No. 633,051. Patented Sept. 12, 1899.

F. SPICER & W. SNYDER.

APPARATUS FOR RAISING OR LOWERING INVALIDS.

(Application filed Jan. 3, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

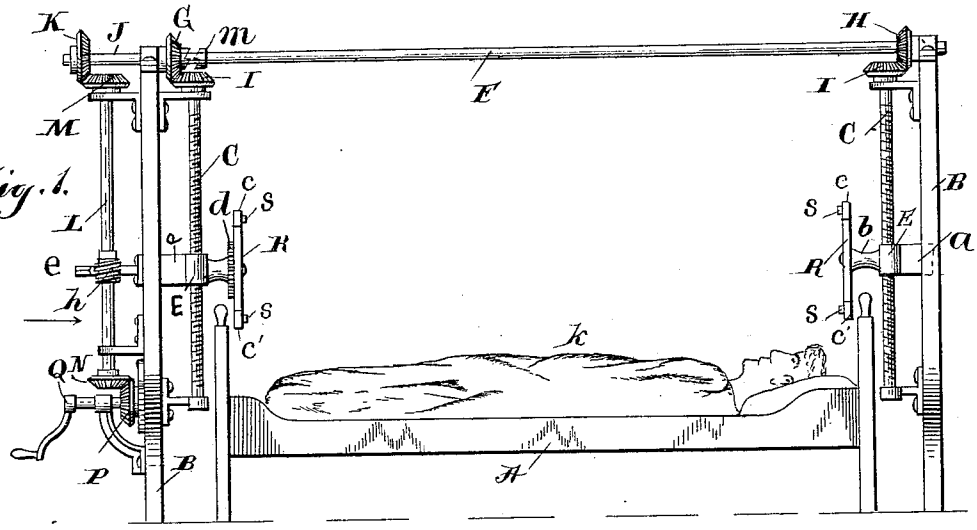


Fig. 2.

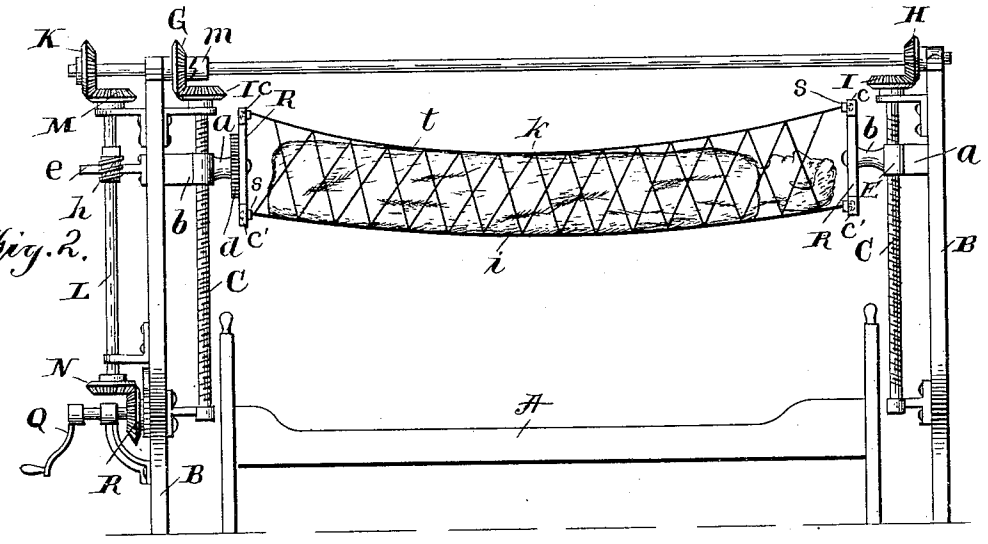
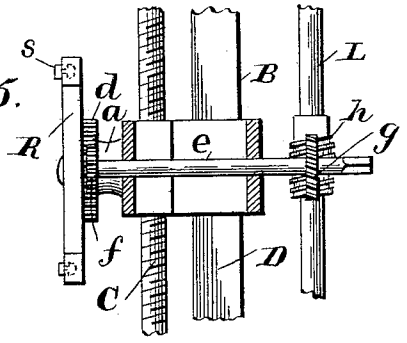


Fig. 5.



Witnesses
Geo. E. Fuch.
Chas. R. Wright Jr.

Inventors
Frank Spicer
William Snyder
by A. S. Pattison
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 3.

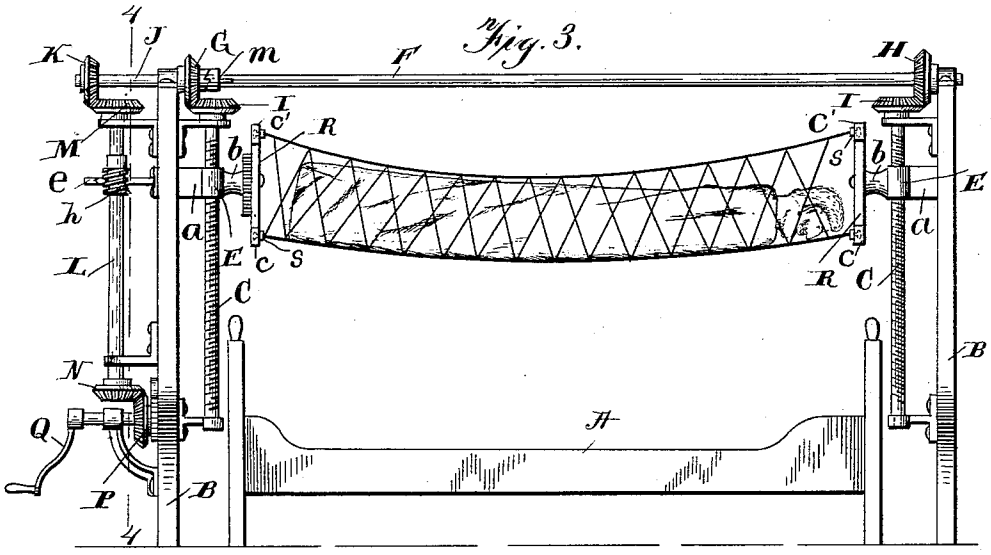


Fig. 4.

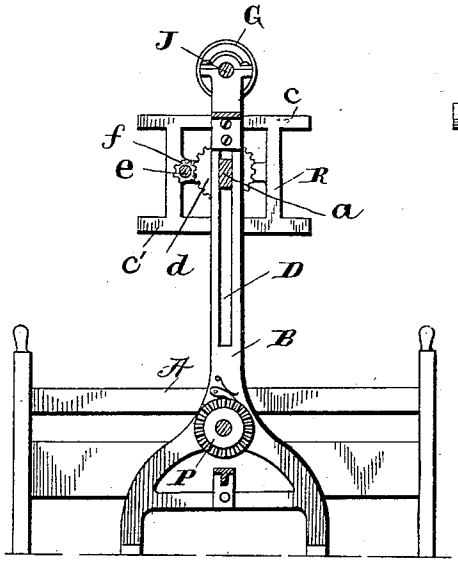
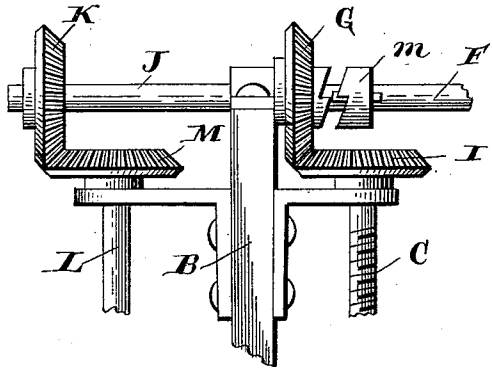


Fig. 6



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Chas. R. Wright Jr.

Inventors
Frank Spicer,
William Snyder,
by A. S. Pattison Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK SPICER AND WILLIAM SNYDER, OF LANCASTER, PENNSYLVANIA.

APPARATUS FOR RAISING OR LOWERING INVALIDS.

SPECIFICATION forming part of Letters Patent No. 633,051, dated September 12, 1899.

Application filed January 3, 1899. Serial No. 701,002. (No model.)

To all whom it may concern:

Be it known that we, FRANK SPICER and WILLIAM SNYDER, citizens of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Apparatus for Raising or Lowering Invalids, of which the following is a specification.

Our invention relates to improvements in an apparatus for raising and lowering invalids, and pertains to a construction whereby the invalid may be raised bodily from the bedstead and the bedclothing renewed or whereby the head of the invalid may be raised while he is lying upon the bed, all of which will be fully described hereinafter and particularly pointed out in the claims.

The object of our invention is to provide an apparatus adapted to be used in connection with a bedstead of any style whatever and by means of which the invalid may be raised bodily from the bedstead and turned so that the bedclothing may be removed and clean bedding placed thereon and then replaced upon the bed with but little or no exertion on the part of the operator, and the whole apparatus adapted to be actuated by one person, the same also being constructed to permit of the raising of the head of the invalid while he is lying upon the bed, if desired.

In the accompanying drawings, Figure 1 is a side elevation of our invention, showing it used in connection with a bedstead and the invalid in bed. Fig. 2 is a side elevation of the same, showing the invalid elevated together with the bedclothing and ready to be turned for the purpose of removing the bedclothing from under him and placing clean bedding in its place. Fig. 3 is a view showing the invalid turned for the purpose of enabling the clothing to be removed and clean clothing put in its place. Fig. 4 is a vertical section taken on the dotted line 4 4 of Fig. 3. Fig. 5 is a detail view of the raising and turning members. Fig. 6 is an enlarged detail of the upper end of the operating-shaft, showing a clutch for throwing one of the wheels out of engagement with the main operating-shaft.

In the drawings, A is a bedstead, which may be of any form or style and with which our invention is used. The mechanism has no connection whatever with the bed and the bed, as stated, may be of any form, shape, or size which is adapted to be placed between the elevating mechanism to be now described.

B are posts or standards situated outside of each end of the bed, and journaled to the inner sides of these standards are the vertical screw-threaded shafts C. The standards B are provided with vertical ways or slots D, and upon the shafts C are situated the internally-screw-threaded sockets E. These sockets are provided with outwardly-projecting arms *a*, which move in the ways or slots D of the standards B.

Journaled at the upper ends of the standards is a shaft F, which extends longitudinally of the bed A, the shaft having at each end and inside of the standards B the bevel-gears G and H, which are adapted to intermesh with the bevel-gears I, attached to the upper ends of the screw-threaded shafts C. One end of this shaft F projects outside of one of the standards B, as shown at J, and carries a bevel-gear K.

Journaled to the outer side of the standards B, adjacent the projecting end J of the shaft F, is a vertical operating-shaft L, carrying at its upper end a bevel-gear M, which meshes with the gear K upon the projecting end of the shaft F, as clearly illustrated. The lower end of the shaft L carries a bevel-gear N, which in turn meshes with the gear P, carried by a crank-shaft Q, whereby the turning of the crank-shaft will revolve the vertical shaft L and through the medium of the gear described rotates the shaft F, and the shaft F in turn rotates the vertical shaft C, situated at the inner side of the standards B. The rotation of these shafts C will raise and lower the screw-threaded sockets E, as will be readily understood. These sockets E are provided with inwardly-extending arms *b*, to which are journaled the holders R. These holders have upper and lower arms *c c'*, for a purpose to be presently described. One of these holders R is provided with a gear *d*, by means of which it is rotated through the medium of a shaft *e*. (Clearly shown in Fig. 5.) This shaft *e* is journaled to one of the sockets E and at one side of the screw-threaded shafts C. Attached to the inner end of this

shaft *e* is a pinion *f*, meshing with the gear *d* of the holder R. The outer end of this shaft *e* is provided with a gear *g*, which meshes with a clutch *h*, the said clutch adapted to move vertically upon the shaft L.

In operation a sheet of canvas *i* is placed upon the mattress and over which the bedclothing is placed and upon which the invalid lies. When it is desired to change the bedclothing, the ends of the canvas sheet *i* are attached to the lower arms *c'* of the holders R, through the medium of buttons *s* or other fastening devices, and an additional canvas sheet *k* is placed over the invalid with its ends connected with the upper arms *c* of the holders R, and then the edges of the canvas are united through the medium of the rope or lacing *t*. The invalid is elevated then through the mechanism before described in the position shown in Fig. 2 and then rotated through the medium of the shaft *e*, as before described, into the position shown in Fig. 3. Then by the removal of the canvas *i*, which is now the upper canvas, the bedclothing may be removed and new clothing placed thereon, the invalid turned again to the position shown in Fig. 2 and lowered upon the bed, as will be readily understood.

The gear-wheel G, carried by the shaft F, is loose thereon and adapted to be locked to the shaft through the medium of a clutch *m*. When the clutch is in the position shown in Fig. 6, the wheel G is loose upon the shaft F, and the head of the invalid may be lifted or he may be raised to an inclined position, as may be desired.

From the above description it will be noted that we have constructed a mechanism which is simple and by means of which a single person with but little exertion is enabled to handle an invalid with perfect comfort to the latter, and to change the bedclothing as may be desired, or to raise the head of the invalid, or even to raise the invalid to an inclined position.

We do not limit ourselves to the specific arrangement here shown whereby the invalid is adapted to be raised and turned for the purpose described, for these may be varied, as will readily occur to skilled mechanics, without departing from the spirit and scope of our invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. An apparatus of the character described comprising standards, vertical screw-shafts at their inner sides, sockets adapted to be elevated by the shafts, rotating holders upon the sockets, and sheets connected to the holders whereby the sockets may be elevated and the invalid turned, substantially as described.

2. An apparatus of the character described comprising a supporting-frame, vertically-journaled screw-threaded shafts, a horizontal shaft, the vertical and horizontal shafts having intermeshing gears, internally-screw-threaded sockets engaging the screw-threaded shafts, the sockets carrying rotating holders, and invalid-supporting sheets adapted to be connected to the rotatable holders, substantially as described.

3. An apparatus of the character described comprising a supporting-frame, vertical elevating-shafts, a horizontal shaft, the vertical and horizontal shafts having intermeshing gears, vertically-movable sockets engaging the said vertical shafts and moved vertically by the rotation thereof, rotatable holders carried by the sockets, and means for rotating the holders, substantially as described.

4. An apparatus of the character described comprising a supporting-frame, vertically-arranged elevating-shafts a horizontal driving-shaft, intermeshing gears between the vertical and horizontal shafts, rotatable holders movable vertically for engagement with the vertically-arranged shafts, sheets secured to the upper and lower portions of the rotatable holders, uniting members for the edges of the sheets, and means for rotating the holders, substantially as described.

5. An apparatus of the character described comprising a supporting-framework, vertically-arranged elevating-shafts, vertically-movable members elevated by the shafts, rotatable holders supported by the elevating members, an invalid support or sheet having its ends connected to the holders, one of the holders having a gear, and a shaft carried by one of the elevating members provided with a pinion engaging the said gear of the holder, the parts adapted to operate as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

FRANK SPICER.
WILLIAM SNYDER.

Witnesses:
D. M. ROTHENBERGER,
J. L. LYTE.