

March 8, 1932.

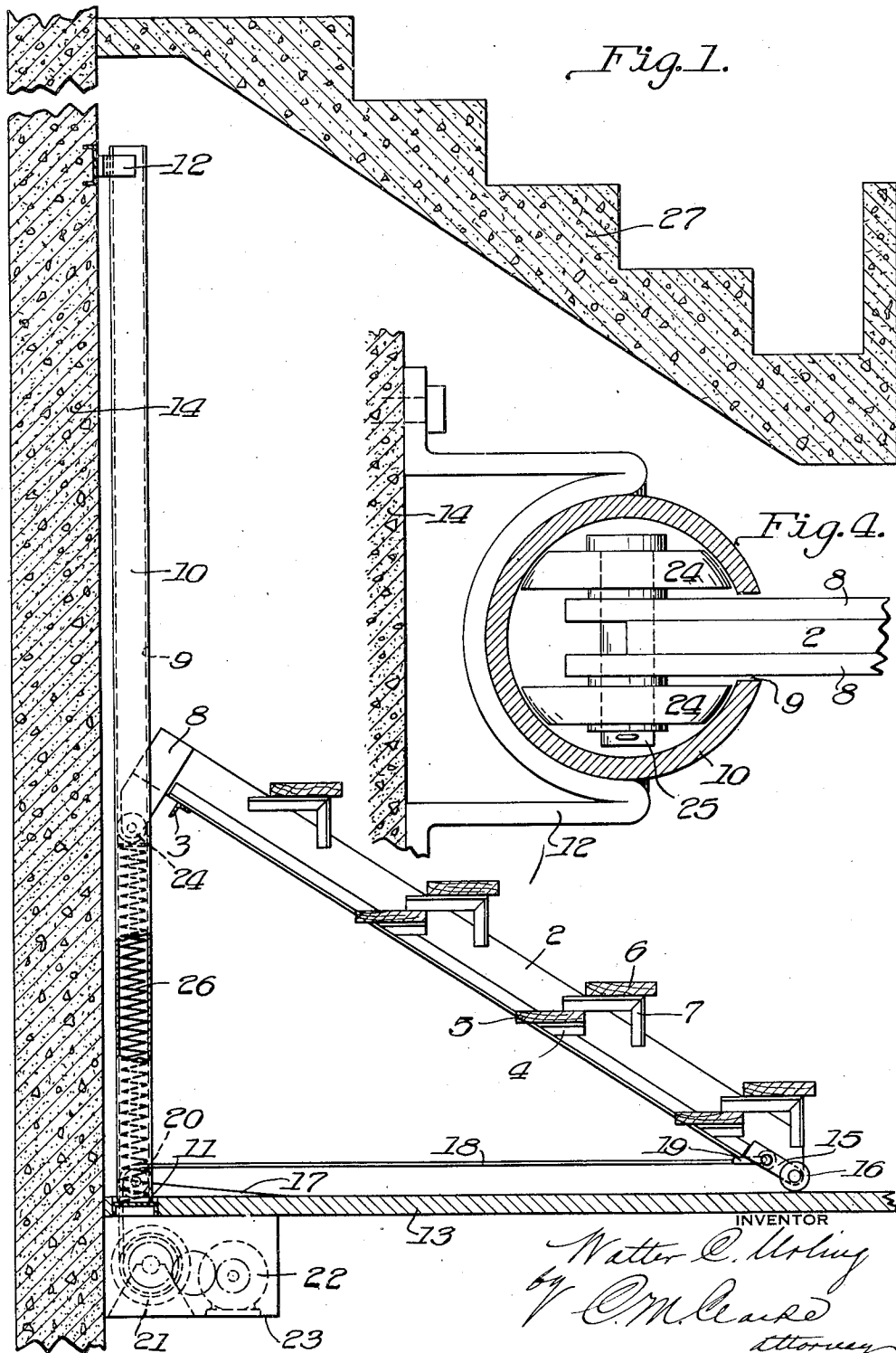
W. C. URLING

1,849,052

ADJUSTABLE AUDIENCE SEAT

Filed Jan. 21, 1930

4 Sheets-Sheet 1



March 8, 1932.

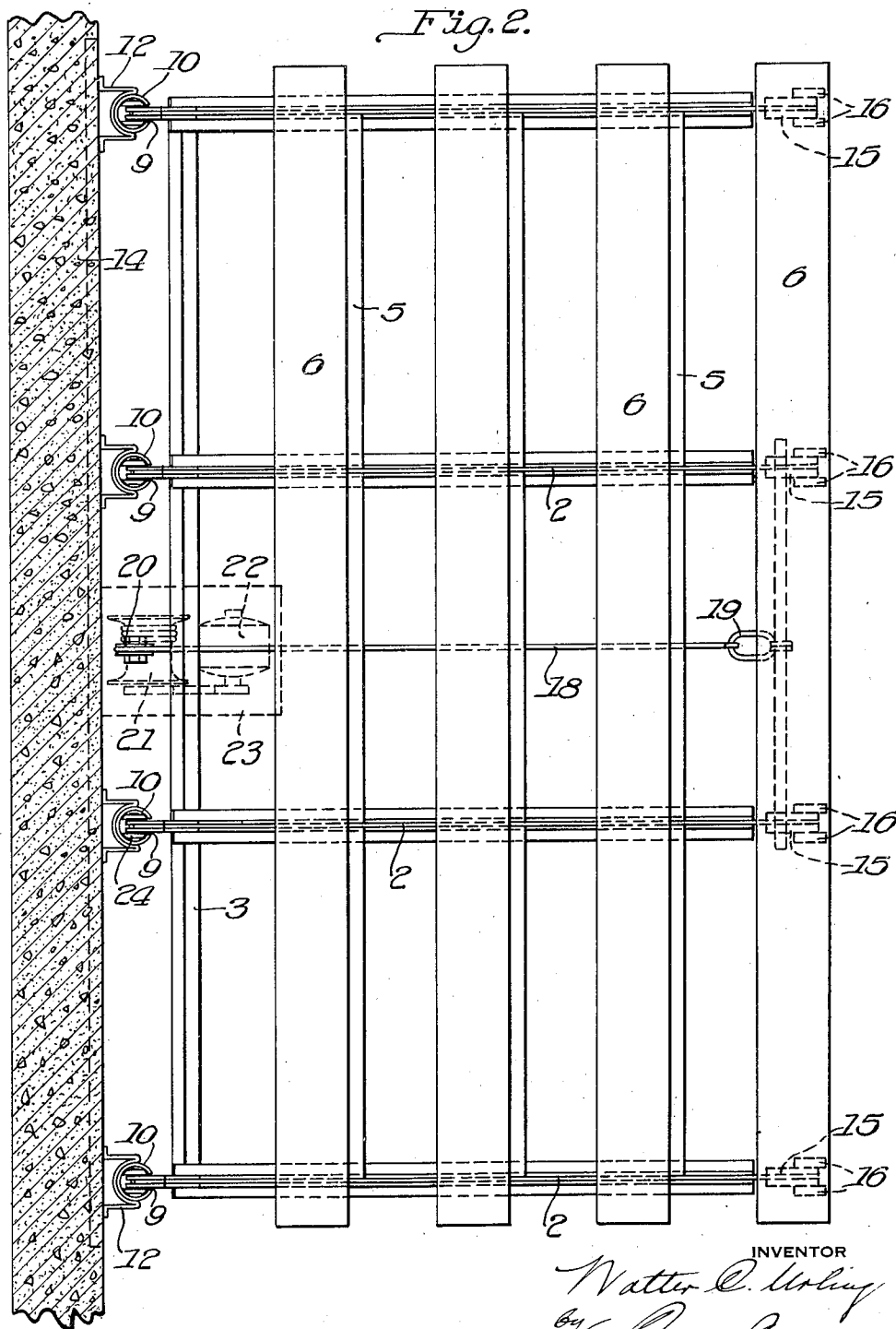
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ADJUSTABLE AUDIENCE SEAT

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March 8, 1932.

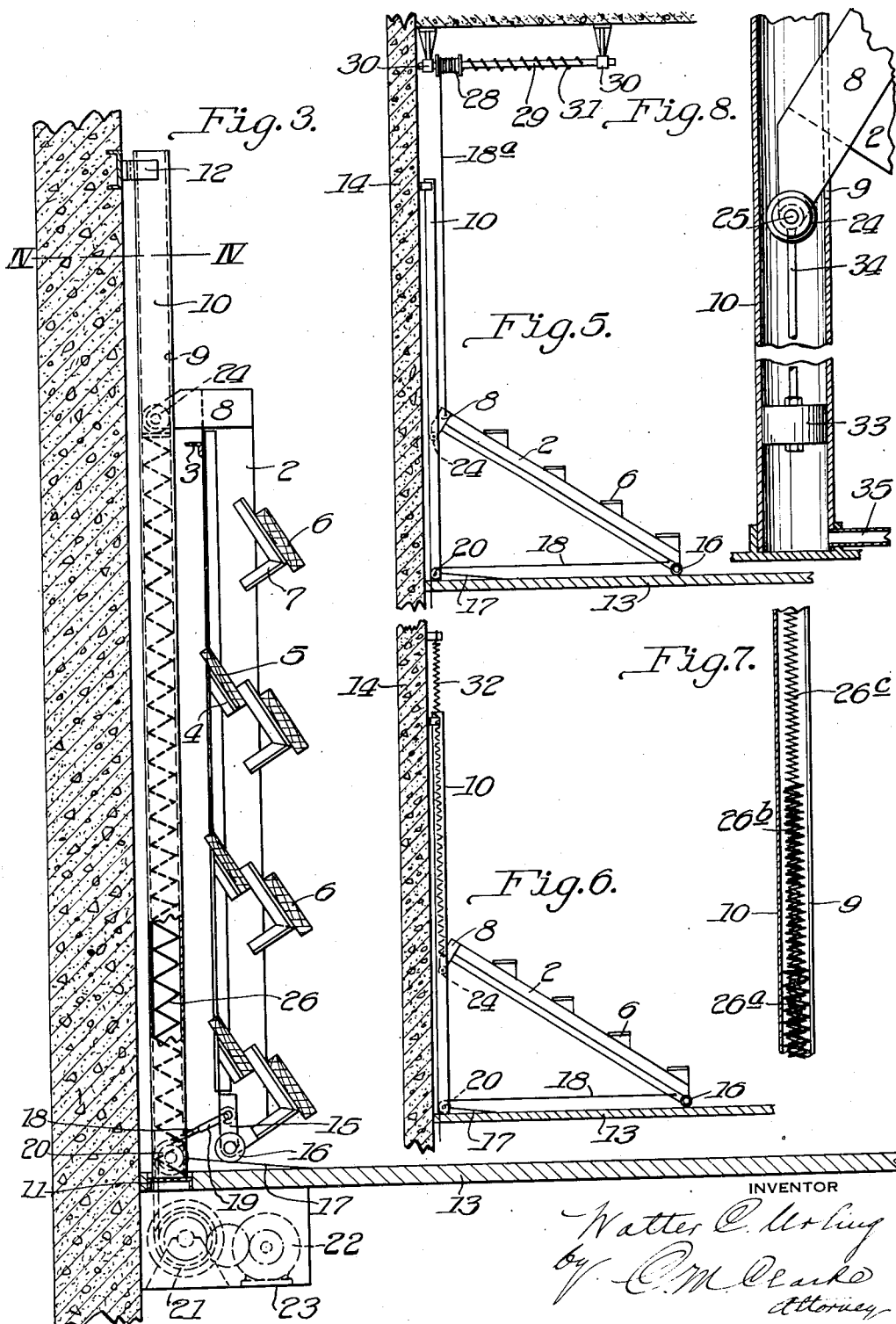
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ADJUSTABLE AUDIENCE SEAT

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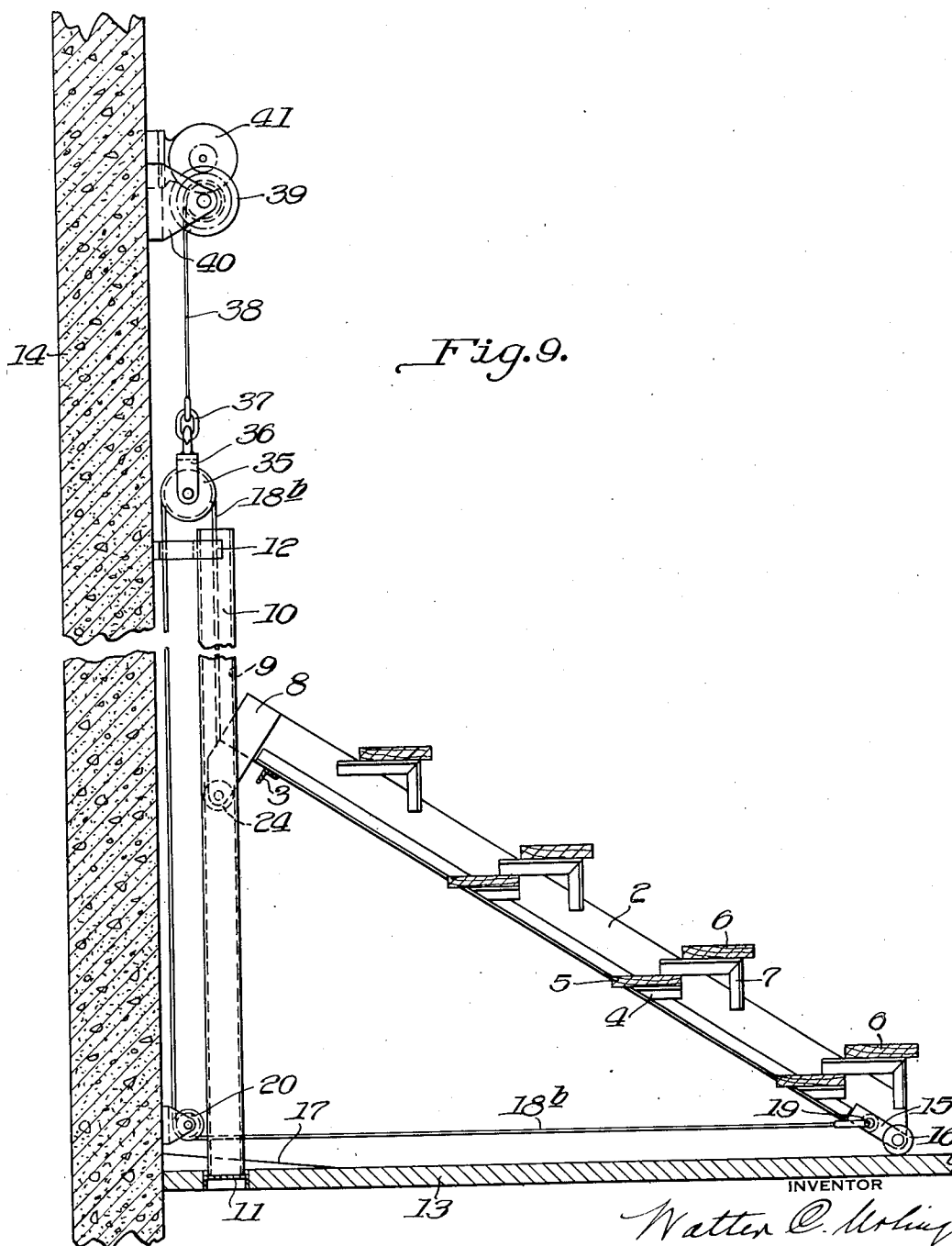
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ADJUSTABLE AUDIENCE SEAT

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

WALTER C. URLING, OF BADEN, PENNSYLVANIA

ADJUSTABLE AUDIENCE SEAT

Application filed January 21, 1930. Serial No. 422,309.

My invention refers to an improvement in the class of audience seats of the type known as "bleachers".

It has for its object to provide an adjustable seat frame adapted to be located in inclined operative position for use in front of a wall or boundary surface, and to be withdrawn backwardly for vertical storage, when not in use.

The improvement consists in a suitable framing having a series of transverse seat members, means for raising the same and lowering by gravity, including spring mechanism for cushioning and various other features of construction and operation, as hereinafter more fully described.

Referring to the drawings showing certain preferred constructions:

Fig. 1 is a sectional view in elevation, showing the device in position for use;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a view like Fig. 1 showing the apparatus stored away when not in use;

Fig. 4 is a cross section enlarged on the line IV—IV of Fig. 3;

Figs. 5 and 6 are detail views showing modified constructions of elevating mechanism;

Fig. 7 is a further detail view showing a modified construction of cushioning springs;

Fig. 8 is a sectional detail view showing the use of fluid resistance cushioning mechanism;

Fig. 9 is a view similar to Fig. 1, showing a modified construction of elevating and lowering apparatus.

The framework for the seats is generally rectangular in form, composed of purlin-like members 2 of structural shape, as angles or T irons, connected by one or more similar cross members 3 and transverse seat supporting brackets 4, of any suitable construction. These support the foot board member 5 behind the seat member 6, which members are supported at intervals by the brackets 7. The foot board 5 may be omitted from the uppermost seat, and as many seats, with proper spacing, may be used as may be placed along the length of the structure.

The upper portion of the framing is pro-

vided with backwardly extending plates or brackets 8, extending through the continuous front slot 9 of the corresponding upright pipe sections 10. These pipes are of sufficient height to allow for the necessary range of movement of the frame in operation, and are secured by proper connections 11 and 12 to the floor 13 and back wall 14 respectively.

The lower or outer ends of frame members 2 are each provided with a roller bearing 15 having at its end rollers or castor wheels 16, for movement over the surface of floor 13. At its inner portion the floor slopes slightly upwardly as at 17 so that when the framework is released, it will descend by gravity, assisted by the preliminary action of the rollers down such incline.

For the purpose of erecting the frame for collapsed position, as in Fig. 3, any suitable means may be utilized.

In the principal figures I show a cable 18 connected by clevis 19 to the roller bearing 15, passing over a sheave wheel 20, preferably mounted for slight lateral play on its shaft, and connected to the winding drum 21. Such drum is rotated in either direction by gearing and an actuating motor 22, all of which may be suitably housed in a depressed casing 23 below the floor, or otherwise as preferred.

The bracket 8 is provided at its inner end with bearing rollers 24, chamfered to fit against the interior wall of the pipe 10, and mounted on a cross shaft 25, as in Fig. 4. In the lower portion of pipe 10 is a cushioning spring 26 of the coiled type, of proper resistance to engage and oppose the impact of the rollers and the weight of the frame, when lowered, as in Fig. 1. The spring 26 also assists in initial raising of the frame, up to the extreme distention of the spring, as in Fig. 3, thereby greatly assisting the pull of the cable when first applied.

In Fig. 1 I show a gallery 27 illustrating further the convenience of the device for location underneath, as in gymnasium utilization.

Fig. 5 shows a further modification of lifting apparatus, consisting of a lifting cable

18a connected to the frame and wound on a winding drum 28 rotatably mounted on shaft 29 carried in bearings 30, and subject to the winding action of a torsional spring 31. By such arrangement the gravitating action of the frame, when drawn forwardly, will increase in proportion to the counteracting effect of the spring, while the lifting effect of the spring will be sufficient to firmly hold the frame, when back against the wall vertically. Any suitable holding or locking device may be utilized in addition, for safety, if desired.

In Fig. 6 I show a further modified construction utilizing a straight coiled spring 32, connected at its upper end to the ceiling or elsewhere and extending down through the pipe and connected to the bracket 8. Such spring will act generally in the same manner, it being understood that in either case several springs are to be used, as may be required.

In place of the single cushioning spring 26 I may also utilize a nested series of successively smaller diameter and longer springs, such as 26a, 26b and 26c, as in Fig. 7, each resting at the bottom of the pipe.

By such means the longest small diameter spring 26c will receive the first impact, initially supporting the weight until it is depressed to the top of spring 26b, both springs being then depressed together, with final impact against spring 26a.

By such arrangement, the spring resistance will steadily increase in proportion to the increasing gravitating pressure of the frame, as it lowers from the vertical towards its final inclined position.

Either pneumatic or hydraulic resistance may also be utilized for cushioning and absorbing the shock in lowering the frame, as indicated in Fig. 8.

In such case a plunger 33 may be connected with the bracket 8, as by bolt 34, and adapted to fit slidably within pipe 10 and to move upwardly and downwardly therein, with the bracket 8.

The bolt 34 is sufficiently long so that in lowering from the uppermost position there will be no leakage through slot 9, and with sufficient compression of air to effect an increasing degree of resistance, until the plunger has been lowered to the bottom of its stroke. The plunger will make close fitting and sealing engagement within the pipe, with resulting compression and cushioning resistance and retardation of movement.

Pipe 10 may be entirely closed at its lower end or may be connected, as by conduit 35, with a balancing plunger chamber, of familiar construction and function, for similar use with a liquid.

With either construction the lowering load will be cushioned with alternating assistance

in elevating the frame, as described in connection with the springs.

In Fig. 9 I show a construction in which a common lifting and lowering cable 18b connected by its ends with the bearing 15 and the upper bracket 8 passes over a lifting and lowering sheave or pulley wheel 35. The lower portion of the cable 18b passes around a corner sheave 20 as heretofore described, and the sheave 35 is connected by a clevis or bracket 36 and link mechanism 37 with a main raising and lowering cable 38. The latter is wound and unwound upon and from a drum 39 carried in bracket 40 on the wall and is rotated in either direction through suitable gearing from a reversible motor 41.

By such arrangement an equalized or balancing pull may be applied to both ends of the seat frame at any position to elevate, while in lowering the tension of the cable will ensure gradual and easy approach to the operative position, without shock or jar.

The construction and operation of the invention will be readily understood and appreciated from the foregoing description.

The bleacher seats when lowered are at the desirable position for use, restrained from any outward or lowering movement by the cable 18 and spring 26. Likewise, when not in operation, the entire floor space, except only the narrow portion occupied by the projecting thickness of the frame, is available for use.

It will be understood that the sealing framework may be made in sections of suitable length, for individual location and adjustment around the four walls of a room, or according to the space to be used.

Also that various changes may be made by the skilled mechanic in detail construction or otherwise, but that all such changes are to be considered as within the scope of the following claims.

I claim:

1. In combination with a floor surface having an inclined portion, an adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, and means attached to said lower supporting portion for moving the frame by such lower supporting portion over the floor surface and its inclined portion.

2. In combination with a floor surface having an inclined portion, an adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, and means engaging and adapted to move the lower portion of the frame inwardly from an extended towards a vertical position and across said inclined portion.

3. In combination with a floor surface having an inclined portion, an adjustable audience seat comprising a seat supporting frame

having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, means for vertically guiding the upper portion of the frame, and means attached to said lower supporting portion for moving the frame across the floor portion and its inclination.

4. An adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, means for moving the frame, and means for cushioning the frame on downward movement.

5. An adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, and raising and lowering means embodying cushioning means.

6. In combination with a floor surface having an inclined portion, an adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion provided with rolling bearings, an upper guiding portion, and means attached to said lower supporting portion for moving the frame and its bearings over the inclined floor portion.

7. In combination with vertical tubular guiding members, a seat supporting frame having upper terminals vertically movable along the guiding members and lower supporting floor terminals, and means engaging said floor terminals for moving the frame inwardly and upwardly.

8. In combination with vertical guiding members, a seat supporting frame having upper terminals vertically movable along the guiding members and lower supporting floor terminals, and a power actuated cable connected with the floor terminals for moving the frame inwardly and upwardly.

9. In combination with vertical guiding members provided with cushioning devices, a seat supporting frame having upper terminals vertically movable along the guiding members and lower supporting floor terminals, and means engaging said lower terminals for moving the frame inwardly and upwardly.

10. An adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, guiding means for the upper portion, a cable connected with the lower and upper portions of the frame respectively, and a lifting sheave for the cable.

11. An adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, guiding means for the upper portion, a cable connected with the lower and upper portions of the frame respectively, a lifting sheave for

the cable engaging it intermediate its ends, and means for raising or lowering the lifting sheave.

12. An adjustable audience seat comprising a seat supporting frame having a lower inwardly and outwardly movable supporting portion and an upper guiding portion, guiding means for the upper portion, a cable connected with the lower and upper portions of the frame respectively, a lifting sheave for the cable engaging it intermediate its ends, a separate cable connected with the lifting sheave, a winding and unwinding drum therefor, and a motor geared with the winding and unwinding drum.

13. In combination with vertical guiding members and a floor surface having an inclined portion, a seat supporting frame having upper terminals vertically movable along the guiding members and lower supporting floor terminals, means connected with the floor terminals for moving them along the floor surface and onto the inclined portion thereof.

In testimony whereof I hereunto affix my signature.

WALTER C. URLING.