the lever is shifted on depression of the operating rod 80 it will move along the edge of extension 91 into position to permit the catch to again move its shoulder 87 over the lever 74 to secure the latter in position with the brake released.

The chair includes a crutch means whereby the user of the chair may partially support himself while walking if desired. Such crutch means is of the same construction at each side of the chair and a description of one such side will, it is believed, be sufficient. A pair of rods 92 are telescopingly arranged to slide in the parallel tubular elements 28 and such rods have their projecting upper ends connected by a hand piece or the like 93. The rods may be withdrawn vertically from the tubular elements as suggested by the dotted lines in Figs. 1 and 2 and each rod on its inner side is provided with notches 94 (Fig. 4) adapted to be engaged by the projecting ends 95a of spring pressed pawls 95 whereby to secure the rods in the desired positions of adjustment.

The pawls 95 are located in a connecting portion 96 arranged between the fittings 29 and slide in a sleeve 96a. A coil spring 97 positioned between such pawls urges them outwardly toward the rods. Finger pieces 98 are provided to be squeezed toward one another to withdraw the pawls from engagement with the rods when the latter are to be shifted back into the elements 28. A bracket 99 has an arm portion 100 pivoted to the hand piece 93 at 101 and includes arcuate portions 102 secured to a semi-circular body support 103. This body support comprises a metal tube covered with rubber.

Bracket 99 includes ears 104 to which pivots 105 secure the free ends of arms 106 of a U-shaped arm pit rest including a pad portion 107 to engage under the arm pits of a user. Connected with said arms 106 is a bail-like latch means 108 and the bracket portion 100 is provided in one edge with a notch 109 to receive the connecting portion of the means 108 as shown by the dotted lines in Figs. 2 and 12. When the crutch means of the invention are not in use the body supports 103 are in folded positions located at the sides of the side members 10 of the chair frame. This is as shown by the full lines in Figs. 1, 2 and 3.

When the crutch means are to be used the rods 92 are drawn up to the desired extent and the chair seat 21 and the foot rest 52 are swung to the raised or folded out of the way position shown by the dotted lines in Fig. 1. If the body supports are desired it is necessary to release the latch means 108, which it is noted is looped over the hand piece 93 maintaining the bracket 99 and all parts carried thereby in a folded relation. The bail-like latch means being swung up over the hand piece 93, springs 110 about the pivots 101 swing the bracket upwardly to a horizontal position as to the dotted line position of Figs. 2 and 12 and the position of Figs. 15 and 16. At the same time springs 111 associated with the pivots 105 swing the arm pit rest from a position at the side of and parallel with the body support 103 to a position substantially at right angles to such support whereby the arm pit rest is in extended position for use as in the dotted line position of Fig. 2. As the arm pit rest is swung to the mentioned position the bail-like latch means engages in the notch 109 as shown in the mentioned figure whereby to provide a brace for the said arm pit rest. One end 110a of each spring 110 is secured to arm 106 while the other end 110b is secured to rod 105 so that these springs tend to swing arms 106 and rest 107 to the left or outwardly as viewed in Fig. 16. One end 111a of the spring 111 engages an arm 106 while its other end 111b engages over a side arm of the latch 108 so as to tend to move the free end of this arm downwardly, but as the pivoted ends 108a of these arms are reduced and extend into slots in arms 106 their lower walls form a stop with the arms 106 to limit this downward movement. The connecting outer portion 108 seats in notches 109 to hold the rest in the upright position and prevent it being pushed outwardly by pressure of the body. As the body of the user is on the inner sides of these rests they do not move inwardly except as they may

yield inwardly with movements of the body so as not to pull against the user's arms.

The semi-circular body supports 103 each include a metal or other rigid inner portion 112 covered with rubber or other cushioning material 113 and at the extreme ends of the supports the metal projects laterally of the covering providing flange-like portions 114 and 115. In addition the core or inner portion 112 of one semi-circular support may have a projection 116 projecting beyond the end of the covering of said support while the ends of the other support are open providing recesses 117 to receive said projecting portions 116 when the device is in use.

When the semi-circular body supports are positioned for use the ends of one are in abutting relation with the ends of the other. The projections 116 of one enter the recesses 117 in the ends of the other to retain them in alignment and the extending flange-like portions 114 and 115 are in abutting relation. Secured to the said flange 114 as by a rivet or other pivot means 118 is a latch means 119 comprising a U-shaped body having a finger piece 120 thereon for manipulation thereof. After the ends of the body supports are brought into abutting relation the latch means 119 are swung to latched positions wherein their U-shaped portions embrace the flanges 114 and 115 and secure them in abutting relation. That is said latch means are swung on their pivots 118 from the dotted to the full line position of Fig. 7.

The dotted lines in Fig. 3 show the manner in which the ends of the pair of body supports abut and are secured in such relation when such supports are in their extended or useful positions. It will be understood that the two semi-circular body supports when their ends are connected as described provide a circular support about the body and under the arms of an invalid using the crutch means. When the invalid is using the crutch means the chair seat 21 will be in folded position and the large wheels 33 will be off the floor, the chair being supported entirely by the rollers. During the time the invalid is entering or leaving the chair and while he is adjusting the crutch means and the body support the brake means should be applied whereby to prevent any casual movement of the chair. When the rests 107 are lowered they provide arm rests for anyone sitting in the chair.

As the crutch means and the body support are designed to take part of the invalid's weight it will be apparent that he may walk about with the chair so as to rest himself from a sitting posture and at the same time exercise his legs. During such times the body of the invalid may be completely enclosed or encircled by the body supports 103 so that he cannot fall, and the chair seat and foot rest are in out of the way positions. When the crutch means is not to be used the finger pieces 98 are squeezed toward one another to release the pawls from the notches in the rod 92 whereupon the latter may be lowered into the elements 28. Then the body supports 103 are disposed in folded positions at the sides of the chair and the bail-like latch means 108 is hooked over the hand piece 93 to secure the arm pit rest and the body supports in folded positions.

If desired a supporting bracket could be secured to the rear members 18 to support a bed pan under the seat 21 which seat could have the usual toilet seat opening with a cover to permit use as a chair seat.

Having thus set forth the nature of my invention, what I claim is:

1. In a wheeled chair, a frame comprising spaced side members and a connecting back, front and rear ground engaging rollers on said frame, a seat between said side members and hinged for swinging movement from a raised position adjacent the back to a horizontal position supporting a person, a head mounted on each of said side members for vertical sliding movement thereon, a large diameter wheel on each of said heads, spring means connected with said heads and normally tending to maintain them in position with said wheels raised off the floor whereby said chair is supported on said rollers only, levers pivoted on said frame members and connected with said heads, and said levers projecting into the path of movement of the seat as it is moved to horizontal position whereby as a person occupies said seat his weight acting through said levers moves said heads against the tendency of said springs to cause said wheels to engage the floor and thereby raise certain of said rollers off the floor.

2. In a wheeled chair including a frame comprising side members and ground rollers on said frame, said side members each including an upper and a lower bar and a pair of parallel members connecting said bars, heads on said latter members and vertically movable relative thereto, large ground engaging wheels mounted on said heads, spring means connected with said heads and normally tending to keep the same in positions with said wheels spaced from the ground, and means for shifting said heads against the tendency of said springs to bring said wheels against the ground.

3. In a wheeled chair including a frame comprising side members and ground rollers on said frame, said side members each including an upper and a lower bar and guide means connecting said bars, heads on said guide means and vertically movable relative thereto, large ground engaging wheels on said heads, spring means connected with said heads and normally tending to keep the same in positions with said wheels spaced from the ground, a seat between said members, means mounting said seat for swinging movement from a raised out of the way position to a horizontal position wherein it is in use, means connected with said heads and arranged in the path of movement of the seat whereby as the latter is moved to horizontal position it moves said means and presses said wheels against the ground in opposition to said springs, and spring means for shifting said seat to raised position when released.

4. In a wheeled chair including a frame comprising side members and rollers supporting said frame, a vertically adjustable crutch means on each of said members, a semi-circular body support on each of said crutch means, means mounting said body supports on said crutch means for movements from positions at the sides of the latter to positions extending toward one another whereby to form an encircling frame about the body of a user of the crutch means, and means to secure together the adjacent end portions of the body supports when they are in the last named positions.

5. In a wheeled chair including a frame comprising side members and rollers supporting said frame, a vertically adjustable crutch means on each of said members, a semi-circular body support on each of said crutch means, means mount-

ing said body supports on said crutch means for movements from positions at the sides of the latter to positions extending toward one another whereby to form an encircling frame about the body of a user of the crutch means, and means for securing said body supports in the last named positions.

6. In a wheeled chair including a frame comprising side members, a vertically adjustable crutch means on each of said members, a bracket pivotally mounted on each of said crutch means for vertical movement therewith, a semi-circular body support on each bracket and swingable therewith from folded positions at the sides of the crutch means to positions forming a frame about the body of a person using the crutch means, and an arm pit rest pivotally secured to each of said brackets for movements from positions parallel with the brackets when they are folded to positions extending upwardly therefrom when the body supports are in use.

7. In a wheeled chair including a frame comprising side members, a vertically adjustable crutch means on each of said members, a bracket pivotally mounted on each of said crutch means for vertical adjustment therewith, a semi-circular body support on each bracket and swingable therewith from folded positions at the sides of the crutch means to positions forming a frame about the body of a person using the crutch means, an arm pit rest pivotally secured to each of said brackets for movements from positions parallel with the brackets when the latter are in folded positions to positions extending upwardly therefrom when the body supports are in use, latch means for securing said brackets and arm pit rests in their folded positions, and spring means for moving them to extended positions for use on release of said latch means.

8. In a wheeled chair including a frame comprising side members, a vertically adjustable crutch means on each of said members, a bracket pivotally mounted on each of said crutch means for vertical movement therewith, a semi-circular body support on each bracket and swingable therewith from folded positions at the sides of the crutch means to positions forming a frame about the body of a user of the crutch means, an arm pit rest pivotally secured to each of said brackets for movements from positions parallel with the brackets when folded to positions extending upwardly therefrom when the body supports are in use, latch means for securing said brackets and arm pits in folded positions, spring means for moving them to extended positions for use on release of said latch means, and means on said bracket for cooperating with said latch means to lock and brace the said arm pit rests in said extended positions.

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