

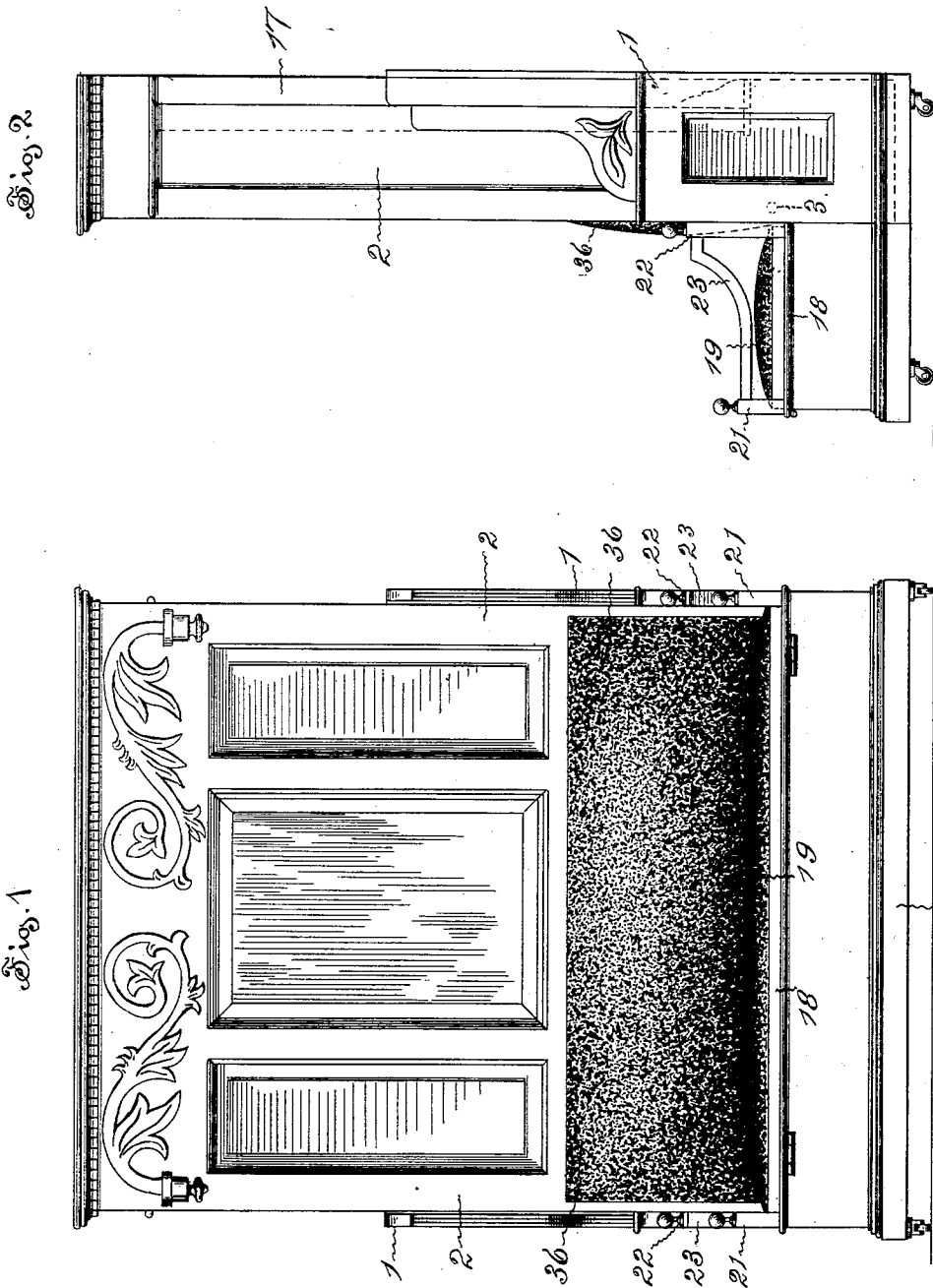
(No Model.)

3 Sheets—Sheet 1.

E. A. OHLIGER.
FOLDING BED.

No. 587,853.

Patented Aug. 10, 1897.



Witnesses:
W. H. Williams
E. J. Hyde.

Inventor,
Ernest A. Ohliger, by
Harry P. Williams
att

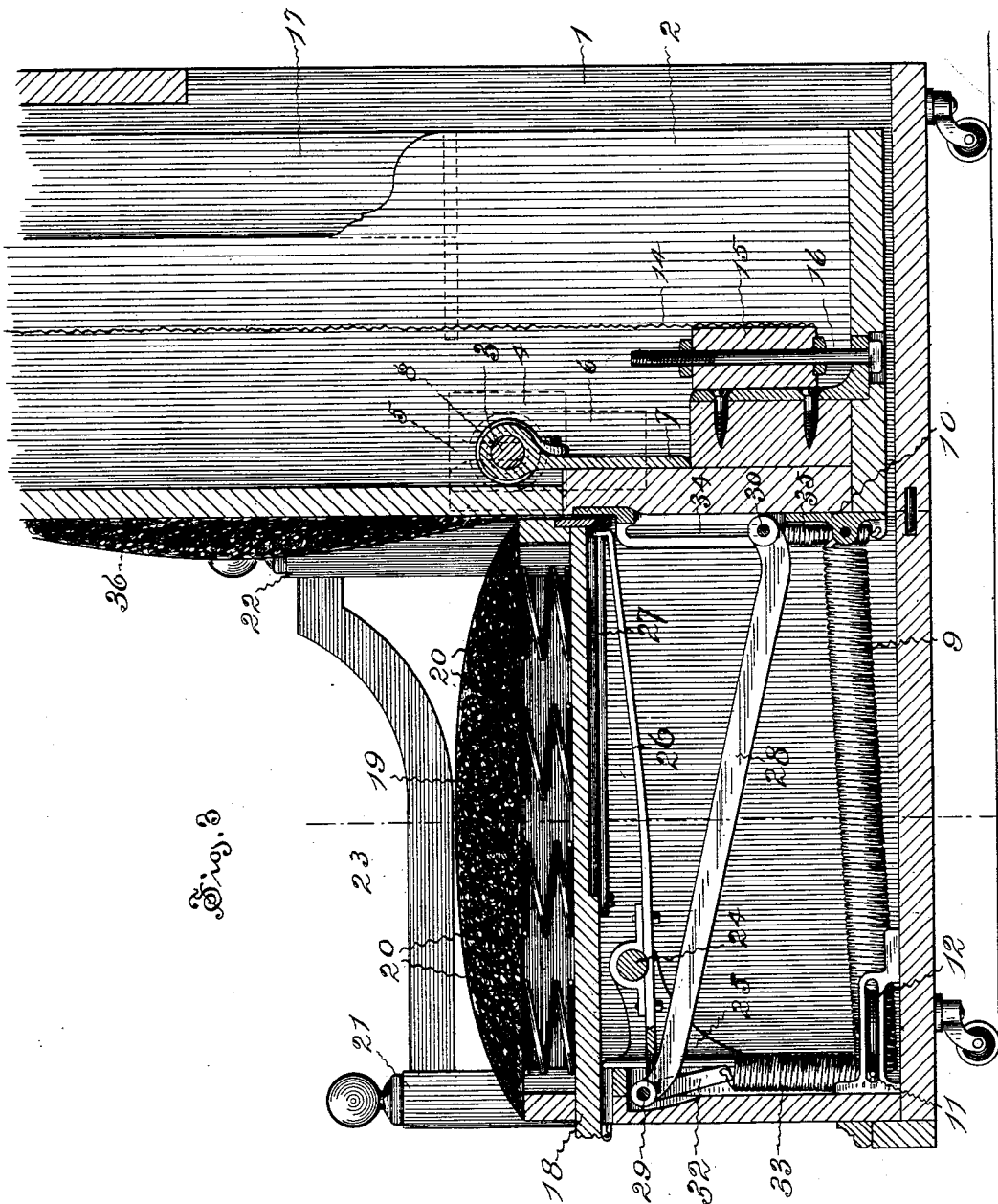
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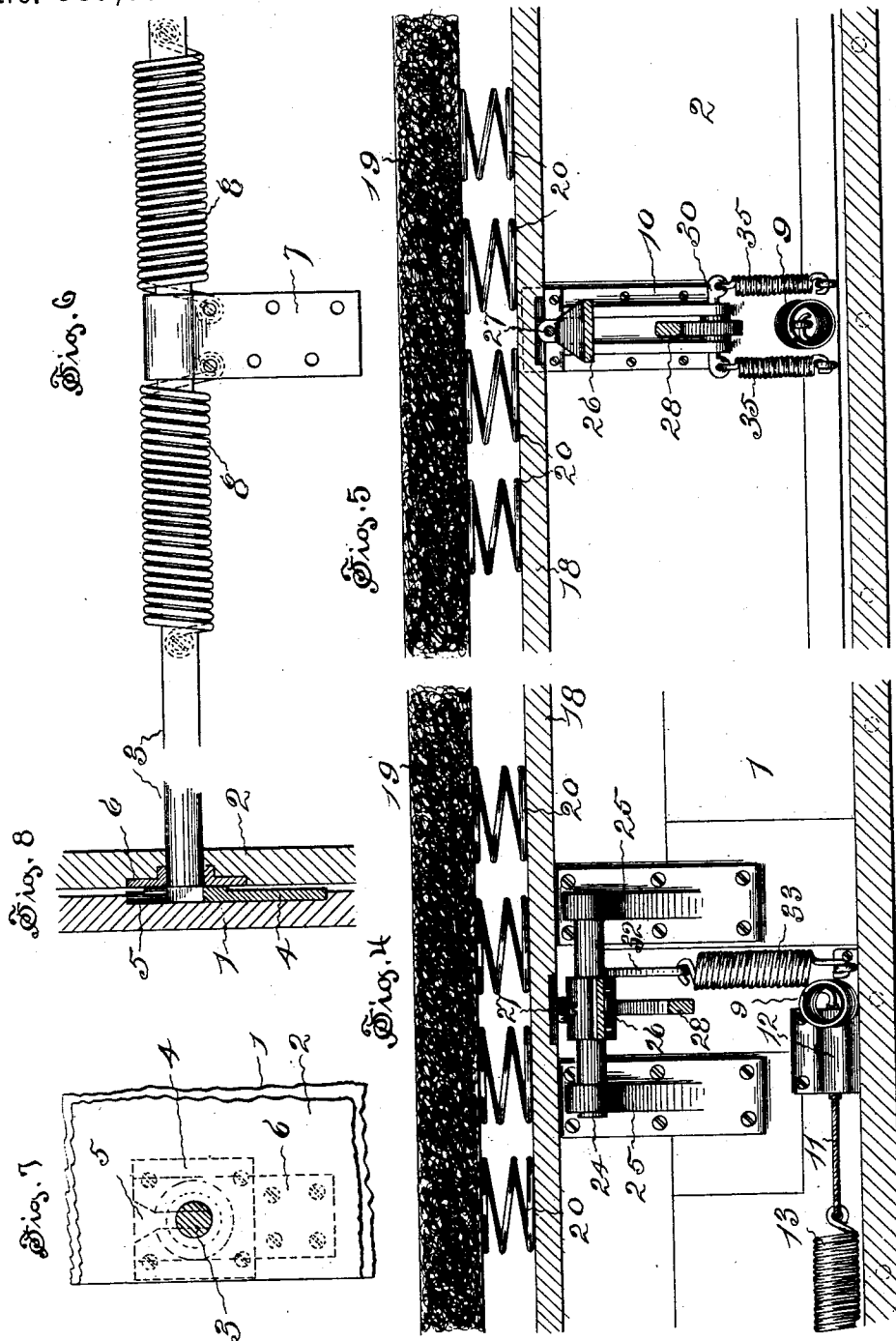
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UNITED STATES PATENT OFFICE.

ERNEST A. OHLIGER, OF HARTFORD, CONNECTICUT, ASSIGNOR OF THREE-
FOURTHS TO SAMUEL J. HUSSEY AND FRANK H. WHIPPLE, OF SAME
PLACE, AND THOMAS M. SMITH, OF WEST HARTFORD, CONNECTICUT.

FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 587,853, dated August 10, 1897.

Application filed February 11, 1897. Serial No. 622,946. (No model.)

To all whom it may concern:

Be it known that I, ERNEST A. OHLIGER, a
subject of the Emperor of Germany, residing
at Hartford, in the county of Hartford and
State of Connecticut, have invented certain
new and useful Improvements in Folding
Beds, of which the following is a specification.

The invention relates to a piece of furni-
ture which has a bed hinged upon a pivot, so
that it can be turned up out of the way when
not desired for use, and which has a part that
forms a support for the bed when down and
affords a sofa, lounge, or settee for use when
the bed is up.

The object of the invention is to provide a
simple, inexpensive, and light-weight balanc-
ing mechanism which is so arranged as to
permit the bed to be folded or unfolded with
but little effort and yet prevent the bed from
moving from either position accidentally,
the mechanism being so connected with the
parts that the seat will be unfolded by the
turning down of the bed and form a support
for the bed and will be folded up by the turn-
ing up of the bed and arranged for use.

The embodiment of the invention which is
shown has a case, a bed hinged upon a pivot
supported by the case, springs connecting
the case and the bed and brought into tension
by the movement of the bed for balancing its
weight, a seat hinged to the case, and mech-
anisms connecting the bed with the seat in
such manner that the oscillation of the bed
swings the seat on its hinge, as more particu-
larly hereinafter described, and pointed out
in the claims.

Referring to the accompanying drawings,
Figure 1 shows a front elevation of an em-
bodiment of the invention with the bed folded
out of the way and the seat arranged for use.
Fig. 2 is a side elevation of the same. Fig.
3 is a section on larger scale, taken through
the lower portion, showing the mechanisms
in the positions occupied when the bed is
raised and the seat is in position for use.
Fig. 4 is a transverse section taken on the
plane indicated by the broken line of Fig. 3,
looking toward a small portion of the front.
Fig. 5 is a similar sectional view on the same
plane, looking toward the back. Fig. 6 is a

detail view showing the pivot-shaft and the
balancing-springs which it supports. Fig. 7
is a section of the pivot-shaft, looking toward
the bearings on one side. Fig. 8 is a sec-
tional view at one end of the pivot-shaft,
showing the arrangement of its bearings.

In the views, 1 indicates the case. This
case may be built of any suitable material
in any approved design, but it is preferably
put together in such manner that it can be
readily taken apart for convenience in trans-
porting. Mounted within the case is a bed 2.
The frame of the bed may be of ordinary
shape, and its bottom is usually finished with
panels of wood or glass and otherwise orna-
mented, so as to present a pleasing appear-
ance when the bed is folded up. The bed is
supported by a pivot-shaft 3, that extends
from side to side and is held at its ends by
plates 4, secured to the side walls of the case.
The supporting-plates 4 preferably have slots
5, and the ends of the pivot-shaft are flattened
and fitted into the slots in the plates, so that
the pivot-shaft is held against rotation. Sec-
ured to the sides of the bed are perforated
plates 6, and the pivot-shaft passes through
these plates, so that when the bed is oscil-
lated the weight is borne by these bearing-
plates.

Attached to the wall of the bed-frame near
the head adjacent to the pivot is a plate 7,
with a perforation through which the pivot
passes, and mounted upon the pivot adjacent
to this plate are a pair of springs 8. These
springs have their outer ends connected with
the shaft and their inner ends secured to the
plate, and when the plate and the bed to
which it is attached are rotated, as in unfold-
ing the bed, the springs are coiled up in such
manner as to offer resistance to this move-
ment, and this resistance of course prevents
the too rapid movement of the bed in unfold-
ing and also aids in moving the bed when it
is being folded up. To further aid in balanc-
ing the weight of the bed, a spiral spring 9 has
one end connected with a plate 10, secured to
the bed, and has its other end attached to a
cord 11, that passes around a pulley 12 and
is attached to one end of another spiral spring
13, that has its other end secured to the case

by any suitable means at any convenient locality.

The bed may be provided with any suitable form of mattress-frame and mattress. The wire mattress 14 shown is connected across one end with a bar 15, which bar is held in place by bolts 16, that pass through the bar and through the end wall of the bed-frame or a bracket attached thereto, as shown in Fig. 3, in such manner that by the rotation of the bolts the bar may be moved and the mattress tightened or loosened as necessary.

The case preferably does not extend to the outer end of the bed, and to give the sides of the bed-frame a paneled appearance and to conceal the bedding along the low sides when the bed is raised false edge boards 17 are provided. These boards are loosely held at their ends by cleats or moldings, so that they can be slid toward the edges of the bed-frame to the position shown in Fig. 2 when the bed is not in use and is standing raised and so they can be slid in from the edges to the position illustrated in dotted lines in Fig. 2, thus lowering the sides of the bed when it is to be used, the real sides of the bed-frame being of the customary shape of such parts—that is, being lower along the middle of their length than at their ends.

The bottom 18 of the seat-frame is hinged at its front edge to the top of the front wall of the case. This seat-frame is usually provided with a suitably-upholstered cushion 19, supported upon seat-springs 20, and has posts 21 and 22, connected by bars 23, these latter parts forming the side arms of the seat when the bed is folded up, as shown in the views.

A shaft 24 is held in bearings formed in brackets 25, secured to the front wall of the case, and mounted upon this shaft is a lever 26. This lever is preferably formed of a flat bar of steel having some resiliency, and one of its ends is movably connected with a rod 27, secured to the bottom of the seat-frame, while the other end of the lever is loosely connected with the end of a bar 28. The rod 27 is preferably round, and the end of the lever 26 is bent and provided with a central perforation which fits the rod. A small pivot or hinge-pin 29 connects one end of the bar 28 with the forked end of the lever 26, and the other end of this bar is by a pin 30 connected with the plate 10, attached to the bottom of the bed-frame. Secured to the hinge-pin 29 is an arm 32, and to this arm is attached one end of a spring 33, the other end of which is secured to the case or a part attached to the case. The pin 30 passes through slots 34, formed in parts of the plate 10, and to the ends of this pin are connected the ends of springs 35, that are connected with parts of the plate 10. This arrangement forms an elastic or yielding connection between the end of the bar 28 and the end of the bed-frame.

When the bed is turned from its upright position and oscillates on the pivot-shaft, the

movement of the end below the pivot causes the bar 28 to draw the outer end of the lever 26, and the movement of this lever under the pull on the short end is such that the long end of the lever lifts the free edge of the seat from the case and causes it to turn on its hinge until the ends of the posts 22 move over sufficiently to rest upon the floor and form the front legs of the structure that supports the bed when down. When the parts reach this position, the top edge of the front portion of the case and the bottom edge of the seat-frame, which is now uppermost, form practically a plane surface upon which the turned-down bed rests. When the bed is turned up from a horizontal position, the end of the bed-frame pushes the bar 28 in such manner that it oscillates the lever 26 on its fulcrum, so that the long arm pulls the free end of the seat-frame over and causes it to close up. The end of the bar moves along the slots 34 in the plate 10, and the end of the long arm of the lever 26 moves freely along the rod 27 when the lever is turning the seat on its hinges. The bar 28 is connected with the bed at such a distance from the pivot and is connected with the short arm of the lever 26 so near its fulcrum, and the long arm of the lever is connected with the seat-frame at such a distance from its fulcrum, that the seat moves faster in opening than the bed in turning down, and this causes the seat to move out of the way of the bed when being opened. As the lever 26 is somewhat flexible, the movement of the seat is easy and all slight irregularities of construction or unevennesses of surfaces upon which the bed stands are compensated for.

When the bed is being opened, the tension of the springs upon the pivot-shaft and the springs connected between the end of the frame and the case balance its weight, so that it moves slowly and evenly, and these same springs aid in lifting when the bed is being folded up. As the seat is connected with the bed, these springs also counterbalance part of the work necessary in moving the seat. The spring 33 prevents the seat from moving violently in opening and aids in closing the seat, while the springs 35 tend to keep the end of the bar 28 as far as possible from the axis of the pivot of the bed. To the bottom of the bed a cushion 36 is usually secured by any suitable upholstering to provide a comfortable back for the seat when the bed is raised, and this cushion lies within the case when the bed is down. A bed provided with these spring connections arranged in this manner can be turned up or down with but little effort, and the turning of the bed automatically moves the seat from a position in which it forms a support for the bed to a position which affords a couch, lounge, or settee. The counterbalancing-springs are light in weight, simple, inexpensive, and can be readily assembled or can be easily replaced in case of wear.

I claim as my invention—

1. In a bed of the within-described class, in combination, a case, a bed-frame mounted upon a pivot supported by the case, mechanism for counterbalancing the weight of the bed-frame, a seat-frame hinged at one edge to the case, and levers connected with the bed-frame and the free edge of the seat-frame whereby the oscillation of the bed-frame on its pivot reverses the seat-frame on its hinges, the seat-frame when turned down forming a support for the bed-frame and when turned up forming a seat, substantially as specified.

2. In a bed of the within-described class, in combination, a case, a bed-frame mounted upon a pivot supported by the case, yielding connections between the bed-frame and the case for counterbalancing the weight of the bed-frame, a seat-frame hinged at one edge to the case, and yielding connections between the bed-frame and the seat-frame whereby the oscillation of the bed-frame on its pivot reverses the seat-frame on its hinges, the seat-frame when turned down forming a support for the bed-frame and when turned up forming a seat, substantially as specified.

3. In a bed of the within-described class, in combination, a case, a bed-frame mounted upon a pivot supported by the case, spiral springs mounted upon the pivot and connected with the bed-frame and springs connecting the bed-frame with the case, for counterbalancing its weight, a seat-frame hinged at one edge to the case, an oscillating lever connected with the free edge of the seat-frame, and a link connecting the bed-frame with the lever whereby the oscillation of the bed-frame on its pivot reverses the seat-frame on its hinges, the seat-frame when turned down forming a support for the bed-frame and when turned up forming a seat, substantially as specified.

4. In a bed of the within-described class, in combination, a case, a bed-frame mounted upon a pivot supported by the case, mechanism for counterbalancing the weight of the bed-frame, a seat-frame hinged at one edge to the case, a spring-lever pivotally supported by the case and loosely connected with the

seat-frame, and a link connecting the bed-frame with the lever, substantially as specified.

5. In a bed of the within-described class, in combination, a case, a bed-frame mounted upon a pivot supported by the case, mechanism for counterbalancing the weight of the bed-frame, a seat-frame hinged at one edge to the case, a lever pivotally supported by the case with one end loosely connected with the free edge of the seat-frame, a link connecting the bed-frame with the end of the lever that is not connected with the seat-frame, and a spring connecting the case with the lever that is connected with the seat-frame, substantially as specified.

6. In a bed of the within-described class, in combination, a case, a bed-frame mounted upon a pivot supported by the case, spiral springs mounted upon the pivot and connected with the bed-frame and springs connecting the bed-frame with the case, for counterbalancing its weight, a seat-frame hinged to the case at one edge, an oscillating lever supported by the case, a rod attached to the seat-frame and loosely connected with one arm of the lever, a link yieldingly connected at one end with the bed-frame and loosely connected at the opposite end with the other arm of the lever, and a spring connected with the lever adjacent to the point of attachment of the link, substantially as specified.

7. In a bed of the within-described class, in combination, a case, a bed having side, head and foot boards, mounted upon a pivot supported by the case, shield-boards with their ends loosely held connected with the side boards of the bed and having a movement bodily edgewise toward and from the top edges of the side boards in order to widen or narrow the sides of the bed, and mechanisms for counterbalancing the weight of the bed, substantially as specified.

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Witnesses:

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