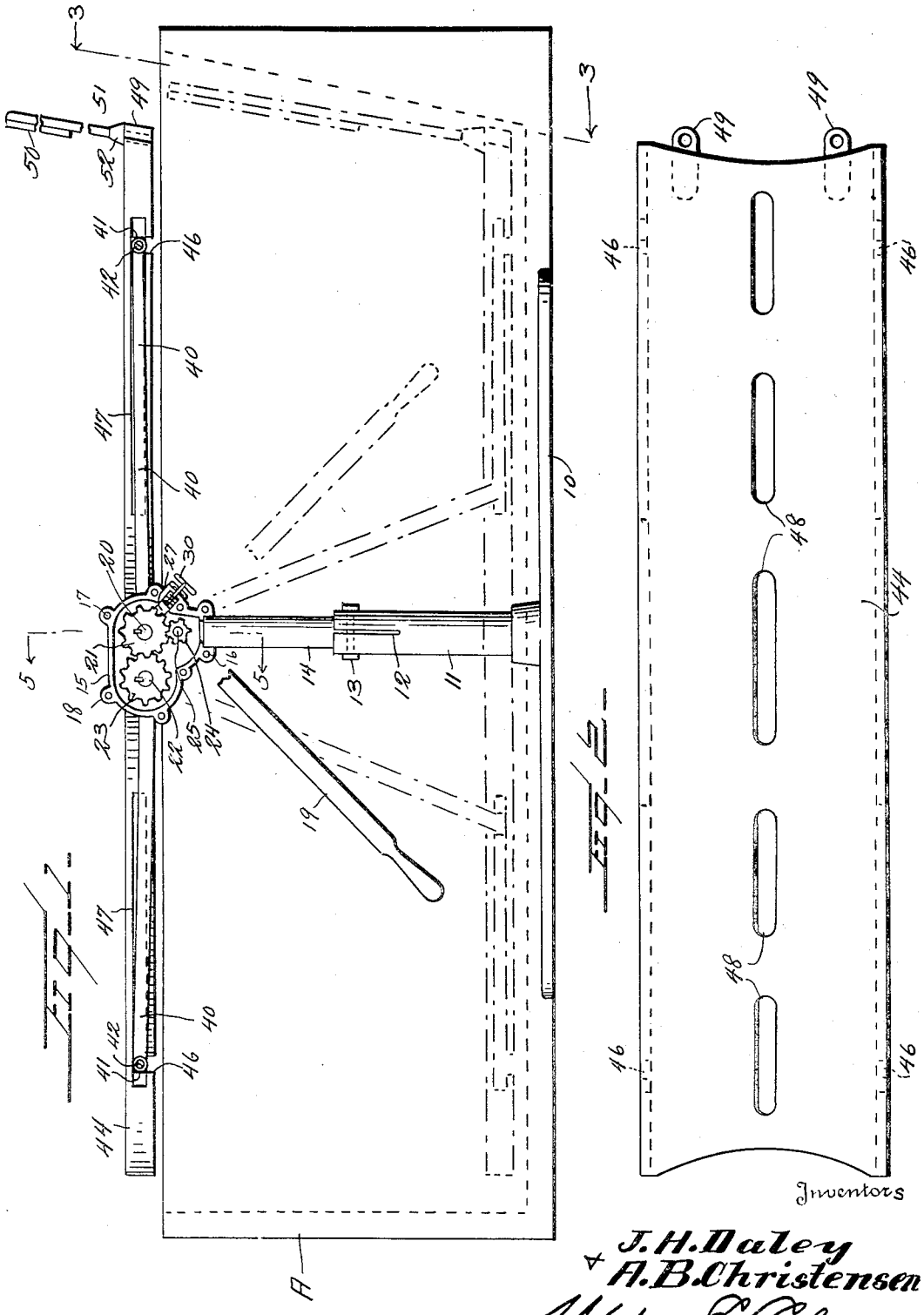
Nov. 7, 1933. J. H. DALEY ET AL 1,934,117

INVALID HANDLING APPLIANCE FOR BATHTUBS

Filed May 19, 1932 3 Sheets-Sheet 1



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Filed May 19, 1932 3 Sheets-Sheet 2

Fig. 3.

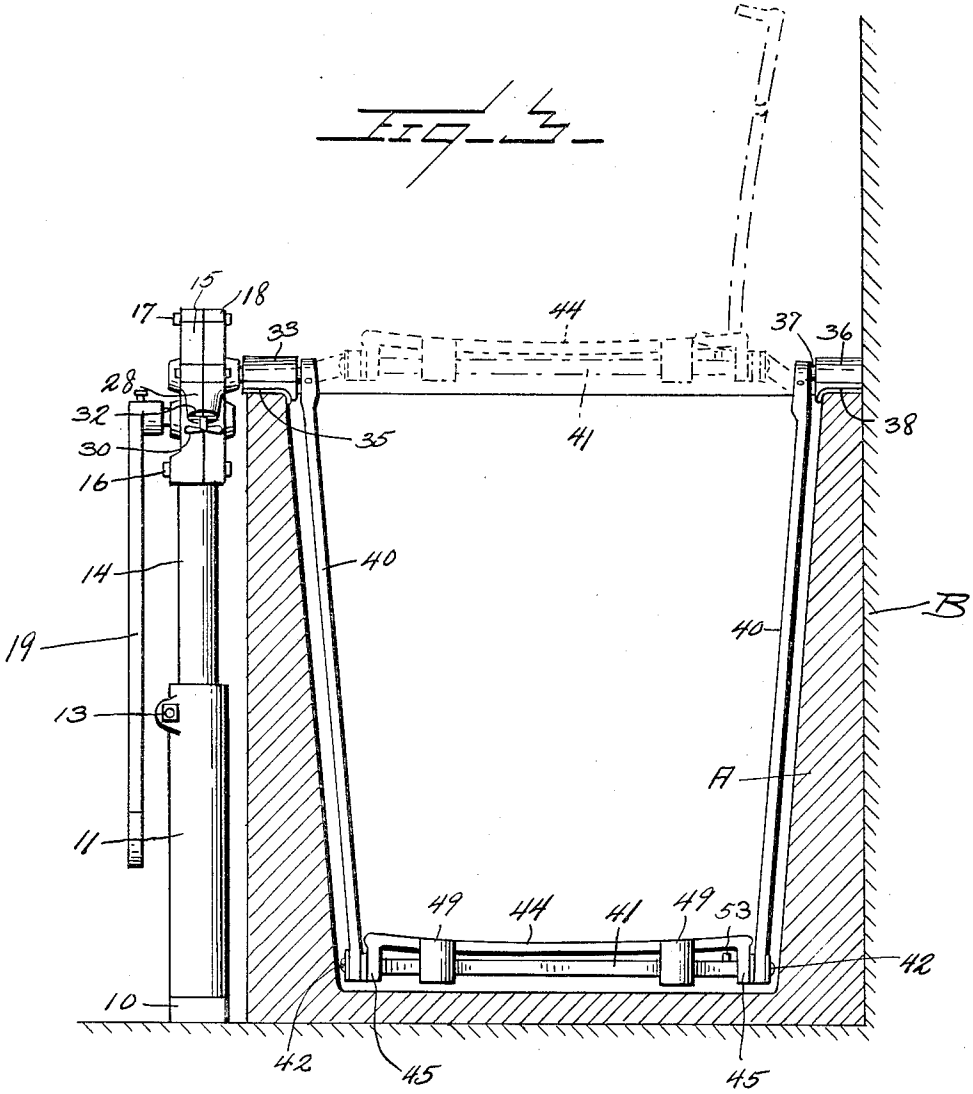
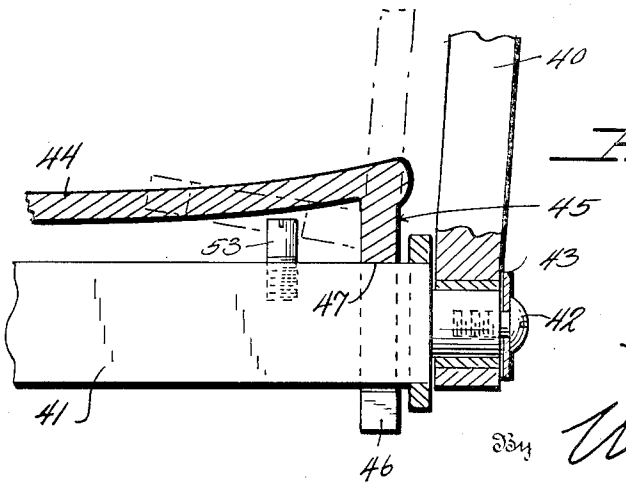


Fig. 4.



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Filed May 19, 1932 3 Sheets-Sheet 3

Fig. 5.

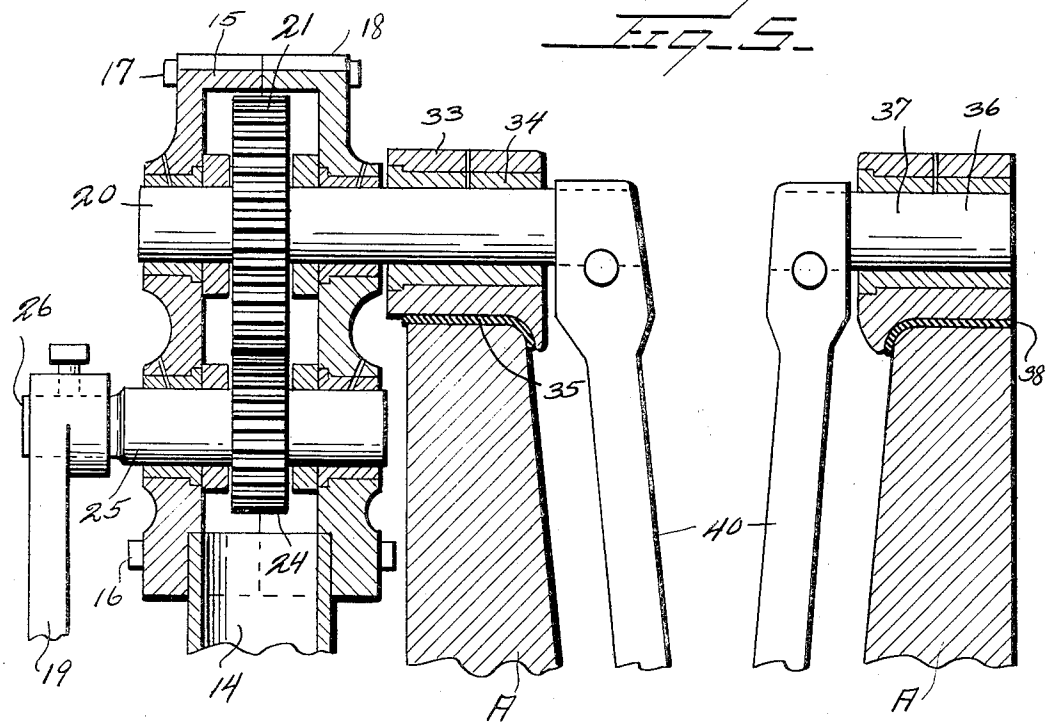


Fig. 6.

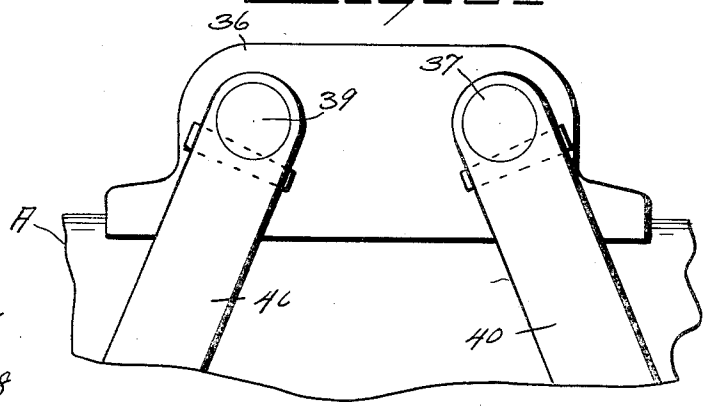
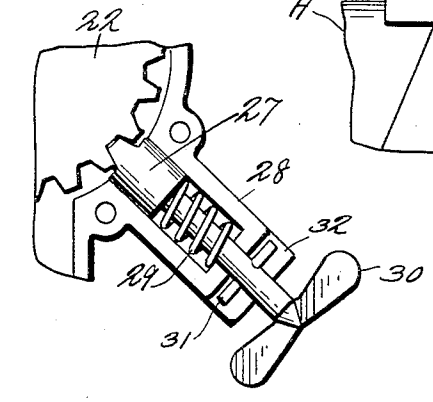


Fig. 7.



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UNITED STATES PATENT OFFICE

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INVALID HANDLING APPLIANCE FOR BATHTUBS

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Application May 19, 1932. Serial No. 612,360

11 Claims. (Cl. 4—185)

This invention relates to devices for raising or lowering invalids and particularly paralytics into or out of bath tubs. Ordinarily paralytics and other invalids when being bathed are handled by hand. In lifting the patient, especially a paralytic, into a bath tub, there is always more or less danger of the patient slipping or falling as the tub is wet and the patient's body is slippery and the patient is absolutely helpless. The patient knowing that he is helpless has a fear of falling and this makes him even harder to handle and this fear does him injury. The nurse or nurses who are handling the patient are also in danger. They are obliged to support all of the weight of the patient in front of them while raising or lowering the patient in or out of the tub. In doing this, they have to strain all their muscles to keep from slipping and prevent the patient from falling. Under these circumstances, they are liable to rupture.

The mechanism which forms the subject-matter of this application provides means whereby a patient may be lowered into a bath tub or raised, which entirely does away with the dangers before referred to, which is sanitary, readily kept cleaned and which is easy to install or remove and simple to operate.

A further object of the invention is to provide a structure of this character which is supported when in place upon the walls of the bath tub but which is operated from a point exterior to the bath tub by a lever or crank, the structure being preferably such that a pawl is provided whereby the operator may lock the body support in any desired elevation within the tub.

A further object is to provide a device of this character which includes two crank arms and a tray or body support with which the crank arms slidingly engage, the gearing of these crank arms being such that as the operator rotates the gearing, the crank arms will be evenly lowered at the same rate of speed or evenly raised, thus preventing the lifting of one end of the tray or support faster than the other end.

A further object is to so connect the tray to the crank arms that when the crank arms have been lifted to a horizontal position and the tray has been lifted to a point slightly above the tub, the tray may be laterally tilted so as to permit it to be cleaned both as regards its upper and its under side.

A further object is to provide a device of this character which may be readily adjusted to fit tubs of different heights and also another object is to provide a detachable back rest in connection with the tray so that under certain circumstances, the back of the patient may be supported.

Other objects will appear in the course of the following description.

Our invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a bath tub, with my bath appliance disposed in position with relation thereto and with the tray or body support raised, the dotted lines showing the body support lowered, the gear casing being open;

Figure 2 is a top plan view of the body support;

Figure 3 is a section on the line 3—3 of Figure 1 and showing in dotted lines the position of the body support when raised;

Figure 4 is a fragmentary section of the body support adjacent one end thereof and of the crank whereby it is carried;

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

Figure 6 is a fragmentary inside elevation of the inner ends of the crank arms and the bearing therefor;

Figure 7 is a detailed elevation of the locking pawl and its coacting mechanism.

Referring to these drawings, A designates a tub of any suitable character and B a wall against which the tub is assumed to be disposed as ordinarily the case. This tub may be assumed to be the usual enameled bath tub, which tub is ordinarily very slippery, and is quite dangerous to invalids. My bathing appliance comprises a base 10 upon which is mounted the vertically disposed pipe fitting 11 constituting the socket. This pipe fitting is split at 12 and this pipe may be closed by means of the bolt 13. Telescopically engaging in the socket 11 is a vertical post or column 14 to the upper end of which is clamped the two-part gear housing 15. This is clamped in place upon the column by means of the bolts 16 and the two parts of the housing are engaged with each other by means of the bolts 17, through ears 18.

Having one end extending into this housing is a shaft 20 carrying upon it the gear wheel 21. Also mounted within this housing upon a shaft 22 is a coacting gear wheel 23 whose teeth mesh with the teeth of the gear wheel 21. Therefore, when the gear wheel 21 is rotated, the gear 23 will rotate in the reverse direction.

Meshing with the gear wheel 21 is a pinion 24, the shaft 25 of which is provided with a many-sided head 26 with which a crank may be engaged, though preferably an operative lever 19 is

adapted to be engaged with this many-sided head. Operating in connection with the gear wheel 21 is a pawl 27 operating within a barrel 28 formed as part of the gear casing and urged outward by a spring 29. This pawl is provided with a handle 30 whereby the pawl may be withdrawn from engagement with the teeth on the wheel 21 against the action of the spring 27. A pin 31 passes through the stem of the pawl and ordinarily fits within a slot 32 formed in the end of the barrel 28. When the handle 30 is retracted and rotated, this pin will rest upon the walls of the slot 32 and thus support the pin out of coactive relation to the teeth of the wheel 21.

The shaft 20 extends laterally out of the gear casing and is disposed within a bearing 33 having a bushing 34, this bearing being formed on its under side to fit over the upper edge of the wall of the tub, there being a protective rubber pad 35 disposed immediately between said bearing and the tub. Immediately opposite the bearing for the shaft 20 is a bearing 36 for a shaft 37. This bearing 36 is designed to fit over the top of the tub, as for instance, over the rear wall thereof and is also provided with the rubber pad or cushion 38.

A shaft 22 passes through the gearing 23 and this shaft is supported in bearings in the same manner as is the shaft 20 while the bearing 36 also supports a shaft 39 opposed to the shaft 22. Thus there are two shafts supported upon the forward wall of the tub, namely 20 and 22 and two shafts supported upon the rear wall of the tub, namely 37 and 39.

Attached to the shaft 20 by being pinned thereto is a crank arm 40. Attached to the shaft 37 is a like crank arm 20, each of these arms 40 being connected at their outer ends by means of a transverse rod 41 which is preferably square in section and being attached to the arms 40 by means of screws 42 and washers 43 or in any other suitable manner. Crank arms 40 are also applied to the shafts 23 and 39, these crank arms being also connected by a transverse rod 41. Thus it will be seen that we have provided two pairs of shafts and two pairs of crank arms connected to the shafts and that as the operating shaft 25 is rotated, the cranks composed of the parts 40 and 41 will be moved in opposite directions but either upward or downward depending upon the direction of rotation of the shaft 25.

The patient is disposed upon the tray, table or body support which is designated generally 44. This is preferably, though not necessarily, formed of enameled sheet metal and as illustrated, this tray has downwardly extending lateral flanges 45. These flanges at their ends are formed with the vertically extending slots 46 which engage over the cross bars 41 of the cranks. Extending from these slots 46, each flange is formed with a pair of horizontally extending slots 47 which extends from the slots 46 inward toward the shafts of the crank arms.

Thus these transverse rods 41 can move horizontally along the slots 47 as the arms are raised or lowered. When the arms are in a horizontal position, the cross bars 41 of these bars will be disposed immediately adjacent the slots 46 and then the tray can be raised entirely off of the crank arms or the tray may be tilted as shown in dotted lines in Figure 3 in either direction. As the crank arms 40 are lowered, the transverse rods 41 will travel inward on the slots 47 so that when the crank arms are fully lowered, as shown in Figure 1, the tray will be supported adjacent the bottom of the tub. The tray is provided with drainage openings 48 so that as the tray is raised, the water will drain off therefrom. Preferably, the tray is slightly dished transversely. The tray might be provided with a rubber covering, if desired, so as to prevent any possible chance of the patient slipping, though this is not necessary.

Preferably, one end of the tray will be formed of the outwardly projecting ears 49 so that a back rest designated generally 50 may be carried upon the ends of the tray or body support. This back rest will be supported by the two supports 51 which extend down below the back rest and are provided with shoulders 52 and below these shoulders are fitted to extend through the ears 49. These ears 49 are relatively thick so that a firm and rigid support will be provided for the shanks of the back rest supports. The back rest may be readily removed, if necessry, or desirable.

It will be seen that my appliance may be readily shifted into position with the bearings on the tub and that under these circumstances, the whole weight of the patient is supported by the arms which in turn are supported by the walls of the tub.

When the crank arms are turned up to a horizontal position, the appliance may be readily withdrawn from engagement with the tub. The telescopic standard composed of the parts 11 and 14 permit this appliance to be adjusted vertically to suit the height of any tub. Obviously, the arms 40 will have a length approximately equivalent or somewhat greater than the depth of any ordinary tub as it is sufficient if the arms are long enough so as to permit the tray or body support to be lowered to the bottom of any ordinary tub. The locking pawl 27 may be utilized to hold the arms at any desired lowered position. Thus these arms need not be fully lowered but only partially lowered so as to only slightly immerse the patient into the tub or to support the patient where he can be readily handled, bathed and washed or otherwise treated.

It will be seen from dotted lines in Figure 3 that the tray, as before stated, can be tilted back to allow cleaning of the tub and allow any water to be discharged from the tray. To be able to tilt the tray, the lifting arms or cranks must be in a horizontal plane. This brings the square bars 40 in alinement with the slots 46 so that the tray is free to be raised on one side or the other or taken off. The front side of the tray may be raised up and then the tray laid back against the wall or other support. While raising the tray, the rear end of the tray slides against the pin or screw 53 extending upward from the bar 41 which answers as a stop. This keeps the tray from slipping.

While we have illustrated certain detailed constructions and arrangements of parts we do not wish to be limited thereto as obviously these might be modified in many ways without departing from the spirit of the invention as defined in the appended claims.

We claim:—

1. The combination with a tub, of a pair of crank arms disposed over the tub and when raised to a horizontal position extending in opposite directions, bearings for the arms mounted upon the side walls of the tub, a body support operatively carried by the crank arms and with which the crank arms have sliding engagement, and means operable from the exterior of the tub whereby both crank arms may be simultaneously

shifted downward or raised to lower or raise the body support.

2. The combination with a tub, of two sets of cranks, each including a pair of crank arms and a cross bar, means for supporting said cranks upon the walls of the tub, manually operable means for simultaneously shifting both sets of cranks rotatably in opposite directions to lower them into the tub or raise them therefrom, and a body support carried by said cross bars of the crank arms and with which the crank arms have sliding engagement.

3. The combination with a tub, of two sets of cranks, each including a pair of crank arms and a cross bar, means for supporting said cranks upon the walls of the tub, manually operable means for shifting said cranks rotatable in opposite directions to lower them into the tub or raise them therefrom, and a body support carried by said cross bars of the crank arms, the body support having lateral flanges formed with longitudinally extending slots receiving the cross bars of the cranks.

4. The combination with a tub, of two sets of cranks, each including a pair of crank arms and a cross bar, means for supporting said cranks upon the walls of the tub, manually operable means for shifting said cranks rotatable in opposite directions to lower them into the tub or raise them therefrom, and a body support carried by said cross bars of the crank arms, the body support having lateral flanges formed with longitudinally extending slots receiving the cross bars of the cranks, the outer ends of the slots intersecting vertical slots in the flanges whereby the body support may be lifted from the cross bars or tilted thereon.

5. The combination with a tub, of a pair of cranks, bearings supported upon the opposite walls of the tub and supporting said cranks, intermeshing gears engaged with said cranks, manually operable means for rotating said gears, and a body support carried by both of said cranks and lowerable into the tub by a rotation of the cranks in opposite directions.

6. The combination with a tub, of opposed bearings mounted upon the walls of the tub, a pair of cranks having shafts supported in said bearings, the outer end of the outer shafts having gear wheels intermeshing with each other, a gear housing for said gear wheels, a pinion in the housing engaging one of said gear wheels, means exteriorly of the housing whereby the pinion may be operated, and means for locking the gear wheels from operation in any position.

7. The combination with a tub, of opposed bearings mounted upon the walls of the tub, a pair of cranks having shafts supported in said bearings, the outer end of the outer shafts having gear wheels intermeshing with each other, a gear housing for said gear wheels, a pinion in the housing engaging one of said gear wheels, means exteriorly of the housing whereby the pinion may be operated, means for locking the gear wheels from operation in any position, and a vertically adjustable column supporting said housing.

8. The combination with a tub, of opposed bearings mounted upon the walls of the tub, a pair of cranks having shafts supported in said bearings, the outer end of the outer shafts having gear wheels intermeshing with each other, a gear housing for said gear wheels, a pinion in the housing engaging one of said gear wheels, means exteriorly of the housing whereby the pinion may be operated, means for locking the gear wheels from operation in any position, and a vertically adjustable column supporting said housing comprising two telescopic sections, showing one of said sections constituting a floor engaging base, and means for locking said sections in adjusted positions.

9. The combination with a tub, of opposite disposed bearings mounted upon the side walls of the tub, cushions disposed between said bearings and the upper faces of the side walls of the tub, a pair of cranks having shafts engaging in said bearings, a body support carried by said cranks, and raisable or lowerable therewith, gearing engaged with said shafts and causing the unitary rotation of the crank arms in opposite directions, and manually operable means for operating said gearing.

10. A bathing appliance comprising opposed bearings adapted to rest upon the top of a tub, cranks including crank arms and transverse bars connecting said arms, and shafts supported in said bearings, a gear housing into which the outer ends of the outer shafts project and having bearings for said shafts, intermeshing gear wheels mounted on the shafts, a pinion disposed within the crank housing and engaging one of said gear wheels, means on the shaft of said pinion whereby it may be rotated, means for locking the gear wheels in any rotated positions, and a body support having lateral flanges, each of said flanges being formed with a longitudinally extending slot and at their outer ends with a vertical slot intersecting the longitudinal slot, said slots receiving the cross bars of the cranks, said body support having drainage openings.

11. A bathing appliance comprising opposed bearings adapted to rest upon the top of a tub, cranks including crank arms and transverse bars connecting said arms, and shafts supported in said bearings, a gear housing into which the outer ends of the outer shafts project and having bearings for said shafts, intermeshing gear wheels mounted on the shafts, a pinion disposed within the crank housing and engaging one of said gear wheels, means on the shaft of said pinion whereby it may be rotated, means for locking the gear wheels in any rotated positions, and a body support having lateral flanges, each of said flanges being formed with a longitudinally extending slot and at their outer ends with a vertical slot intersecting the longitudinal slot, said slots receiving the cross bars of the cranks, said body support having drainage openings, one end of the body support having sockets and a back rest having supporting members insertable into said sockets or removable therefrom.

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