J. F. HUNT.

AUTOMATIC FOLDING SEAT.

APPLICATION FILED DEC. 28, 1914.

1,237,647. Patented Aug. 21, 1917.

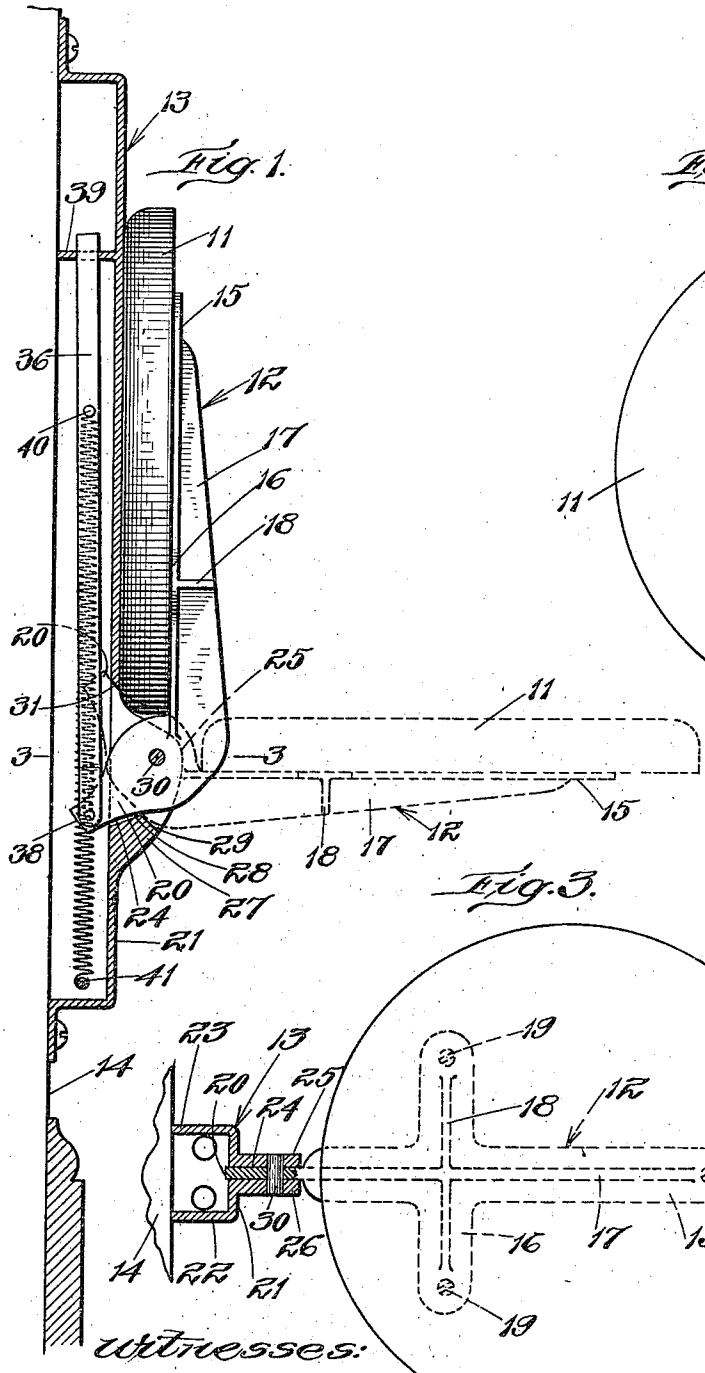

Fig. 1.

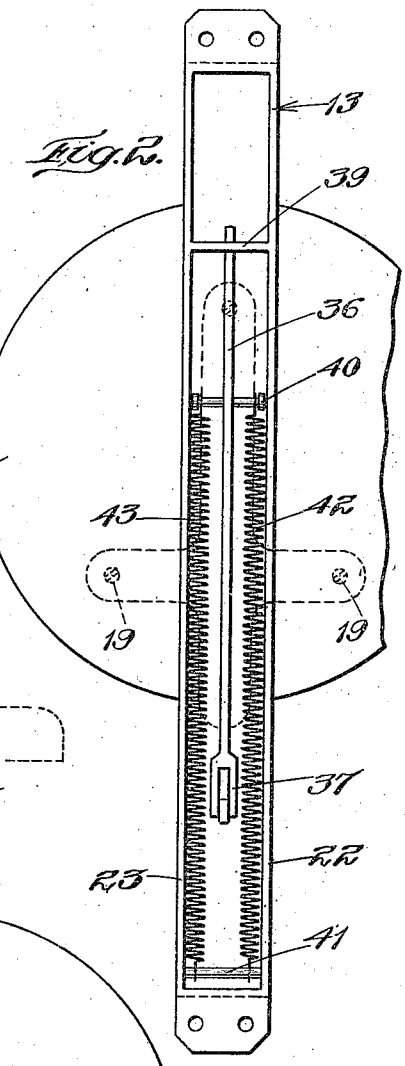

Fig. 2.

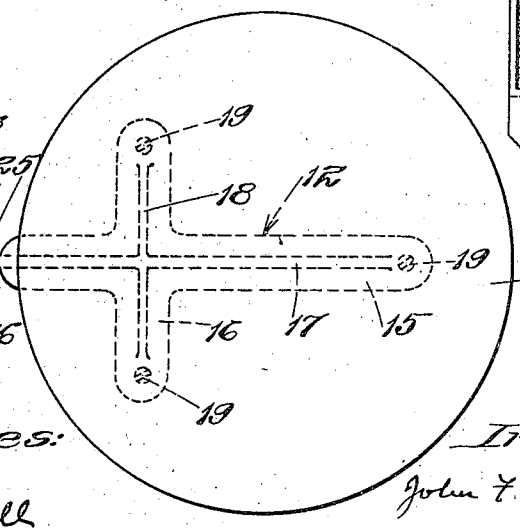

Fig. 3.

Witnesses:

Helen M. Purcell

John H. Parker

Inventor.

John F. Hunt

By Thacher, Calvin, Copeland & Clarke

Attys.

UNITED STATES PATENT OFFICE.

JOHN F. HUNT, OF MALDEN, MASSACHUSETTS.

AUTOMATIC FOLDING SEAT.

1,237,647. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed December 28, 1914. Serial No. 879,305.

To all whom it may concern:

Be it known that I, JOHN F. HUNT, a citizen of the United States, residing at Malden, State of Massachusetts, county of Middlesex, have invented a certain new and useful Improvement in Automatic Folding Seats, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object the production of a new and improved form of automatic folding seat or stool which is so constructed and arranged that it is both compact and durable. Heretofore so far as known to me there has been no automatic folding seat devised which is sufficiently strong and durable to stand the ordinary wear and tear of usage to which such devices are customarily subjected, and which at the same time is compactly constructed so that it occupies a minimum of space. In all devices of compact structure heretofore produced so far as known to me it has been necessary to employ either a relatively short spiral spring or a flat spring. I have found that such devices do not adequately serve the purposes for which they are intended for the amount of movement necessary to bring the seat into folded position is so great relatively to the length of the spring that it is subjected to a severe strain which results in early breakage. Furthermore the relatively light and uniform pressure which is essential to the easy and smooth operation of the device is very difficult to obtain where short spiral springs or flat springs are used. Compact automatic folding seats as heretofore constructed therefore do not give the smooth operation desired and do not stand up for any length of time under the customary wear and tear of usage.

My object is to produce a compact form of self folding seat which is so constructed and arranged that it may be provided with a relatively long spiral spring so that it will readily take care of the necessary movement without being subjected to an undue strain and will apply a substantially uniform power throughout the folding movement.

As shown in the accompanying drawings the device embodying my invention is particularly designed to be secured to a vertical support such as the wall of a room so that it is adapted for use in narrow passages as in rear of store counters or in other constricted spaces. It however may be equally well employed in other places such for example as in elevators, theaters, automobiles, and as a motorman's seat in electric cars. The supporting member is arranged to completely inclose the folding mechanism and the compact structure enables it to be placed on a wall or like support without interfering with the base board or other similar projection which may protrude slightly from it. It will be seen that the said supporting member does not of necessity extend below the base board and therefore may be put in place without occupying any space on the floor or cutting the base board.

My invention will be fully understood from the following description when taken in connection with the accompanying drawings and the novel features thereof will be clearly pointed out and defined in the claims at the close of the specification.

In the drawings Figure 1 is a side elevation partly in section showing a device embodying my invention secured to the wall of a room.

Fig. 2 is a rear elevation of the device shown in Fig. 1.

Fig. 3 is a top plan view of the seat in horizontal position, the supporting and folding mechanism being shown in section taken on line 3—3 in Fig. 1.

Having reference to the drawings—, there is shown at 11 a suitable stool top or seat of usual form carried on a seat supporting arm 12 which is in turn pivotally mounted on a U-shaped channel bar support 13 secured to the wall 14. The seat 11, which is preferably round as shown, rests on the arm 12 which may have a seat supporting end of any suitable form but preferably consists of a member 15 extending centrally beneath the seat 11 and a cross-member 16 which coöperates with the member 15 to hold the seat firmly in position. The member 15 and the cross-member 16 are provided with suitable strengthening webs 17 and 18 as shown and are secured to the stool top 11 by screws 19. The web 17 tapers toward its outer end and is provided at its thicker inner end with an arm extension 20 which extends within the U-shaped channel member 13 and is arranged at an angle with the supporting arm for reasons hereinafter to be described.

The supporting member 13 is hollow and may conveniently be U-shaped in cross-section as shown in Fig. 3 there being a front surface 21 and sides 22 and 23. In the

front surface 21 I provide a slot 24 which is of sufficient width to make a free sliding fit with the arm extension 20 which is adapted to extend through the slot, its inner end projecting within the U-shaped channel member 13. At the sides of the slot are two parallel ears 25 and 26 to support the pivot for the arm slightly forward of the front surface 21. Between the ears 25 and 26 at the lower end thereof is a filler member 27 having an inwardly inclining surface 28 and an outwardly inclining surface 29 for purposes hereinafter to be set forth. The seat supporting arm 12 is pivotally mounted within the ears on a suitable pin 30 the slot 24 being of sufficient length so that the seat may be swung into upright position or into a horizontal position as shown in full and in dotted lines respectively in Fig. 1. The front surface 21 of the channel supporting member 13 inclines outwardly and downwardly at the upper end of the slot 24 as shown at 31. When the seat 11 is in the horizontal position shown in dotted lines the arm extension 20 bears against the surface 31 on one side and against the surface 29 of the filler member 27 on the other side. I regard this feature as important for the downward pressure exerted on the seat when a person sits on it is withstood by the surface 31 on one side of the arm extension 20 and by the surface 29 on the opposite side. This relieves the pivot 30 of all unnecessary strain thereby increasing the strength and efficiency of the device.

It will be noted that the point of pivot 30 is at some distance from the front surface 21 of the channel bar support 13. This is important for it permits the arm extension 20 to extend at some distance behind the pivot thereby increasing the leverage and correspondingly decreasing the power necessary to raise the seat. The ears forming the pivotal point for the seat are preferably cast integral with the U-shaped channel member for purposes of convenience but obviously may comprise a separate bracket plate if desired.

The inner end of the arm extension 20 which projects within the U-shaped member 13 connects with a strut 36 having a bifurcated lower end 37 which spans the arm extension 20 and is secured thereto by a pivot pin 38. The upper end of the strut makes a loose fit with a hole in a guiding web 39 and carries at some distance from its end a cross pin 40. The guide web 39 and strut 36 are preferably so arranged that when the seat is in upright position the end of the strut projects slightly above the web, the strut not being sufficiently long to reach the upper end of the channel member 13 when the seat is in horizontal position. At the lower end of the channel member 13 I provide a cross pin 41 which is at some distance from the cross pin 40 on the strut 36. A pair of springs 42, 43 are secured at each end to the cross pins, one at each side of the strut 36 as is clearly shown in Fig. 2. When weight is removed from the seat 11 the pressure exerted on the strut by the springs causes it to push downwardly against the arm extension 20 and consequently to raise the seat into the upright position shown. While I have shown in the drawings two springs I do not limit myself to this number. This, however, is a convenient arrangement because the springs may be placed on opposite sides of the strut.

I regard the seat actuating mechanism as one of the most important features of my invention for by the arrangement of parts shown I am enabled to obtain a spiral spring of such length that the movement of the arm extension is relatively small in comparison with the total movement possessed by the spring. The required movement, therefore, does not place the spring under any particular strain so that the life of the spring is relatively great. Furthermore the pressure exerted by the spring throughout the required movement is practically constant which gives a free, easy and substantially uniform movement to the seat. At the same time the mechanism is so arranged that the device is compact the working room of the spring being practically on a level with that of the seat. The U-shaped channel member is therefore relatively short so that it may be placed against a wall at the proper height and above the base board of the room. While I have shown my device in the preferred form as being adaptable to be secured to a wall it is obvious that the supporting member may be secured to any other vertical support and I therefore do not wish to limit myself to the specific construction shown.

What I claim is:

1. An automatic folding seat comprising a frame adapted to be secured to a wall and formed with a vertical slot in the front face thereof, two ears projecting out beyond the front of the frame from the two sides of the said slot, a bracket lever fulcrumed between said ears, said lever being capable of being turned on its pivot, one end of the lever projecting through said slot into the hollow interior of said frame, a vertical rod slidable in said frame the lower end of which is pivoted to the inner end of said bracket lever, a guide for the free end of said rod, the said bracket lever on the outer side of said fulcrum having a seat supporting arm, a seat member secured to said supporting arm, a spring in the frame and acting on said rod in such manner that it normally holds the said rod in its lowermost position and thereby holds said bracket lever in such a position that the said seat member is turned up at the front of the frame, and

means for limiting the downward movement of the seat member.

2. An automatic folding seat comprising a frame constructed to be secured to a wall and formed with a hollow interior and a vertical slot in the front face thereof opening into said hollow interior, two ears projecting out beyond the front of the frame from the two sides of said slot, a bracket lever fulcrumed between said ears on a pivot which is in front of the front plane of the frame, said lever being capable of being turned on its pivot, one end of said lever projecting through said slot into the hollow interior of said frame, a rod slidable in said frame the lower end of which is pivoted to the inner end of said bracket lever and the other end of which is guided by a fixed member having a hole therein in which the end of said rod loosely fits, the said bracket lever on the outer side of said fulcrum being bent to form a seat supporting arm, a seat member secured to said supporting arm, a coil spring in the hollow interior of the frame one end of which is secured to one end of said rod the other end of said spring being secured stationary to said frame, said spring acting on said rod in such manner that it normally holds the said rod in its lowermost position and thereby holds said bracket lever in such a position that the said seat member is folded up in front of the frame, and means for limiting the downward movement of the seat member.

3. An automatic folding seat comprising a hollow case secured in a vertical position on a wall, and formed with a vertical elongated slot in the front face thereof, two ears projecting out beyond the front of the case from the two sides of the said slot, a bracket lever fulcrumed intermediate its ends between said ears on a pivot which is in front of the front plane of the case, said lever being capable of being turned on its pivot, one end of the lever projecting through said slot into the hollow interior of said case, a rod slidable in said case the lower end of which is pivoted to the inner end of said bracket lever, a guide member having a hole therein in which the free end of said rod is received, the said bracket lever on the outer side of said fulcrum being bent to form a seat supporting arm, a seat member secured to said supporting arm, a long coil spring in the case, one end of said spring being secured to the said rod near the upper end thereof, and the other end of said spring being secured stationary in the lower part of the case, the tension of the spring being such that normally it holds said bracket lever turned in such position that the seat member is turned up against the front face of the case, and means for limiting the downward turning movement of the seat member.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. HUNT.

Witnesses:
CAMERON MACLEOD,
ALICE H. MORRISON.