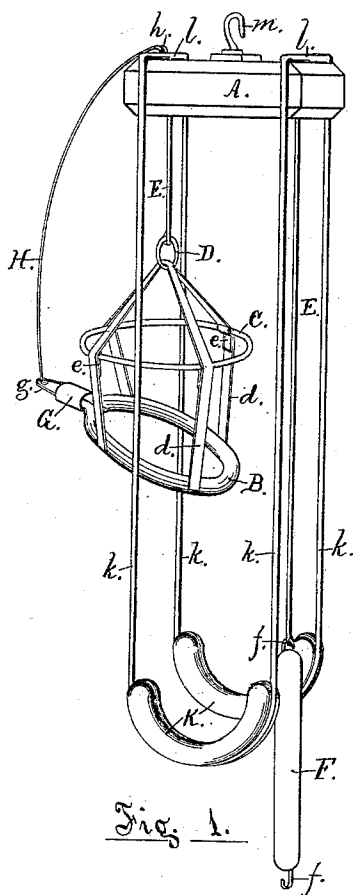
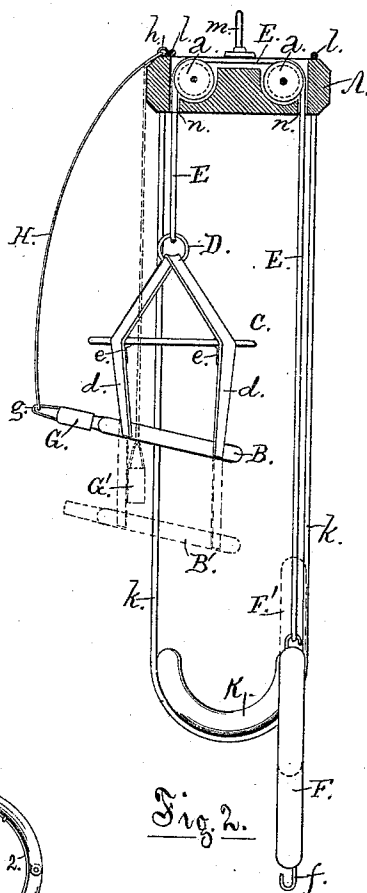
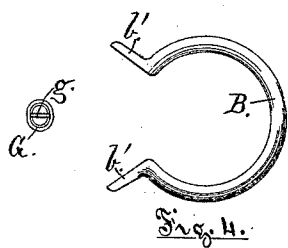
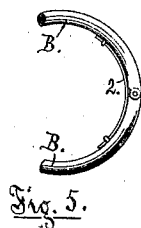
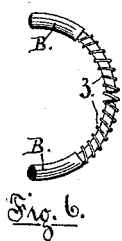
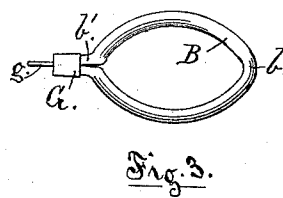


(No Model.)

I. BUSHONG.
SUSPENSION APPARATUS.

No. 445,658.

Patented Feb. 3, 1891.



Witnesses:
Danl. H. Herr.
Geo. A. Lane

Inventor
Lorael Bushong,
By Wm. R. Gerhart
Attorney

UNITED STATES PATENT OFFICE.

ISRAEL BUSHONG, OF NEW HOLLAND, PENNSYLVANIA.

SUSPENSION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 445,658, dated February 3, 1891.

Application filed October 31, 1889. Serial No. 328,813. (No model.)

To all whom it may concern:

Be it known that I, ISRAEL BUSHONG, a citizen of the United States, residing at New Holland, in the county of Lancaster and State of Pennsylvania, have invented certain Improvements in Suspension Apparatus, of which the following is a specification.

This invention relates to improvements in that class of suspension apparatus used for the treatment of ataxia and kindred affections, whereby the body is suspended with a support about the neck, so as to exert a certain amount of tension upon the spine; and the objects of my improvements are, first, to regulate the amount of tension to which the spine is subjected, and, second, to so construct the apparatus that upon the giving way of any of the other supports of the body, so as to throw an undue amount of strain upon the neck, the band upholding it will yield and the neck be released therefrom. I accomplish these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my suspension apparatus. Fig. 2 is a vertical longitudinal section through the head-block, showing a side view of the neckband, one of the arm-supports, and the weight. Fig. 3 is a top view of the neckband in the position occupied by it when embracing the neck of the patient, and Fig. 4 a similar view of the same with the retaining-collar removed and the jaws of the band open. Figs. 5 and 6 are views of the neckband with the padding removed, showing two forms of spring that may be used with the hinge.

Similar letters and figures indicate like parts throughout the several views.

Referring to the details of the drawings, A represents a head-block provided on the top with a centrally-located hook *m*, by which it is suspended by a rope or cord from some elevated support. A groove extends partially across the top of the head-block, in the bottom and near the ends of which there are formed recesses, in which are journaled two sheaves *a*. A cord E passes over the sheaves *a* and has its ends extending downward through orifices *n* in the bottom of the ends of the groove. From one end of the cord there is suspended a weight F, and to the

other is attached the device which supports the head. This device consists of an oval band B, which surrounds the neck of the patient and is supported by two straps *d*, each strap being connected with the band B at both ends at points located opposite each other in a line passing diagonally across the band, the loops so formed crossing each other in and being sustained by a ring D, secured to the end of the cord E. Between the neckband and ring D there is placed an expansion-ring C, around the outside of which the straps *d* pass, the straps being secured in position to the ring C by loops *e*, as shown in Figs. 1 and 2.

The neckband B is divided into two parts, hinged together at one end and provided with corresponding outwardly-projecting jaws *b'* at the other, which, when the band is engaged with the neck of the patient, are held together by a collar G, provided with a loop *g*, connected with the head-block A by a cord H. Connected with the hinged ends of the parts of the neckband there is a spring 2, as in Fig. 5, which laps the hinge and acts to force the sides of the band apart when the collar G is removed, thus insuring the disengagement of the band from the neck. Preferably I use a coiled spring 3, which encircles the ends of the parts of the neckband and serves as both hinge and spring, as shown in Fig. 6.

At both ends of the head-block a cord *k* passes transversely over it, the loops formed thereby supporting a rigid arm-piece K on each side of and below the head-block. These arm-pieces are formed of any suitable rigid material which will preserve its shape under the weight it has to carry, and they are shaped very much the same as the handle of a clutch, so as to fit comfortably under the arm without compressing the sides of the shoulder. In devices heretofore used for this purpose flexible bands were passed under the arms to sustain the body, and the effect was to stop or seriously retard circulation. To render them more comfortable, both the neckband and arm-supports are padded, as shown in the first four figures.

When a patient is under treatment the various parts of the apparatus occupy the positions shown in Figs. 1 and 2. In this position

the band B encircles the neck of the patient, the straps *d* being held away from the head by the expansion-ring C, the front and back of the band B being adjustable vertically with reference to each other by reason of the loose connection of the straps *d* with the ring D. The tension upon the spinal cord, which must be especially adapted to suit each case, is regulated by the weight F. This weight is provided with hooks *f* at both ends, by one of which it is suspended and to the other of which additional weights can be hung.

The patient in using this apparatus, when able, generally stands upon a box or stool, applies the auxiliary supports or arm-pieces, then places the head or neck gear in position and allows himself to be suspended by stepping off the stool; or he may stand upon the floor, and after the apparatus is adjusted may be raised with block and tackle attached to the wall or the top support of the upper part of the suspension apparatus. It will be seen that if either of the arm-pieces break or slip the neck will be saved by the yielding of the weight F, and that by the yielding of the weight and consequent lowering of the neck-band B the tension on the cord H detaches the collar G from the jaws *b'*, and the band is released from the neck by the spring attached to it. The construction herein described will avert any of the dangerous and sometimes fatal accidents to which persons using apparatus of this kind have heretofore been liable.

In the application of my device I do not confine myself to the precise construction herein described, as it is obvious that a number of changes may be made therein without departing from the spirit of my invention. The position of the sheaves may be changed on the head-block, or the head-block used for apparatus which it may be desirable to transport from place to place may be dispensed with altogether and the sheaves and other supports be attached directly to the ceiling of the room or a projecting beam.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a suspension apparatus, the combination of a support for the body, a neck-support, and a weight for upholding the neck-support, substantially as specified.

2. In a suspension apparatus, the combination of a support for the body, a yielding support for the neck, and means for automatically releasing the support from the neck upon the giving way of the body-support, substantially as specified.

3. In a suspension apparatus, the combination, with a support for the body, of a support for the neck, consisting of a band divided into sections, having a hinged connection at one end and separably connected at the other, and a spring for opening the sections about the hinge, substantially as specified.

4. In a suspension apparatus, the combination, with a support for the body, of a support for the neck, having jaws hinged at one end and separably connected together at the other, substantially as specified.

5. The combination, with a head-block, of a support for the body attached thereto, sheaves journaled to the head-block, a rope or cord passing over the sheaves, a neck-support attached to one end of the cord, and a weight secured to the other, substantially as specified.

6. The combination, with a head-block, of a support for the body, a yielding support for the neck, consisting of a band divided into sections having a hinged connection at one end and provided with jaws *b'* at the other, a collar G, adapted to take over the jaws, and a connection between the collar and the head-block, substantially as and for the purpose specified.

7. The combination, with a head-block having sheaves journaled thereto, of a cord passing over said sheaves, a neck-support attached to one end of the cord and a weight secured to the other, an arm-piece suspended from each side of the head-block, and a connection between the head-block and the neck-support, whereby the latter may be detached from the neck upon the giving way of the arm-pieces, substantially as specified.

8. The combination, with a head-block having sheaves journaled thereto, of a cord passing over said sheaves, a neckband attached to one end of the cord and consisting of sections having a hinged connection at one end and provided with jaws *b'* at the other, a weight secured to the other end of the cord, a collar G, adapted to take over the jaws of the neckband, a connection between the collar G and the head-block, and an arm-piece suspended from each side of the head-block, substantially as and for the purpose specified.

9. The combination, with a head-block provided with sheaves, of a cord passing over said sheaves, a weight secured to one end of said cord, and a ring D connected with the other, a neckband, and straps *d*, passing loosely through the ring D and having their ends fastened to the said neckband, substantially as specified.

10. The combination, with a head-block provided with sheaves, of a cord passing over said sheaves, a weight secured to one end of said cord, and a ring D connected with the other, a neckband, straps *d* passing loosely through the ring D and having their ends fastened to the said neckband, and an expansion-ring C, interposed between the neckband and the ring D, substantially as specified.

ISRAEL BUSHONG.

Witnesses:

WM. S. ROLAND,
DANIEL H. GRUBE.