W. W. LAVANWAY & G. A. NENNO.

DISAPPEARING BED AND HOUSING THEREFOR.

APPLICATION FILED MAY 4, 1910.

1,039,967.

Patented Oct. 1, 1912.

3 SHEETS—SHEET 1.

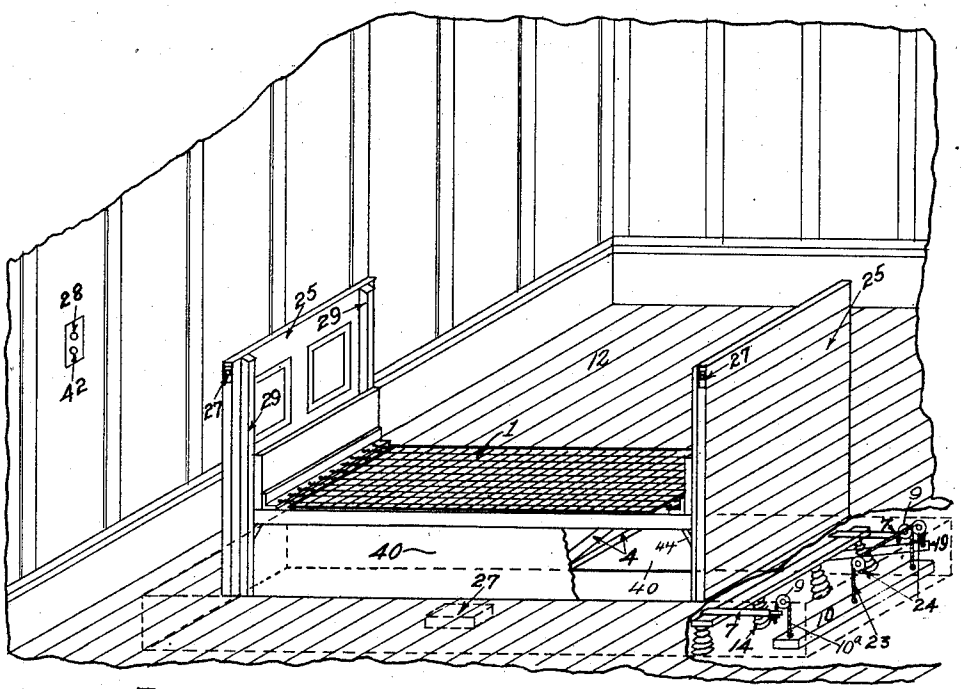

FIG. 1.

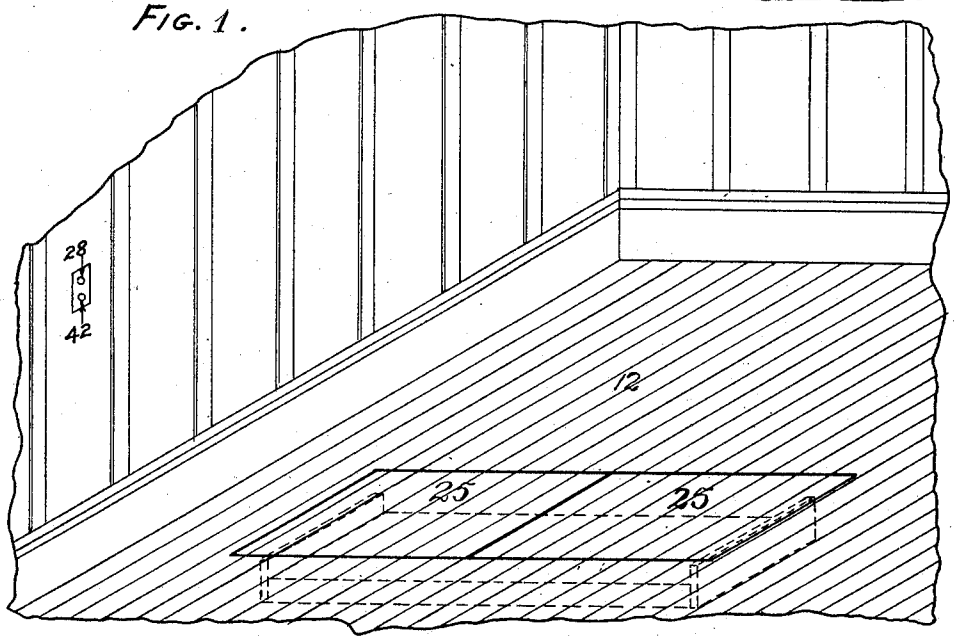

FIG. 2.

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3 SHEETS—SHEET 2.

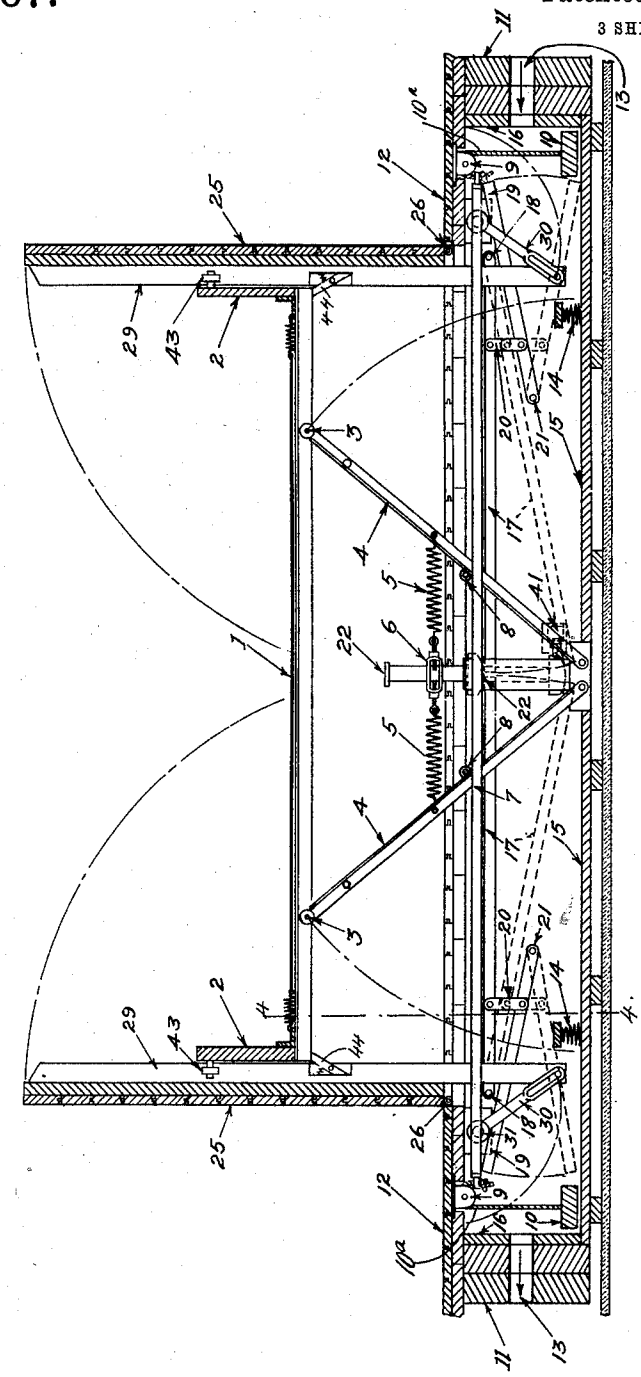

FIG. 3.

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3 SHEETS—SHEET 3.

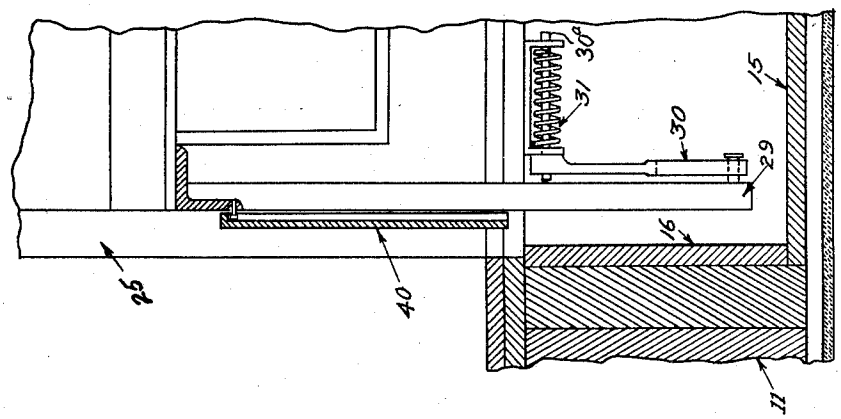

FIG. 5.

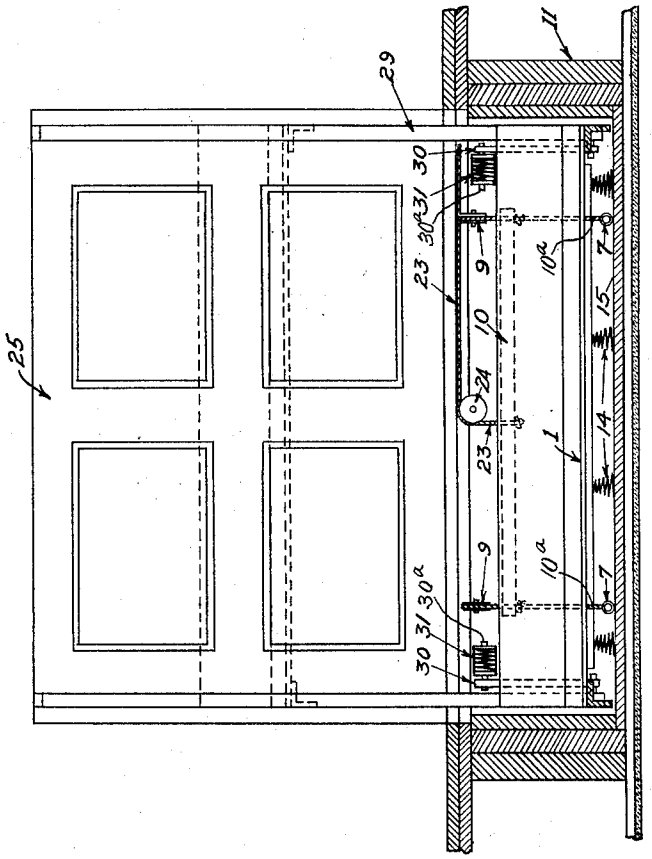

FIG. 4.

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DISAPPEARING BED AND HOUSING THEREFOR.

1,039,967. Specification of Letters Patent. Patented Oct. 1, 1912.

Application filed May 4, 1910. Serial No. 559,315.

To all whom it may concern:

Be it known that we, WILLIAM WALLACE LAVANWAY and GEORGE ANDREW NENNO, citizens of the United States, and residents of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Disappearing Beds and Housings Therefor, of which the following is a specification.

The main purpose of our invention is to provide, for apartment and dwelling houses, a bed structure which, when not in use, will not occupy any floor or wall space, but will be concealed from view in a casing beneath the floor; but which may be readily raised to a position above the floor when desired.

In carrying out our invention we arrange a casing between the floor of one room and the ceiling of the room below it, such casing comprising a rectangular structure arranged between the floor joists. In the floor of the room, immediately over this casing, is an opening, at the ends of which a pair of trap doors are hinged, these doors forming portions of the floor, when closed, and when opened serving as head and foot boards for the bed. When the trap doors are closed the floor is unbroken and as the mattress frame and operating parts are concealed from view, it is not apparent from the appearance of the room that it is used as a bed room, and no wall or floor space is taken up by the bed. When it is desired to use the bed, the trap doors and bed are released from their fastenings, the former swinging to an upright position and serving as head and foot boards for the bed, and the latter moving from its position beneath the floor to a position above the floor, ready for use.

The mattress frame, in our invention, always remains in horizontal position so that if the bed is made up before it is moved to its concealed position it will not require being made over again when brought into position for use. As the chamber in which the bed is stored is provided with ventilating openings the bed will be thoroughly ventilated while not in use.

In the drawing which illustrates our invention, Figure 1 is a perspective view of a portion of a room in a dwelling house or apartment showing a bed in its raised position; Fig. 2 is a similar view showing the trap doors closed, the mattress frame being indicated in dotted lines beneath the doors; Fig. 3 is a vertical longitudinal section taken through the casing at one side thereof, the bed being shown in its raised position; Fig. 4 is a transverse section through the casing on the line 4—4 of Fig. 3, the mattress frame being shown in its lowermost position in full lines and in its raised position in dotted lines; and, Fig. 5 is an enlarged sectional view, on the line 4—4 of Fig. 3, the mattress frame and most of the parts for moving the same being omitted.

Referring to the drawings 11 indicate joists arranged beneath the flooring 12 of a room and spaced a suitable distance apart to receive a casing which comprises a bottom 15 with side and end walls 16 which are suitably secured to the joists. Ventilating openings 13 are formed in the joists and the casing so that air may circulate through the casing, these ventilating openings being connected by suitable ducts (not shown) to the exterior of the building. In the flooring 12 of the room, above the casing, are arranged trap doors 25 connected to the stationary part of the flooring by concealed hinges 26. These trap doors normally lie flush with and form a part of the floor of the room and also form a cover for the casing beneath the floor. Each trap door is provided, on its under side, with a pair of guide rails 29, which, as shown, extend beneath the hinges 26 and form levers, the free ends of which are connected to cranks 30, by slot-and-pin connections. The cranks 30 are mounted upon short shafts 30^a upon which are arranged coil springs 31. When the trap doors are moved to closed position, the downwardly extended ends of the guide rails force the free ends of the cranks 30 toward the ends of the casing against the tension of the springs 31.

An electromagnetically controlled lock 27, indicated in Fig. 1, holds the trap doors normally closed against the action of the springs 31. When the trap doors are unlocked, as may be done by depressing a push button 28, the springs 31 swing the crank arms 30 and guide rails 29 so as to move the trap doors to the upright position shown in Fig. 3.

The mattress frame, indicated by the numerals 1 and 2, has, upon its end pieces 2, rollers 43 which bear against the sides of the guide rails 29 and guide the mattress

frame along said rails. Latches 44 are arranged within recesses in the guide rails, and when the mattress frame is moved to its upper position these latches spring out beneath the frame and support it.

When the trap doors are closed the mattress frame rests within the casing beneath the floor, as shown in full lines in Fig. 4. The mattress frame is locked in its lower position by means hereinafter described and after the trap doors have been released and have moved to their vertical positions the mattress frame is released by a separate operation and moves to its upper position.

As shown in the drawing, two pairs of levers 4, 4, are pivoted at the bottom of the casing and about midway between its ends, and these levers are provided at their free ends with rollers 3 which bear against the under sides of the longitudinal bars of the mattress frame. These pairs of levers, which incline in opposite directions, are connected together by springs 5 the tension of which may be adjusted by an interposed turnbuckle 6. It will be evident that the tendency of the springs 5 is to move the oppositely inclined levers toward one another and thus support the mattress frame. Rods 8, extending transversely of the casing, are secured to the pairs of levers 4 and beneath these rods, at each side of the casing, is a bar 7, the ends of which are connected to weights 10, by means of ropes or cables 10^a passing around pulleys 9 which are suspended beneath the floor 12. The weights 10 constitute the actuating means for raising the mattress frame when it is unlocked. Normally, when the mattress frame is in its lowermost position, the levers 4—4 are spread apart and the rods 7, under the bars 8 on said levers, are depressed to the bottom of the casing, and the weights 10 are raised, as shown in Fig. 4. Hence when the mattress frame is released from the locking means hereinafter mentioned, the trap doors, having previously been released, the weights 10 and springs 5 will at once move the mattress frame to the position shown in Fig. 3, past the spring latches 44, which will lock said frame against downward movement.

In order to permit the mattress frame to descend from its upper to its lowermost position, we provide means, operated by a foot bolt 22, for raising the weights 10 so that the rods 7 may fall by gravity and thus relieve the upward pressure against the rods 8 on the levers 4. As shown in the drawing, a pair of levers 17 is arranged longitudinally of the casing, at one side, these levers being connected to pivot pins 18 on the side of the casing and having their free ends arranged beneath the bolt 22. The levers 17 are connected by links 20 to shorter levers 19 pivoted at 21. The free ends of the levers 19 are connected by rods or cables 23, passing over pulleys 24, to the central portions of the weights 10. It will be evident that when the foot bolt 22 is depressed the levers 17 and 19 will be moved from the full line to the dotted line positions, in Fig. 3, and will lift the weights 10 and thereby permit the rods 7 to fall. When the levers 17 are depressed and the weights 10 raised these levers are locked in their depressed position by an electromagnetic lock 41 which engages the foot bolt 22, which lock may be released by operating a push button 42 (Fig. 1).

Assuming the bed to be in its raised position, shown in Figs. 1 and 3, when it is desired to conceal the bed the foot bolt 22 is depressed, causing the weights 10 to be raised and the rods 17 to move downward. The latches 44 are then pressed inward allowing the mattress frame to rest upon the levers 4—4 which form a yielding support for the bed, these levers being connected by the springs 5. The bed may then be pushed down by hand against the action of the springs 5 until the mattress frame rests upon the spring buffers 14 at the bottom of the casing. As the levers 4—4 approach the horizontal position the springs 5—5 approach a position parallel with the levers and therefore the lifting power of the springs is not increased by the greater tension applied to them when the levers are in the horizontal position. The trap doors 25, which form the head and foot boards for the bed may then be closed and they will be locked in their closed position by the lock 27. In moving the trap doors to closed position, the springs 31 are put under tension so that when they are again unlocked these springs will return the doors to the upright position. Then, to elevate the mattress frame the foot bolt is unlocked and levers 17 and 19 are released, permitting the weights 10 to move downward and raise the bars 7, which, pressing upward against the bars 8 on the levers 4, raise the latter levers and by means of said levers the mattress frame is raised above the latches 44 which support the mattress frame while in use.

From the foregoing it will be seen that the bed when in closed position is entirely concealed from view beneath the floor and that no floor or wall space is occupied by the bed or its housing; also that the bed is always held in horizontal position so that after the bed has been made up the bed clothing is not disturbed by the folding of the bed; also that the bed, while in its casing, is continually ventilated through ventilating apertures external to the sleeping room. It will also be seen that the operation of raising the bed is entirely automatic and that very little manual labor is required to return the bed to its closed position.

Curtains may be used at the sides of the

mattress frame to prevent rats and mice from entering the sleeping room from the apertured casing beneath the floor, and also to prevent drafts of air from flowing through said casing into the room, as well as to improve the appearance of the bed after it has been set up, and to prevent children from falling through the opening in the floor. In Figs. 1 and 4 detachable curtain boards 40 are shown extending between the trap doors, at the sides of the bed and depending from the mattress frame.

What we claim is:

1. The combination with a floor having an opening therein and a pair of trap-doors hinged at opposite ends of said opening to close the same, of means for holding said doors in vertical position, a bed bottom movable through the opening, and means for supporting the bed bottom, at its ends, on said doors, when the bed bottom is raised.

2. The combination with a floor having an opening, doors for closing said opening, and a bed bottom movable through the opening, of means for automatically moving said doors to open position, independent means for automatically raising said bed bottom through the opening, and means on said doors for supporting the bed bottom in raised position.

3. The combination with a floor having an opening and a closure for said opening, of a bed bottom movable through the opening, means for locking said bed bottom in position below the floor, and means for automatically raising said bed bottom through the opening when unlocked.

4. The combination with a floor having an opening therein and a pair of trap doors hinged at opposite edges of said opening, of means for locking the doors in closed position, means for automatically raising the doors to vertical position when unlocked, a bed bottom adjustable vertically through said opening and means upon said doors for supporting the bed bottom when the doors are in vertical position.

5. The combination with a floor having an opening therein and a pair of trap doors hinged at opposite edges of said opening, of means for locking the doors in closed position, means for automatically raising the doors to vertical position when unlocked, a bed bottom adjustable vertically through said opening, means for locking said bed bottom in position beneath the floor, and means for automatically raising said bed bottom to a position above the floor when the bed bottom is unlocked.

6. The combination with a floor having an opening therein and a pair of trap doors hinged at opposite edges of said opening. of means for locking the doors in closed position, means for automatically raising the doors to vertical position when unlocked, a bed bottom adjustable vertically through said opening, means for locking said bed bottom in position beneath the floor, means for automatically raising said bed bottom to a position above the floor when the bed bottom is unlocked, and means upon said doors for supporting the bed bottom when the doors are in vertical position.

7. The combination with a floor having an opening therein and a pair of trap doors hinged at opposite ends of said opening, of levers connected to said doors and projecting beyond their hinged ends, cranks connected to the ends of said levers, springs to swing said cranks to open the doors, a bed bottom adjustable vertically through said opening and means on said doors for supporting the bed bottom.

8. The combination with a floor having an opening therein, and trap doors hinged at opposite ends of said opening, of a bed bottom movable through the opening and means for lifting said bed bottom, comprising a rod extending from end to end of the opening, counterweights attached to the ends of said rod, a pair of levers pivoted below the floor and midway between the ends of said opening, the free ends of said levers engaging the bed bottom and said levers having parts resting upon the upper side of said rod.

9. The combination with a floor having an opening therein, and trap doors hinged at opposite ends of said opening, of a bed bottom movable through the opening, and means for lifting said bed bottom comprising a rod extending from end to end of the opening, counterweights attached to the ends of said rod, a pair of levers pivoted below the floor and midway between the ends of said opening, the free ends of said levers engaging the bed bottom, said levers having parts resting upon the upper side of said rod and a spring connecting said levers together.

10. The combination with a floor having an opening therein, and trap doors hinged at opposite ends of said opening, of a bed bottom movable through the opening, counterweights and connections for lifting said bed bottom through the opening, and means, operating independently of said connections, for raising the counterweights, to permit the bed bottom to move downwardly through said openings.

11. The combination with a floor having an opening therein and trap doors hinged at opposite ends of said opening, of a bed bottom movable through the opening, counterweights and connections for lifting said bed bottom through the opening, and means, operating independently of said connections, for raising the counterweights, to permit the bed bottom to move downwardly through said opening, said means

comprising levers hinged beneath the floor near the ends of said opening, a foot bolt for depressing the free ends of said levers and connections between said levers and counter-weights.

12. The combination with a floor having an opening, and trap doors hinged at opposite edges of said opening, of a bed bottom movable through the opening and adapted to fit between said doors when the latter are raised to vertical positions, and curtain-boards adapted to fit between the doors at the sides of the bed bottom when the doors and bed are in their raised positions.

In testimony whereof we hereunto set our hands at San Francisco, California, this 26th day of April, A. D. 1910.

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GEORGE ANDREW NENNO.

Witnesses:
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