

(No Model.)

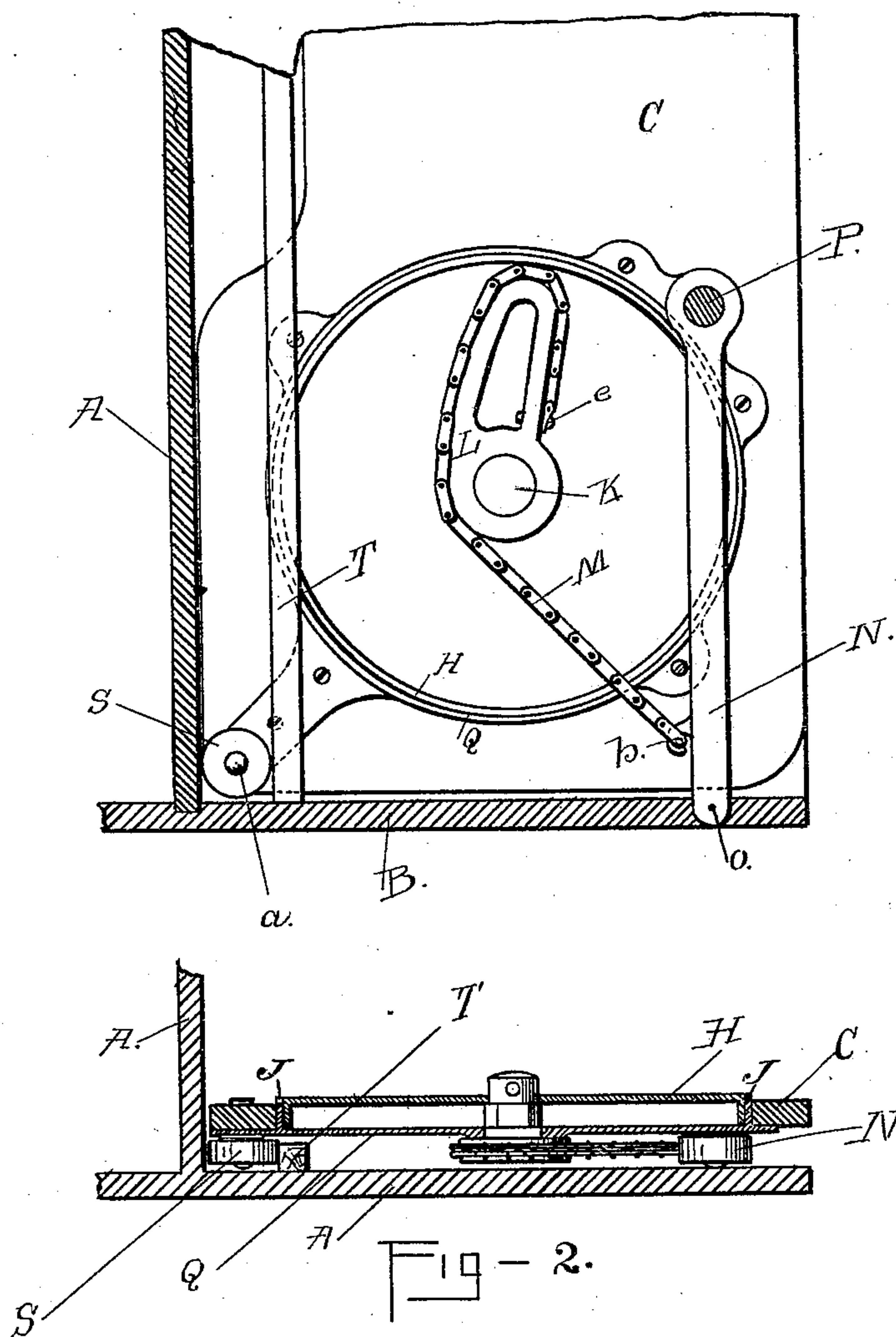
3 Sheets—Sheet 1.

D. H. BRENNER.
FOLDING BED.

No. 492,706.

Patented Feb. 28, 1893.

FIG-1



WITNESSES:
Harry P. Van Wagner.
A. L. Champelin

INVENTOR
David H. Brenner
BY Edward Taggart
His ATTORNEY

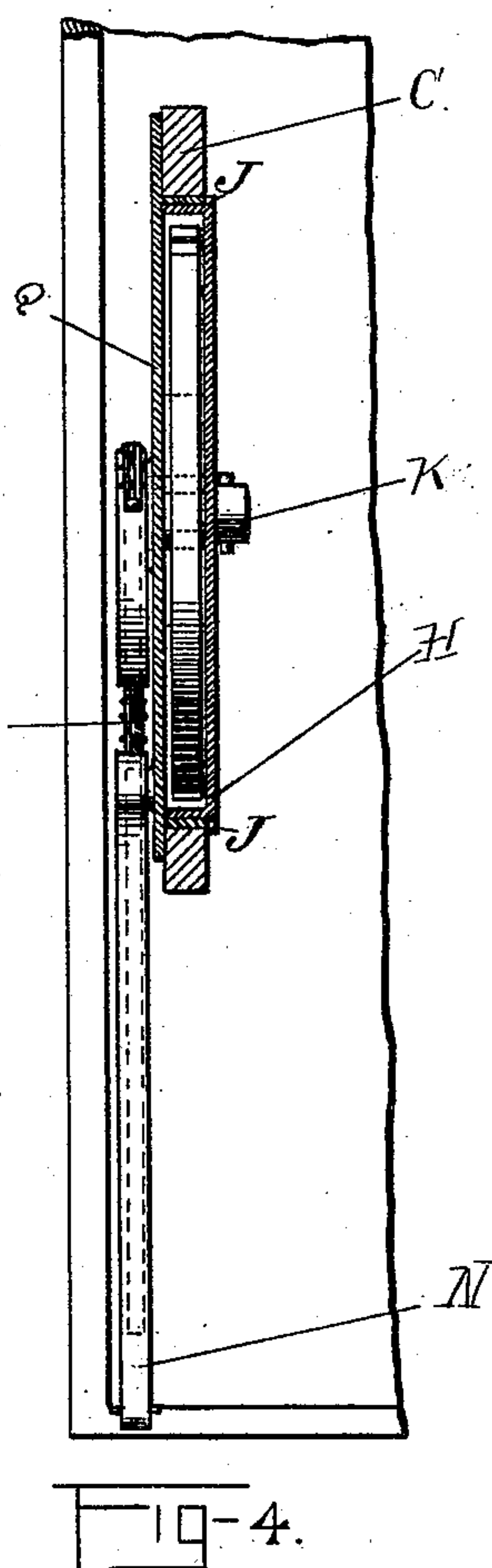
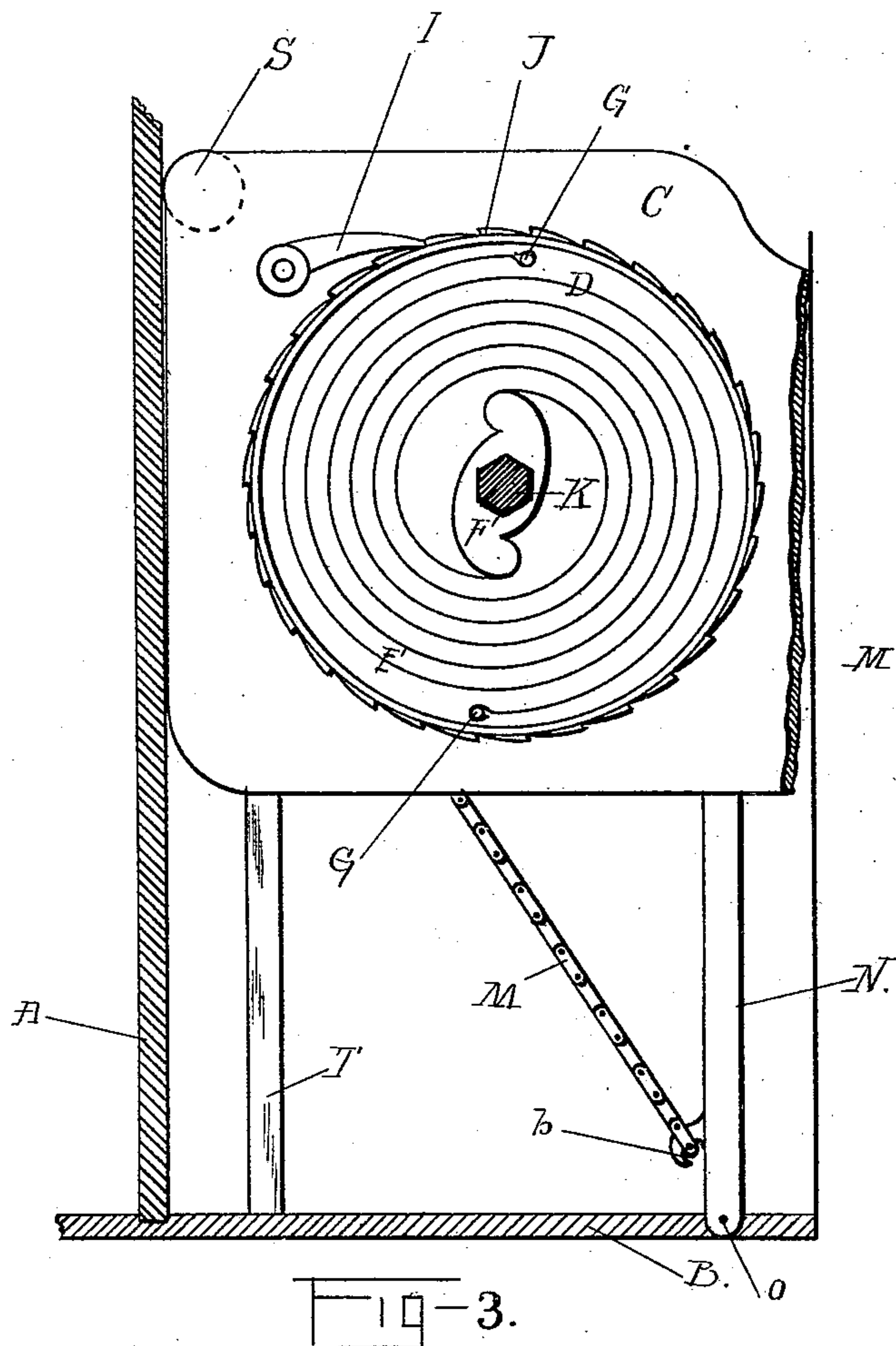
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WITNESSES:
Harry P. Van Wagner.
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INVENTOR
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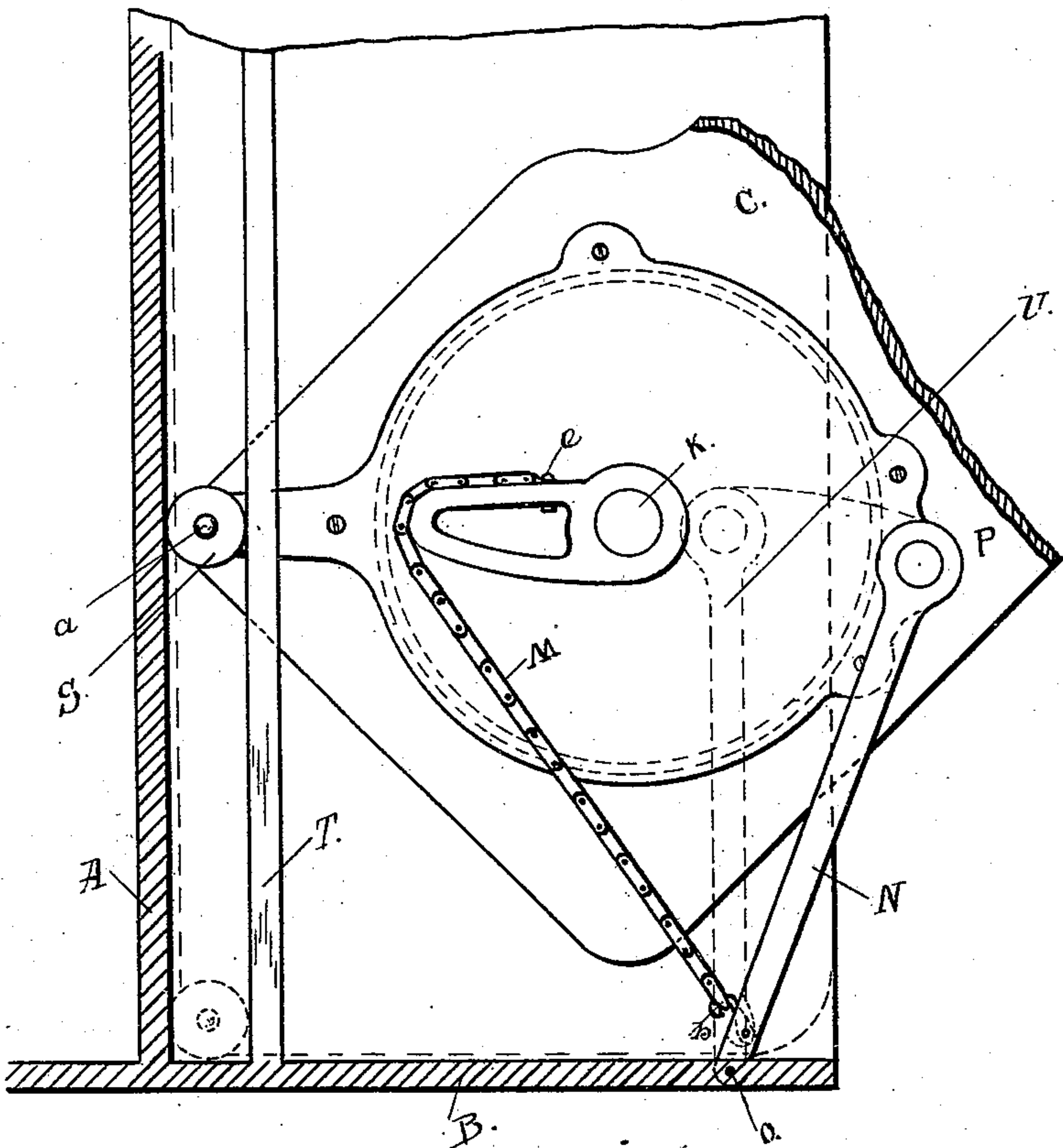
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Fig— 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

DAVID H. BRENNER, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO DAVID W. KENDALL, OF SAME PLACE.

FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 492,706, dated February 28, 1893.

Application filed December 9, 1891. Serial No. 414,533. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. BRENNER, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Folding Beds, of which the following is a specification.

This invention relates to a folding bed in which the bed body is counterbalanced by means of a spring attached to the bed body or side rails thereof.

The objects of the invention are, first, to attach a spring to a side rail so that it may as nearly as possible counterbalance the weight of the bed body in whatever position it may be turned. Second, to arrange in connection with said spring, bed body, and bed frame a supporting lever or arm, whereby the bed body may be folded into as small a space as possible. Third, in the other elements of construction hereinafter more particularly pointed out and described. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure (1) shows an outside view of the lower end of a side rail, or the end of a side rail next to the upright case, showing the position of the supporting lever, the spring, the eccentric or compensating lever, and the other parts connected therewith, when the bed body is folded within the case. Fig. (2) is a plan view of the spring and connecting parts with a part of the case in section. Fig. (3) is an inside view of a side rail when lowered or unfolded, together with a side view of the spring and its attachments. Fig. (4) is an end view of the spring, with a portion of the covering or case removed, also an elevation of the lever, showing in dotted lines the flexible connection between the spring or strip to which the spring is attached, and the supporting lever; and Fig. (5) shows a side view of the case covering the spring, portions of the side rail when turned at an angle of forty-five degrees for the purpose of showing the position of the spring and its attachments and the guides.

Similar letters refer to similar parts throughout the several views.

A. represents the upright case, into which the bed body is folded. This case may be con-

structed in any suitable form and of sufficient size to receive the bed body within it.

B. represents the base of the frame.

C. represents a portion of the side rail.

D. represents a spring securely attached to the side rail and in the example of my invention shown in the drawings covered by a receptacle having a cap H. In the example of my invention shown I have provided also another spring E.

F. is a yoke or block attached to the shaft K. rigidly for convenience in attaching the spring to the shaft. Each spring is coiled in the form shown, and the outer end of the spring is suitably attached to one of the pins G., which pins G. are rigid with the cover or cap H, and each yoke or block F. is revolved or oscillated with the shaft K. In case the weight of the bed body is not too great, one of the springs may be dispensed with, or a strong spring may be used in place of the two springs, although I prefer to use the springs arranged as described.

The yoke F. may be constructed in any form, its only object being to attach the springs to the shaft K, and it may be dispensed with and the spring attached directly to the shaft.

H. is a cap which covers the receptacle for the springs, for the purpose of inclosing the springs from sight and preventing injury thereto. A dog I. engages with the notches J on a projecting portion of the periphery of the cap for holding the spring under tension, while permitting the cap to be turned by means of a suitable implement to increase the tension of the spring. An eccentric or lever L. is used, which moves with the shaft K. The part L. may be made in any suitable form, the object being to carry the end of the flexible connection away from the spring shaft in order to increase the leverage upon the spring to compensate the increased tension of the spring.

M. is a flexible connection composed of a chain or cord connected at one end with the shaft K through the medium of the lever or eccentric L and at the opposite end with the supporting case through the medium of a supporting lever hereinafter referred to.

In some forms of my invention the point of

attachment of the flexible connection may be varied and it may be attached directly to the lower end of the case. This would be so in case the side rail were pivoted to the case instead of to the upper end of the lever N., although I prefer the connection shown in the drawings.

N. is a supporting lever or arm pivoted or otherwise supported at its lower end so as to have a vibratory motion. It is also pivoted to the side rail at its upper end at the point P., the lower end being shown by the pivot O. The supporting lever N. is used where it is desirable to have the bed body fold into a shallow case or upright frame. The shell enclosing the spring is shown by Q. When the arm N. is used I use a pulley S. which moves along the track or way T.

In Fig. (5) the dotted lines show the position of the pulley and the lever N. when the body is folded within the case.

The pulley S. turns upon the pivot or pin a.

The operation of my invention is substantially as follows: As the bed body is lowered or turned down the upper end of the supporting lever N. moves outwardly from the case until the body is approximately one-third or one-half way down. Then it moves backward toward the upright case into the position shown in Fig. (1). The guide pulley S. moves up the way T. until it reaches its upper position shown in Fig. (3). The springs are so arranged as to counterbalance as nearly as possible the weight of the bed body, and they may be so set as to make the counterbalance almost perfect. When the bed body is folded into the position shown in Fig. (1) the spring has the least tension, and the flexible connection M. is the nearest to the center of the shaft K. giving the spring its greatest leverage. As the bed body is turned downward the tension of the spring is increased, but as the lever or eccentric L. turns outwardly, so that the flexible connection draws farther and farther from the center of the shaft K., the leverage is increased, thereby compensating for the increased tension on the spring by the decreased leverage on the eccentric or lever L. By the use of the dog I. and the ratchet teeth J. the tension of the spring may be set at any required point. It will be observed that as the bed body is turned in one direction the tension produced by the flexible connection turns the eccentric L. in the other direction. The pivotal point of the side rail being at P. as the upper end of the bed rises, the lower end is raised, thereby lengthening the distance between the point of connection b. and c. of the flexible connection M. This has the effect to revolve the eccentric or lever L. and the shaft K. in a direction opposite to the movement of the bed raised upon its pivot as above described.

In the drawings I have shown one set of counterbalancing works. It will be understood, however, that this is duplicated, the same being applied on each side of the bed

body. In cases where the pivot P. is attached directly to the frame instead of being supported in the lever arm N., the upright case would necessarily have greater depth in order to allow for the free movement of the head end of the bed body.

I have described what I believe to be the best form of construction, but it is evident that variations may be made in the form of construction without departing from the spirit of my invention.

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

1. The combination with an upright case, and the pivoted side rail of a folding bed, of a shaft K having a lever or eccentric L, a coiled spring connected with the side rail and with the shaft, and placed under increased tension as the side rail is lowered and a chain or cord M attached to the lever or eccentric and connected with the case, substantially as described.

2. The combination with an upright case, and the pivoted side rail of a folding bed, of a shaft K, a coiled spring connected with the side rail and the shaft, and placed under increased tension as the side rail is lowered, and a cord or chain connected at one end with the shaft and at the opposite end with the upright case, substantially as described.

3. The combination with an upright case, and the pivoted side rail of a folding bed, of a cap H having teeth J at its periphery, a dog I carried by the side rail and engaging the teeth of the cap, a shaft K, a coiled spring connected with the shaft and the cap, and a chain or cord M connected at one end with the shaft and at the opposite end with the upright case, substantially as described.

4. The combination with an upright case, and the side rail of a folding bed, of a shaft K having a lever or eccentric L, a cap H having peripheral teeth J, a dog I carried by the side rail and engaging the teeth of the cap, a coiled spring connected with the cap and the shaft, and a chain or cord M attached at one end to the lever or eccentric and connected at its opposite end with the upright case, substantially as described.

5. The combination with an upright case, and the side rail of a folding bed, of a shaft K having a lever or eccentric L, a coiled spring connected with the shaft and with the side rail, a supporting lever or arm N pivotally connected at its upper end with the side rail and at its lower end to the base of the upright case, and a flexible connection M between the said supporting lever or arm and the lever or eccentric, substantially as described.

6. The combination with an upright case having a track or way T, and the side rail C having a guide pulley S movable in the track or way, of a shaft K having a lever or eccentric L, a coiled spring connected with the side rail and with the shaft, a supporting lever or arm N pivotally connected at its upper end

with the side rail and at its lower end to the base of the upright case, and a flexible connection M between the said supporting lever or arm and the lever or eccentric, substantially as described.

7. In a folding bed, the combination of a coiled spring, a side rail to which said spring is attached, a shaft, a lever or eccentric rigidly attached to said shaft, a supporting lever pivoted at its lower end to the case and at its upper end to the side rail, a flexible connection between said eccentric or lever and the lower part of the supporting lever or arm, substantially as described.

8. The combination of an upright case A, a side rail C, a shaft K having a lever or eccen-

tric L and a yoke or block F, a cap H having a pin G, a coiled spring connected with the yoke or block and with the pin, a supporting lever or arm N pivotally connected at its upper end with the side rail and at its lower end to the base of the upright case, and a flexible connection M attached at one end to the lever or eccentric and at its opposite end to the said supporting lever or arm, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

DAVID H. BRENNER. [L. S.]

Witnesses:

D. W. KENDALL,

EDWARD TAGGART.