S. M. EISNER.

SPRING HINGE.

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1,172,267.

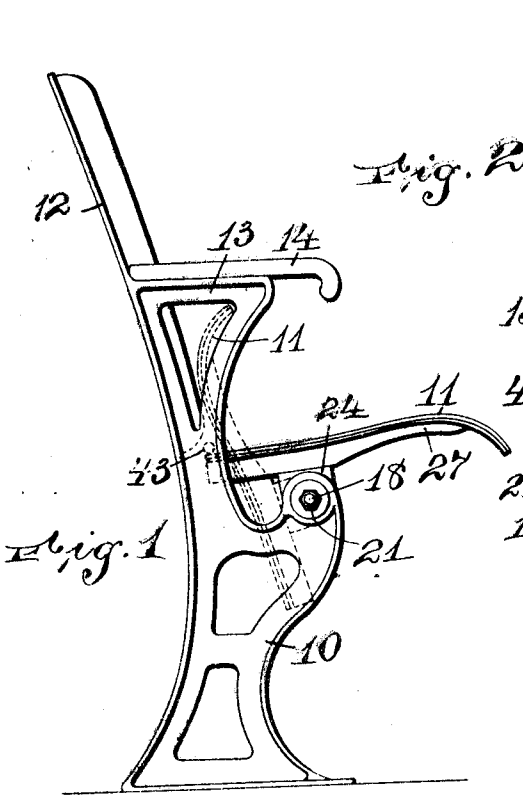


Fig. 1

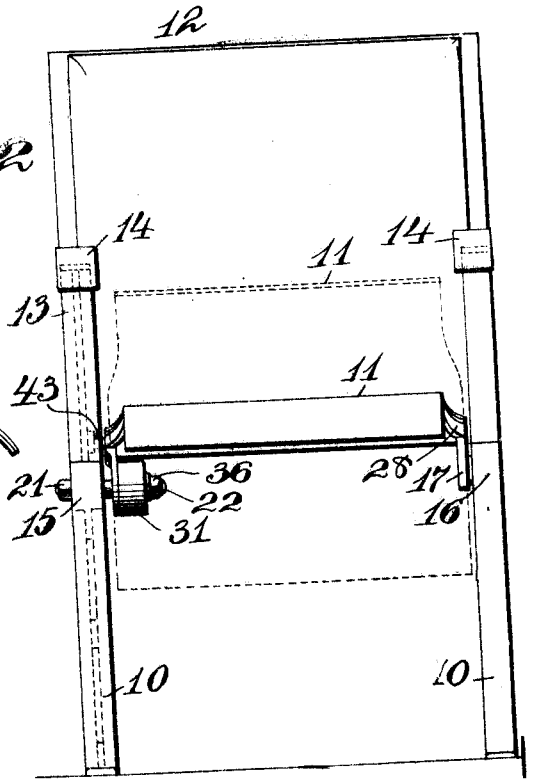


Fig. 2

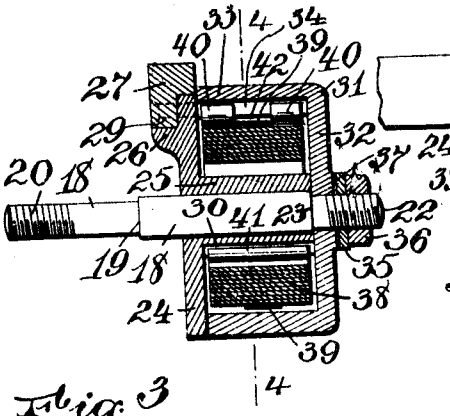


Fig. 3

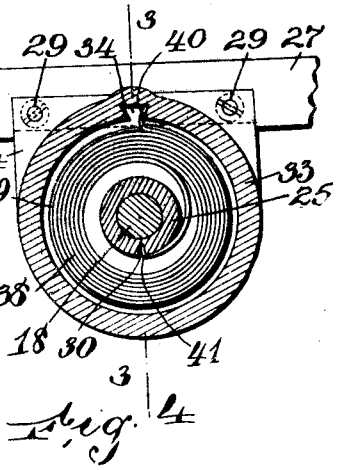


Fig. 4

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UNITED STATES PATENT OFFICE.

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SPRING-HINGE.

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To all whom it may concern:

Be it known that I, SAMUEL M. EISNER, a citizen of the United States, and a resident of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

This invention relates to an improved spring hinge and is adapted for use in all articles of furniture or similar fittings in which a platform, such as a seat or bench, is swung automatically out of the way when a weight which it is adapted to support is removed from it. In the case of a chair or bench, the person occupying it will hold the platform part of the article down, but when the weight of the person is removed, the bench or seat will automatically and silently be swung upward so as to give a wider passage between the article and the next adjacent one.

The invention is designed to provide a mounting or pivotal connection for such platform, which connection is adapted to be made cheaply and to be efficient, the device having but few parts and being constructed to provide quick and easy access to the interior thereof for repairs or new installation.

A further object of the invention is to provide an article of this kind which it is easy to adjust so that a spring used to swing the seat upward can be adjusted so that the seat is raised with the proper speed and the adjustment also permits the raising of a seat without unnecessary noise, due to any quick raising of the platform.

A further object of the invention is the provision of a spring and also its connection with a casing by which it is inclosed whereby the spring can be removed with little loss of time and it can also be adapted to be attached and detached to and from the elements that it bears against or is designed to operate.

The invention is illustrated in the accompanying drawing in which it is illustrated as applied to a seat such as is used in theaters and similar edifices, although it will be evident that the device can be adapted for different uses, such as on automobile chairs, kneeling benches and in fact any article of furniture in which a platform can be automatically folded up out of the way when the person using it removes his weight from it.

In the drawing Figure 1 is a side view of a chair showing my invention as applied thereto. Fig. 2 is a front view of the chair shown in Fig. 1. Fig. 3 is a detail section taken through the center of the pivotal connection between the frame or support of the chair and its platform which in this case forms the seat, this section being taken on line 3—3— in Fig. 4. Fig. 4 is a similar view taken on line 4—4 in Fig. 3.

In the drawing I have illustrated the device as applied to a chair comprising a frame 10 which forms the support of the seat portion 11, the frame 10 being of any usual type, the form shown having a back 12 and brackets 13 on which the arms 14 are supported. On the frame 10 are the bosses 15 and 16, one boss 16 having a plain pivotal mounting 17 on which the seat 11 is supported on one side, and the boss 15 having my improved hinged device, one being usually sufficient for an ordinary seat or any other form of platform of a medium size, although it will be evident that with larger structures more than one of my improved devices may be necessary. In the boss 15 is arranged a pintle 18 which has a shoulder 19 thereon to limit its entrance into the boss and has a screw-threaded end 20 on which a nut 21 is screwed to fasten it in place, although other means of fastening the pintle can be employed. The pintle 18 has its outer end reduced as at 22 whereby a shoulder 23 is formed toward the outer end of the pintle. Rotatably arranged on the pintle is a plate 24 having a boss 25, the boss forming the sleeve fitting around the pintle 18, the plate 24 extending upward and preferably having a shelf 26 tangential to the pintle, the shelf forming a support on which is mounted an arm or bar 27 which acts as a brace or bracket on one side of the platform which in this case is the seat portion 11, the other side of the seat being supported by a similar arm or bracket 28 which is adapted to rotate on the pivotal connection 17. The arm 27 is secured to the plate 24 by any suitable means, the form shown employing the screws 29. The boss 25 is slotted as at 30 in a transverse slot, the purpose of which will be described hereinafter.

On the reduced part 22 of the pintle is mounted a barrel 31 which comprises an end plate 32 and a flange 33, the flange being adapted to abut or nearly abut on the outer

face of the plate 24. The barrel 31 has a transverse slot 34 arranged therein, the purpose of this slot being described hereinafter. The end plate 32 is limited in its movement when it is slid onto the pintle by its engagement with the shoulder 23. A washer 35 is arranged in the reduced part 22 of the pintle and is adapted to be pressed against the end plate of the barrel by the nut 36, although other pressure applying means can be employed.

On the opposed faces of the washer 35 and the end plate 32 are coacting means for preventing their relative rotary movement when they are pressed together, this means usually consisting of ribs 37 on the opposed faces, these ribs being usually radial, although other arrangements may be made so that when the nut is tightened up the barrel is held against rotation. Within the barrel I place a coiled spring 38 which is surrounded by a wire or band 39 so that the spring is coiled to an extent and is held against uncoiling by the band so that the spring is easily handled. The outer end of the spring is hook-shaped as at 40, and the inner end is also hook-shaped as at 41.

When the device is placed on a chair, the plate 24 is first put in place and attached to the seat and is permanently affixed in its place and is held against withdrawal from the pintle unless it is removed from the seat portion, or unless the other end of the seat is detached from the chair. The spring is then laid in the barrel with its hooked end 40 slid into the slot 34 and the barrel is then slid onto the pintle from the small end 22 and by turning it slightly, the operator can soon find the slot 30, and the hooked end 41, when it is in line with the slot, permits the sliding of the spring and the barrel onto the pintle until the plate 32 abuts against the shoulder 23, when the washer 35 is put in place and the nut 36 placed on the screw-threaded end 22 of the pintle. The barrel is then held in one hand and turned, usually while the seat is in its raised position, until the tension on the spring is proper and when the nut 36 is screwed up it binds the barrel against any rotative movement on the pintle, but the shoulder 23 prevents this pressure being transmitted to the plate 24 so that the plate 24 is free to move. The device is now operative and whenever the seat 11 is pulled down, the spring has more tension applied to it, and when the person using the seat arises, the seat silently and promptly returns to its upright position which is shown in dotted lines in Figs. 1 and 2. If the tension of the spring is too strong, by merely loosening the nut 36 the barrel 31 can be turned by the hand to change the tension of the spring so that it can be quickly adjusted, and in a similar manner if a spring becomes weak through long use, it can be tightened very quickly in this manner.

I prefer to make the end 40 with a pair of hooks shown in the drawing, these being separated by a recess 42 which provides a passage for the band 39 between the hooks 40, as will be evident.

My device can be attached to old types of chairs by inserting the pintle in the chair at the place where the chair was previously pivoted, and when the seat portion is attached to the plate 24 the chair is transformed from an old type of chair to my improved article in which the seat will automatically swing upward when there is no weight on it. The downward movement of the seat is limited by any of the usual means employed in chairs of this kind, the form shown comprising a stud 43 which is placed in the frame of the chair and which engages the back end of the seat and limits its upward movement, thereby limiting the downward movement of the forward part of the seat.

Having thus described my invention, I claim:

1. A hinge comprising a pintle, a plate having a boss thereon and rotatably mounted on the pintle, the pintle having a reduced end forming a shoulder, a barrel consisting of an end plate and a flange, the end plate abutting on the shoulder, a nut on the end of the pintle to hold the barrel in place, means for holding the barrel in adjusted positions, and a coiled spring within the barrel and having its inner and outer ends formed into hooks, the boss of the plate and flange of the barrel having transverse recesses into which the hooked ends of the spring are adapted to be slid.

2. A hinge comprising a pintle, a plate having a boss thereon and rotatably mounted on the pintle, a reduced end on the pintle forming a shoulder, a barrel consisting of an end plate and a flange, the end plate abutting on the shoulder, a nut on the end of the pintle to hold the barrel in place, means for holding the barrel in adjusted positions, a coiled spring within the barrel and having its inner and outer ends formed into hooks, the boss of the plate and the flange of the barrel having transverse recesses into which the hooked ends of the spring are adapted to be slid, and a band embracing the spring to limit the uncoiling of said spring so as not to exceed the inside diameter of the barrel.

3. A hinge comprising a pintle, a plate having a boss thereon and rotatably mounted on the pintle, a reduced end on the pintle forming a shoulder, a barrel consisting of an end plate and a flange, the end plate abutting on the shoulder, a nut on the end of the pintle to hold the barrel in place, means for holding the barrel in adjusted

positions, and a coiled spring within the barrel, the spring having its outer end recessed and bent up into hooks, a band passing around the spring and between the hooks to limit the uncoiling of the spring, the inner end of the spring being hook-shaped, the boss and the flange having transverse slots into which the hooked ends of the spring are adapted to be slid.

4. A hinge comprising a pintle, the pintle having a reduced screw-threaded end forming a shoulder on the pintle, a plate having a boss thereon, said plate rotating on the pintle, a tangentially arranged support on said plate, a barrel comprising an end plate and a flange, the open end of the barrel being closed by the plate, the boss and the flange having transverse slots therein, a coiled spring with its ends formed so as to enter the slots, a washer on the reduced end of the pintle, the washer and the end plate of the boss having co-acting means for locking them against relative rotative movement, the end plate abutting on the shoulder of the pintle, and a nut on the reduced end of the pintle and adapted to be screwed against the washer whereby the barrel can be fixed in different rotative positions to vary the tension of the spring.

5. An article of manufacture comprising a pintle, a plate having a boss thereon and rotatably mounted on the pintle, the plate being adapted to be held against movement longitudinally along said pintle, the plate having a tangentially arranged support at its top, a barrel consisting of an end plate and a flange, the pintle having a reduced portion over which the end plate fits, the end plate being adapted to bear against the shoulder formed by the reduced end of the pintle and thus being limited in its movement toward the plate, the boss and the flange having transverse slots therein, a nut on the reduced end of the pintle, means between the nut and the end plate of the flange for securing the flange in different adjusted positions, a coiled spring within the barrel, the coiled spring having its inner end bent into a hook to engage the slot of the boss and having its outer end recessed and turned to form double hooks to engage the slot in the flange, and a band encircling said spring and passing between the outer hooks.

In testimony that I claim the foregoing, I have hereunto set my hand, this 15th day of July, 1914.

SAMUEL M. EISNER.

Witnesses:
WM. H. CAMFIELD,
M. A. JOHNSON.