

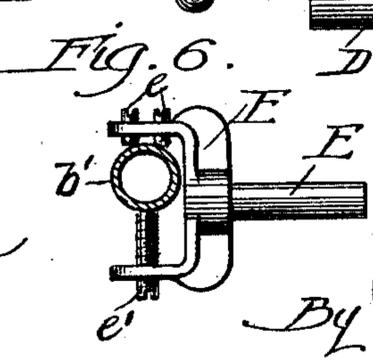
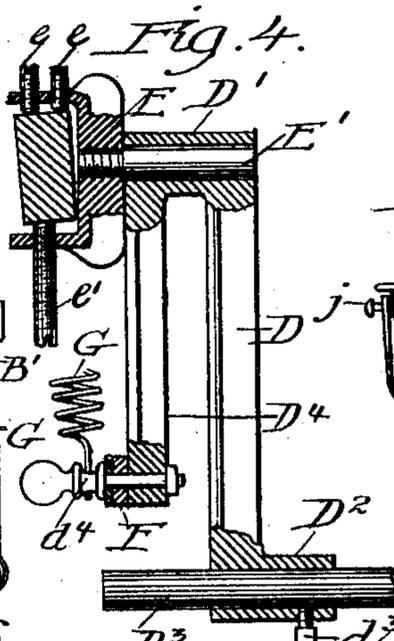
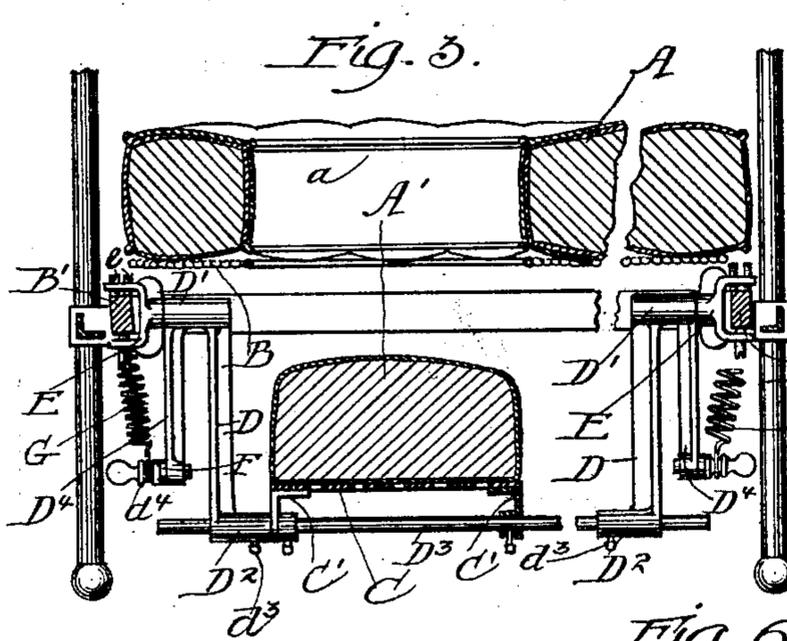
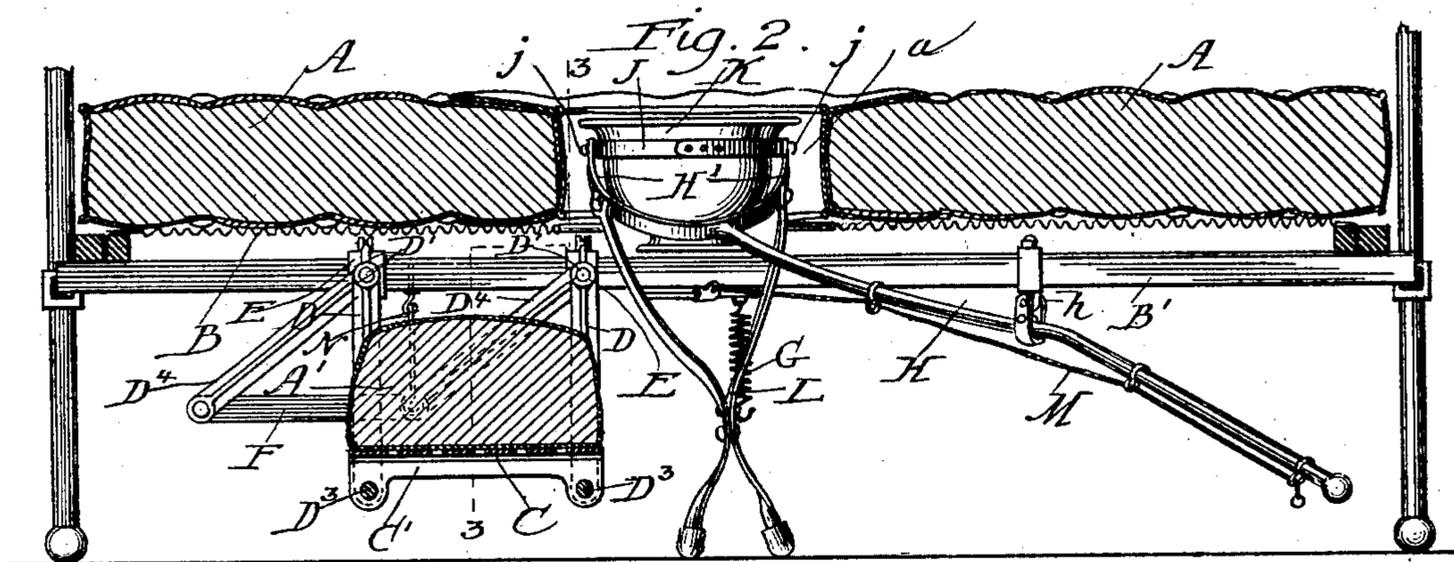
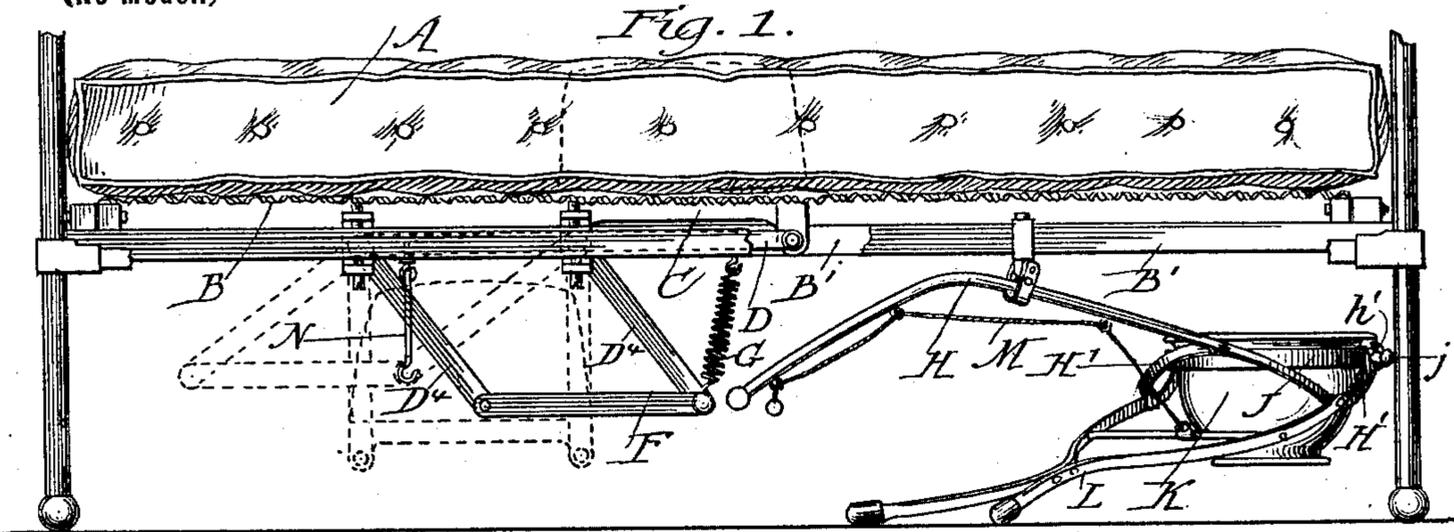
No. 686,831.

Patented Nov. 19, 1901.

W. A. NASON.  
INVALID BED.

(Application filed Jan. 30, 1901.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

WILLIAM A. NASON, OF ALGONQUIN, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
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## INVALID-BED.

SPECIFICATION forming part of Letters Patent No. 686,831, dated November 19, 1901.

Application filed January 30, 1901. Serial No. 45,282. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. NASON, a citizen of the United States, residing at Algonquin, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Invalid-Beds, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

10 The purpose of this invention is to provide an invalid-bed with improved means for accommodating a bedridden patient and permitting surgical attention to such patient without the use of bed-pans or like appliances, which are otherwise necessary.

15 The invention consists of new and simplified means for operating a plug or closure in a mattress-aperture and for upholding a vessel in such aperture and withdrawing the same without disturbing the patient and of specific details of construction, which are set out in the claims.

25 In the drawings, Figure 1 is a side elevation of an invalid-bed having my invention, the mattress-plug being shown in the aperture of the mattress and the vessel-carrier and vessel being out of operation. Fig. 2 is a longitudinal section showing the mattress-plug withdrawn and the vessel held in operative position by the carrier. Fig. 3 is a transverse section at the line 3 3 on Fig. 2 omitting the vessel and carrier. Fig. 4 is a partly-sectional detail elevation of the crank-shaft structure, each pivotal bearing or junction being shown in axial section. Fig. 5 is a side elevation of a modified vessel-carrier. Fig. 6 is a detail elevation showing the pivot-bearing clamp applied to a cylindrical rail.

30 A is a mattress having an aperture *a*, adapted to be occupied by the plug *A'*.

35 B represents the mattress-support, which is shown as a common form of woven-wire spring having an aperture corresponding to that of the mattress.

40 B' B' are the side rails of the mattress-supporting spring.

45 C is a support for the plug *A'*, which is preferably made of perforated sheet metal rendered more rigid longitudinally by angle-iron bars *C' C'*, the whole structure consist-

ing of said plate and bars, constituting a flat link which connects the wrists of cranked shafts, hereinafter described, by which the plug is operated. For convenience of construction and adaptation to beds of different widths and having the aperture at different positions in the width I have shown these cranked shafts as made up of adjustable parts. The description of one of the cranked shafts will suffice for both. Each shaft consists of two crank elements *D D*, which at one end are adapted to be journaled in line on opposite sides of the bed, the boss or hub *D'* of each element constituting or representing the shaft proper, the boss *D<sup>2</sup>* at the opposite end being apertured parallel to the shaft-axis to receive the adjustable wrist *D<sup>3</sup>*. Such wrist is a rod whose length is substantially the width of the narrowest bed to which the device may be applied, the range of adjustment which it may have in and through the boss *D<sup>2</sup>* being from a short engagement sufficient to permit it to be secured by the set-screw *d<sup>3</sup>* to a maximum protrusion through the boss which may be not farther than the end of the boss *D'*, this range of adjustment being at least half the difference between the width of the narrowest and widest bed to which said device may be applied, so that by utilizing such adjustment at both ends the device may be accommodated to beds from the widest to the narrowest. For the purpose of journaling the shafts at the hubs *D' D'* on suitable supports I provide clips *E E*, &c., adapted to be clamped onto the side rails of the bed or mattress-supporting spring, such clips having an inwardly-jutting stud *E'*, which enters the axial aperture in the boss *D'*, and so journals the crank-shaft. Depending flanges of the angle-irons which stiffen the plug-supporting perforated plate are apertured to receive the crank-wrists, and two clips *E E* are mounted on each side rail of the mattress-supporting spring at the same distance apart as the apertures for the crank-wrists in said plug-supporting link, the corresponding clips on opposite side rails being of course mounted with the studs *E'*, which constitute the journal-bearings of the cranked shafts, in line,

respectively, and the four clips being mounted at such position on the rails with respect to the position of the aperture in the mattress-support and mattress that when the cranked shafts thus constituted are rocked to swing up the plug supported on the link C said plug may enter and occupy the aperture. In order to make it practicable to get the opposite studs  $E' E'$  in line, notwithstanding the fact that the side rails  $B'$  when of wood are frequently warped and twisted more or less, I employ two screws  $e e$  in one of the fork-arms of the clip  $E$ , which may be set so as to protrude different distances and impinge on the rail and bind the clip to it, with the studs projecting at the proper line. Only one screw  $e'$  need be used in the other fork-arm of the clip. This feature of construction is shown in Fig. 4. The same expedient adapts the clip for fastening to a tubular side bar  $b'$ , as seen in Fig. 6. In order to operate the cranked shaft, and thus carry the plug into and out of place, it is convenient to provide lever-arms for the rock-shafts other than the cranks, and since these lever-arms—or one, at least—should be conveniently near the side of the bed and must be rigid with the shaft it is most convenient to form each of the cranks with such a lever-arm in addition to the crank proper, to which the wrist is attached, and I have shown the fitting which constitutes the crank made with such a lever-arm  $D^4$  rigid and integral with it. Such lever-arm for the purpose indicated preferably extends obliquely downward from the axis of the rock-shaft when the crank-arm is extended horizontally to uphold the plug, so that it is at an angle of from forty-five degrees to sixty degrees with the crank. Inasmuch as the mattress as a whole is usually provided with a spring-support, as shown, and yields to the weight of the patient, it is important that the plug should be made similarly yielding when it is in position in the mattress-aperture, and in order to effect this result, since the plug is positively upheld by the cranked shafts described, these cranked shafts must in some manner be arranged to yield to any weight operating on the plug substantially as much as the mattress as a whole yields under the same pressure. For this purpose I provide an extensible coiled spring  $G$ , which may be hooked onto the side rail of the mattress-supporting spring and at its lower end hooked onto a lever-arm  $D^4$ , which may be provided with a sidewardly-jutting stud  $d^4$  for that purpose. The spring should be disengageable at one end or the other in order to permit the rock-shaft to be operated to withdraw the plug. Most conveniently the spring is made to be disengaged from the lever, being left suspended from the rail, and a hook  $N$ , depending from the rail, engages the stud to hold the plug out of the way of the vessel.

Since the cranks  $D D$  are substantially hori-

zontal and so are all in one plane and that the same plane as the link  $C$  when the plug is fully elevated, it is desirable to provide other connection between the two cranked shafts which shall be in a different plane at that stage. This is conveniently effected by providing a link  $F$ , connecting the lever-arms  $D^4$  at either side of the bed, such link being in length between centers of the pivotal connection equal to the distance between centers of the shaft journal-bearings  $E' E'$ , so that the link maintains at all stages a position parallel with the link  $C$  and the plug thereon and prevents any unequal rocking of the two shafts, which would cause or permit the plug to become otherwise than horizontal.

For the purpose of handling a vessel to accommodate the patient in lieu of bed-pan and for lifting it up into and holding it securely in the mattress-aperture and for withdrawing it and carrying it out from under the bed I provide a lever  $H$ , fulcrumed at the universal joint  $h$  upon any fixed support, as upon the side rail of the mattress-supporting spring. This lever has one end extending out beyond the bed for convenience of operating, and the opposite end is bifurcated. The fork-arms  $H' H'$  have upwardly-open notches  $h' h'$ , which afford lodgment for the trunnions  $j j$ , with which the vessel  $K$  is provided, the provision for such trunnions being preferably made, as illustrated, by fixing them to the flexible strap  $J$ , which is buckled or otherwise secured around the vessel, as near the upper margin as convenient. In lieu of this expedient a basket or sling  $J'$  may be provided to hold the vessel, the trunnions  $j$  being fixed on the upper band  $J^{10}$  of such basket or sling. (See Fig. 5.) It will be seen that the vessel is suitably hung in the fork-arms while the lever is in position to permit this to be done conveniently and that the lever may then be operated to carry the vessel around under the bed and up into the aperture in the mattress. In order to dispense with the necessity for holding the vessel in place during use, as might be done, I provide a poke or stilt  $L$ , pivoted to the lever as near the point of support of the vessel thereon as convenient and of such length that when the foot of the stilt is on the floor, the vessel being upheld in the aperture of the mattress, the stilt is slightly inclined. With this construction when the attendant by depressing the outer end of the lever forces the vessel up firmly against the patient the poke or stilt assuming less and less inclined position as the vessel is elevated locks it up in the position to which it is thus lifted and holds it firmly. In order to lower the vessel notwithstanding this locking device, I connect to the stilt a cord or cable  $M$ , which runs through suitable guide-eyes on the lever and extends down to a convenient position, where it may be pulled by the operator while holding the lever-handle, thus lifting one foot of the stilt from the floor and

permitting the vessel to be lowered and swung out. The best position for pivoting the stilt is as near as possible to the trunnion-bearings, and I have therefore shown the stilt as  
 5 forked at the upper end and spanning the vessel beneath its fork, being pivoted to the lever fork-arms, respectively, directly under the trunnion-bearings. It is also of some advantage to provide the stilt with more than  
 10 a single foot, and particularly to provide it with two feet spread transversely to the length of the lever, and I have so shown it.

I claim—

1. In an invalid-bed, in combination with  
 15 an apertured mattress and its support correspondingly apertured, a pad adapted to serve as a plug to occupy the mattress-aperture, and a carrier for the same consisting of two cranked shafts having their journal-bearings  
 20 fixed with respect to the mattress-support, the plug being pivotally mounted on the wrists or offset portions of the cranked shafts, and means for rocking one of such shafts and for locking the shafts in position in which  
 25 they hold the plug in the aperture of the mattress.

2. In an invalid-bed, in combination with an apertured mattress and its support, correspondingly apertured, a pad adapted to  
 30 serve as a plug to occupy the mattress-aperture; a carrier for the same, comprising two cranked shafts, on whose wrists or offset portions the mattress-plug is pivotally mounted, and a link connecting the corresponding  
 35 crank-arms of such cranked shafts, to cause the rocking movement of either shaft to be communicated to the other, and means for locking the shafts in position at which they hold the plug in the mattress-aperture.

3. In an invalid-bed, in combination with  
 40 an apertured mattress and its support having a corresponding aperture, two shafts having their journal-bearings fixed with respect to the mattress-support at opposite sides of the  
 45 bed, and cranked or offset intermediate their respective bearings, a plug, adapted to occupy the mattress-aperture, pivotally mounted on such offset portions so as to hold said portions apart a distance equal to the distance between  
 50 the shafts, whereby the crank-arms operate in the rocking of the shaft to carry the plug with a parallel motion down out of and horizontally away from the aperture.

4. In an invalid-bed, in combination with  
 55 an apertured mattress and a support for the same correspondingly apertured, two parallel shafts journaled under the bed and offset intermediate their bearings forming parallel crank-wrists, a link connecting said wrists,  
 60 and a plug mounted on such link, adapted to occupy the mattress-aperture, and a spring for upholding the plug in the aperture.

5. In an invalid-bed, in combination with  
 65 an apertured mattress and a support for the same correspondingly apertured, two parallel shafts journaled under the bed and offset in-

intermediate their bearings forming parallel crank-wrists, a link connecting said wrists, and a plug mounted on such link, adapted to occupy the mattress-aperture, and a disen-  
 70 gageable spring for upholding the plug in the aperture.

6. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, two parallel  
 75 shafts having their journal-bearings fixed with respect to the mattress-support at opposite sides of the aperture, such shafts being cranked or offset intermediate their bearings, and a perforated plate pivotally connected to  
 80 the cranks or offset portions and operating as a link to connect the same, and a plug mounted on such perforated plate, adapted to occupy the mattress-aperture, and means for upholding the cranks to hold the plug in the  
 85 aperture.

7. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, two parallel  
 90 shafts having journal-bearings fixed with respect to the mattress-support, both shafts extending across the bed beyond the aperture toward the same end of the bed, such shafts being cranked or offset intermediate their  
 95 bearings; a link connecting their crank-wrists or offset portions, and a plug mounted on such link adapted to occupy the mattress-aperture when said shafts are rocked to swing the cranks toward the aperture; and means for upholding their said crank-wrists at such po-  
 100 sitions.

8. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, two shafts  
 105 extending across the bed underneath the mattress-support and cranked or offset at a position corresponding to that of the aperture; said shafts having lever-arms located near one side of the bed; and a link connecting said  
 110 lever-arms, whose length is substantially equal to the distance between the shafts; and a plug adapted to occupy the mattress-aperture, mounted on the wrists or offset portions of the crank-shafts and carried thereby as  
 115 the shafts rock up into and down out of the mattress-aperture.

9. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, two parallel  
 120 shafts extending across the bed and cranked or offset intermediate their ends at a position corresponding to that of the aperture, a link connecting the wrists or offset portions, substantially equal in length to the distance be-  
 125 tween the shafts; and a plug supported on such link, adapted to occupy the mattress-aperture; one of the shafts having a lever-arm toward one end; and a spring connected to the bed and to said lever-arm to uphold  
 130 the plug in the mattress, and disengageable at one of said engagements to permit the plug to be lowered by rocking said shafts.

10. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, two cranked shafts comprising cranks and lever-arms, each apertured at one end to receive the wrist portion of the crank-shaft and adapted at the other end to be journaled parallel to such wrists; clips adapted to be secured to the side rails of the bed or mattress support, and having suitable journal-bearings for said cranks; the crank-wrist portions consisting of rods adjustably extended through such apertures, and means for securing them therein; and a plug adapted to occupy the mattress-aperture, mounted on such wrists, and suitable means for spacing the wrists a distance substantially equal to the distance between the journal-bearings of the cranks on the clips.

11. In an invalid-bed, in combination with an apertured mattress and its support, the cranked rock-shafts and the plug carried thereby into the mattress-aperture, clips having journal-bearings for the cranked shafts, adapted to be secured to the side rails of the bed or mattress support, and for that purpose comprising lateral projections adapted to extend above and below the rail; set-screws set through such projections, to impinge upon the rail above and below the same, one of such projections having two set-screws in positions to impinge upon the rail at different points in its width, whereby the clip may be adjusted to vary the direction of the axis of the journal-bearings, so that opposite journal-bearings may be adjusted in line.

12. In an invalid-bed, in combination with an apertured mattress and a support, correspondingly apertured, a vessel adapted to be inserted into the aperture having trunnions at opposite sides, a lever and a universal joint by means of which it is pivoted on the bed or mattress support, such lever having a forked terminal whose fork-arms afford pivotal trunnions for the vessel.

13. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, a vessel adapted to be entered in the aperture and provided with opposite trunnions, a lever fulcrumed on the bed or mattress support, and having forked terminal whose fork-arms afford pivotal bearings for the trunnions of the vessel, and a poke or stilt pivoted to the lever and adapted to rest upon the floor in slightly-inclined position when the vessel is inserted in the aperture of the mattress, whereby such poke or stilt serves to uphold the vessel at varying heights within a limited range of adjustment.

14. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, a vessel adapted to be entered in the aperture and provided with opposite trunnions, a lever fulcrumed on the bed or mattress support, and

having forked terminal whose fork-arms afford pivotal bearings for the trunnions of the vessel, and a poke or stilt pivoted to the lever and terminating at the lower end in two feet, spread transversely to the direction of the lever, such poke or stilt being of such length as to stand slightly inclined when the vessel is upheld in the aperture of the mattress.

15. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, a vessel adapted to be entered in the aperture and provided with opposite trunnions, a lever fulcrumed on the bed or mattress support, and having forked terminal whose fork-arms afford pivotal bearings for the trunnions of the vessel, and a poke or stilt bifurcated at the upper end to span the vessel from below, and having its arms pivoted to the fork-arms of the lever respectively, and of such length as to stand slightly inclined when the vessel is upheld in the aperture of the mattress.

16. In combination with an apertured mattress and a support for the same correspondingly apertured, a vessel adapted to enter the aperture having opposite trunnions; a lever fulcrumed on the bed or mattress support and bifurcated at one end, and having its fork-arms provided with notches open in direction to afford lodgment for the vessel-trunnions; said lever having universal-joint connection at its fulcrum, whereby it is adapted to carry the vessel up into the aperture and down out of the same, and thence laterally from under the bed.

17. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, a vessel adapted to enter the aperture and provided with opposite trunnions; a forked lever having its fork-arms provided with bearings for the trunnions, said lever being fulcrumed on the bed or mattress support; a poke or stilt pivoted to the lever and adapted to rest its foot upon the floor and stand slightly inclined when the vessel is upheld in the aperture, and connection from the said stilt, suitably guided on the lever, by which the foot of the stilt may be lifted to permit the vessel to be lowered.

18. In an invalid-bed, in combination with an apertured mattress and a support for the same, correspondingly apertured, a plug for closing the aperture and means for operating the plug to insert and withdraw it, consisting of parallel cranked shafts journaled underneath the mattress-support, having the plug mounted on the crank-wrists or offset portions, such wrists consisting of rods adjustably secured in the crank-arms, to permit the latter to be spread and approached to adapt the structure to beds of different widths.

19. In an invalid-bed, in combination with an apertured mattress and a support for the same correspondingly apertured, a plug for closing the aperture, and means for operating

the plug to insert and withdraw it, consisting  
of parallel cranked shafts journaled under-  
neath the mattress-support; a link connect-  
ing the wrists or offset portions, and arranged  
5 to carry the plug, such link being laterally  
movable on the crank-wrist, and adjustable  
stops on the wrist to retain it as adjusted.

In testimony whereof I have hereunto set

my name, at Chicago, Illinois, in the presence  
of two witnesses, this 25th day of January, 10  
A. D. 1901.

WILLIAM A. NASON.

In presence of—

LYDIA A. GOODSON,  
CHARLES C. NASON.