(No Model.)

A. H. MERRILL.

FOLDING BED.

No. 403,851. Patented May 21, 1889.

Fig. 1

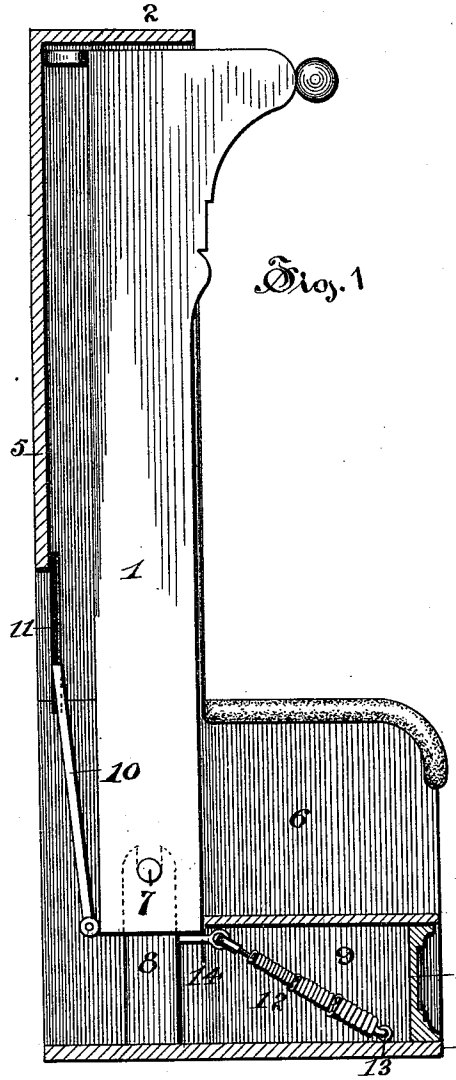


Fig. 2

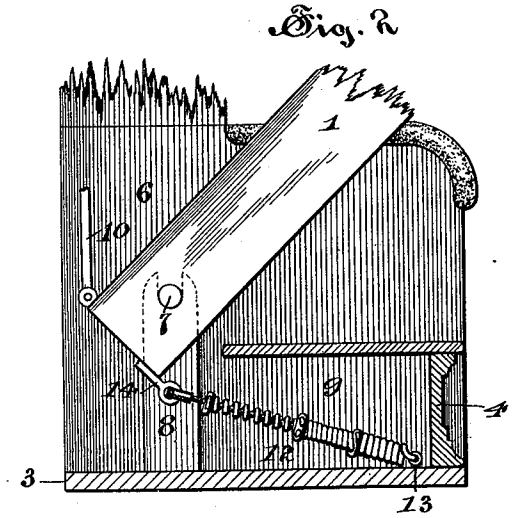


Fig. 3

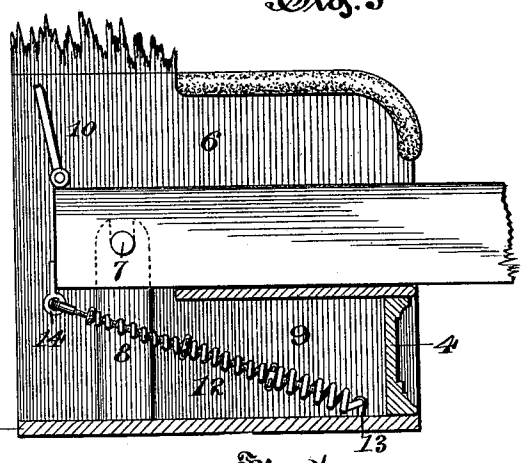


Fig. 4

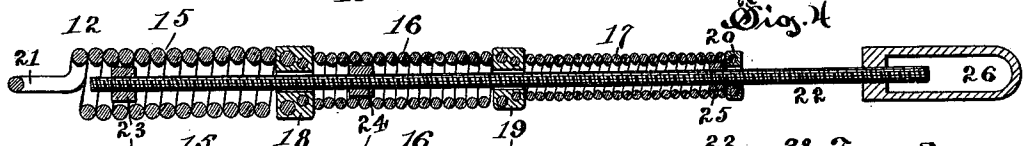
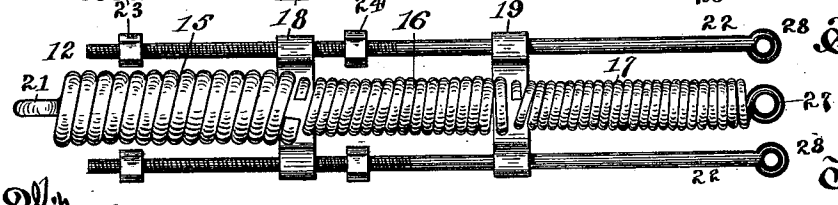


Fig. 5



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UNITED STATES PATENT OFFICE.

ARTHUR H. MERRILL, OF HARTFORD, CONNECTICUT.

FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 403,851, dated May 21, 1889.

Application filed February 14, 1889. Serial No. 299,840. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. MERRILL, of the city and county of Hartford, Connecticut, have invented certain new and useful Improvements in Folding Beds, which improvements are described in the following specification and are illustrated by the accompanying drawings.

The present invention consists of a compound coiled spring which is constructed in a peculiar manner, and is attached to the case and mattress-frame of a folding bed, for the purpose of facilitating the usual operations of raising and lowering the mattress-frame.

The object of the invention is to oppose to the force of gravity which affects the mattress-frame variably in its changing positions the elasticity of a compound coiled spring, which is arranged to operate in a similarly-variable manner, according to the position of the mattress-frame.

The best manner in which I have contemplated applying the principle of my invention is illustrated in said drawings, in which—

Figure 1 is a side view of my improved folding bed, the mattress-frame being in an upright position and the near side of the bed-case being removed. Fig. 2 is a like view of the same, the mattress-frame being in an inclined position and portions of both bed-case and mattress-frame being removed. Fig. 3 is a similar side view showing the mattress-frame in a horizontal position. Fig. 4 is a detail showing in longitudinal section the above-mentioned compound coiled spring, which is a part of my invention. Fig. 5 is a detail plan view of said spring in a modified form.

In the views the numeral 1 denotes a mattress-frame. This frame, which may be constructed in any ordinary or convenient manner, is preferably of the general form of a shallow rectangular box open on that side which is upward in Figs. 2 and 3. Within this frame a spring fabric (not shown in the drawings) may be extended for the support of a mattress and other bedding within said frame, in the usual manner.

The numerals 2, 3, 4, 5, and 6 denote, respectively, the top, bottom, front, back, and side of the cabinet or bed-case, in which the mattress-frame is hinged or pivoted by means of a straight bar or rod, 7. This rod passes through mattress-frame 1 transversely, protrudes through both sides or side rails of the same, and is supported in a horizontal position by two slotted cleats, 8, which are placed within the bed-case and are fastened by screws to the opposite sides of the same, respectively. The lower part of the bed-case is made deeper from front to back than the upper part of the same, for the purpose of enlarging the base of support of the entire structure, and also for the purpose of forming an anterior chamber, 9, within said bed-case for the accommodation of the compound coiled springs, which will be hereinafter described.

The head of frame 1 is provided in the usual manner with a hinged head-board, 10, capable of sliding up and down in the back part of the bed-case. Head-board 10 is confined by means of an inside groove, 11, which is formed in each side piece of the bed-case. In chamber 9 are two springs, 12, which are attached to the bottom of the bed-case in the anterior portion of chamber 9 by hooks or screw-eyes 13 and to the end of frame 1 by brackets 14. One of said springs 12 may be seen in each of the Figs. 1, 2, and 3. Said two springs, with their described attachments, are duplicates of each other and are located near the opposite sides of the bed-case, respectively.

The compound spring 12 (seen in Fig. 4) is composed of three simple coiled springs, 15, 16, and 17, which are of unequal and successively diminishing strength or elasticity, in the order named, as indicated by the apparent size of the respective wires of which they are composed. Springs 15 and 16 are fastened together end to end by means of a head, 18, having holes, into which a terminal portion of each of said springs 15 and 16 is inserted. This head has a central perforation in line with the longitudinal axis of said springs. In like manner springs 16 and 17 are united by means of a similar head, 19. The free end of spring 17 is provided with a perforated head, 20, and the free end of spring 16 is provided with a terminal hook or eye, 21, for engagement with screw-eye 13. Lengthwise through said

springs and heads, and loosely movable endwise therein, extends a straight screw-threaded traction-rod, 22, which is provided with nuts 23, 24, and 25, located, respectively, within springs 15, 16, and 17 and movable therein, but larger than the described perforations in heads 18, 19, and 20. That end of rod 22 which is remote from hook 21 is provided with a yoke or stirrup, 26, having a female screw-thread which engages said rod. This stirrup is designed to engage bracket 14.

The compound spring 12, which is above described as having three component springs, 15, 16, and 17, may, by obvious omissions, be made to have two component springs only. The resulting construction is sufficiently illustrated in Fig. 4 by disregarding one of said component springs 15, 16, and 17 and its contents. On the other hand, the number of said component springs may, by obvious additions, be extended at pleasure without departing from the principle of the invention.

The remaining features of construction of this bed will be readily understood from the drawings and from the mode of operation, which is now to be explained.

When the mattress-frame stands upright in the bed-case, as in Fig. 1, spring 12, being, by previous adjustment, either at a slight tension or at no tension at all, as in Figs. 1 and 4, serves to hold the mattress-frame in that position. That part of spring 12 which consists of springs 15 and 16 is then at no tension. When the mattress-frame is turned downward in the operation of lowering the same by hand, spring 17 is gradually extended by the pull of nut 25 against head 20 until nut 24 encounters head 19. Spring 17 is then relieved and can be extended no farther. As the downward motion of the mattress-frame continues, spring 16 is in turn extended by the pull of nut 24 against head 19 until relieved by the striking of nut 23 against head 18. Then, as the downward motion of frame 1 continues, spring 15 in turn is brought to tension finally. In this manner the several component springs 17, 16, and 15 are successively brought to a predetermined degree of tension, and no more. In raising the mattress-frame from its horizontal position they are successively relieved of their extension in inverse order. Figs. 1 and 3 show the positions of said springs corresponding to the perpendicular and horizontal positions of the mattress-frame, respectively; and Fig. 2 exhibits the position of said springs when the mattress-frame occupies an intermediate position either in rising or falling. The result of this mode of operation is an approximately uniform tendency of the mattress-frame toward uprightness in all positions of deflection therefrom; also, the pull of said springs is in such a direction as to create but little tendency in the bed-case to follow the downward motion of the mattress-frame during the operation of lowering the latter for use. That previous adjustment of spring 12 which results in the described mode of operation is effected, while that spring is free from its described attachments 13 and 14, by turning nuts 23, 24, and 25 and stirrup 26 to the necessary positions upon rod 22. The best results are obtained when the described duplicate springs 12 are not adjusted so as to act strictly in unison.

That modification of my invention which is illustrated in Fig. 5 needs little separate explanation. The difference in construction is obvious. Instead of one screw-rod, 22, within spring 12, this modification presents two such rods upon opposite sides of that spring. Spring 17, instead of a terminal head, 20, is provided with a terminal ring, 27, for direct attachment to bracket 14, and rods 22 are provided with terminal rings 28 for the same purpose, in lieu of stirrup 26. The general mode of operation is the same as that which is above described.

Such being the construction and mode of operation of my improved folding bed in its primary and its modified form, I claim as my invention—

1. In a folding bed, a bed-case and a mattress-frame which is pivoted in said case, in combination with a compound coiled spring attached to said case and to said frame, and consisting of a series of two or more coiled springs of unequal strength or elasticity, which are fastened end to end, and are provided with a corresponding number of terminal perforated heads, and an axial rod carrying an equal number of nuts adjustable thereon which are adapted to engage said heads, respectively, substantially as and for the purpose specified.

2. In a folding bed, a bed-case, a mattress-frame which is pivoted in said case, and a series of coiled springs of unequal strength or elasticity which are provided with terminal heads, in combination with an axial screw-threaded rod carrying nuts adjustable thereon which are adapted to engage said heads within said spring, substantially as and for the purpose specified.

3. In a folding bed, a bed-case, a mattress-frame which is pivoted in said case, and a series of two or more coiled springs of unequal strength or elasticity arranged in line, provided with heads fastened together and attached to said bed-case, in combination with a screw-threaded traction-rod which is provided with nuts for engagement with said heads and is attached to said mattress-frame, substantially as and for the purpose specified.

4. In a folding bed, a bed-case, a mattress-frame which is pivoted in said case, and a number of unequal-coiled springs, joined in one, provided with heads and attached to said bed-case, in combination with a screw-threaded traction-rod which is provided with nuts adjustable thereon for engagement with said heads and is attached to said mattress-frame, substantially as and for the purpose specified.

5. In a folding bed, a bed-case and a mattress-frame which is pivoted in said bed-case, in combination with a number of coiled springs of unequal elasticity having a fixed attachment to each other and to said bed-case, and provided with a traction-rod which has a fixed attachment to said mattress-frame and a sliding attachment to said springs, substantially as and for the purpose specified.

In testimony whereof I hereunto set my name in the presence of two witnesses.

ARTHUR H. MERRILL.

Witnesses:
WILLARD EDDY,
RICHARD H. MATHER.