

(No Model.)

4 Sheets—Sheet 1.

G. ABEL.
VESTIBULE FOR CARS.

No. 515,510.

Patented Feb. 27, 1894.

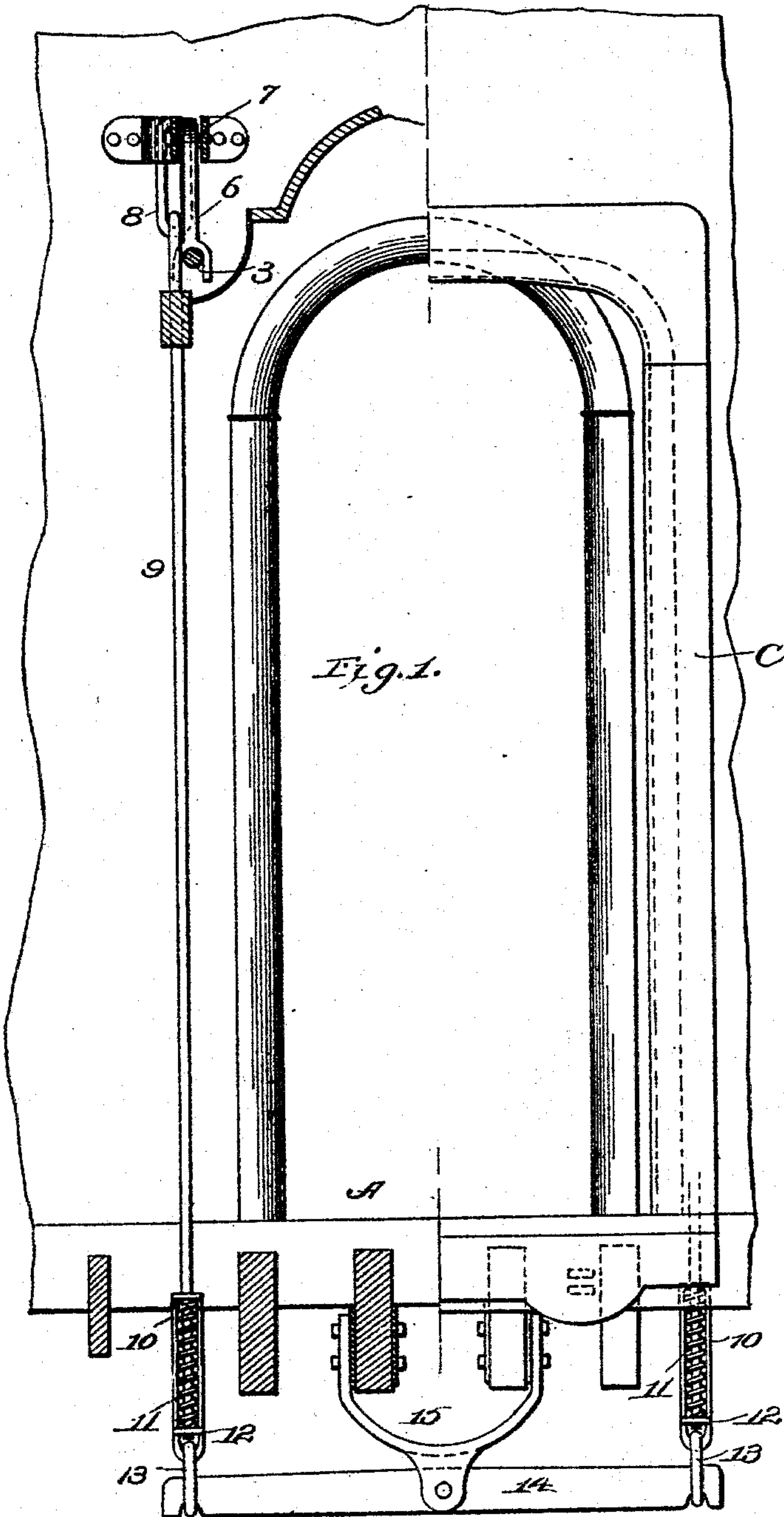
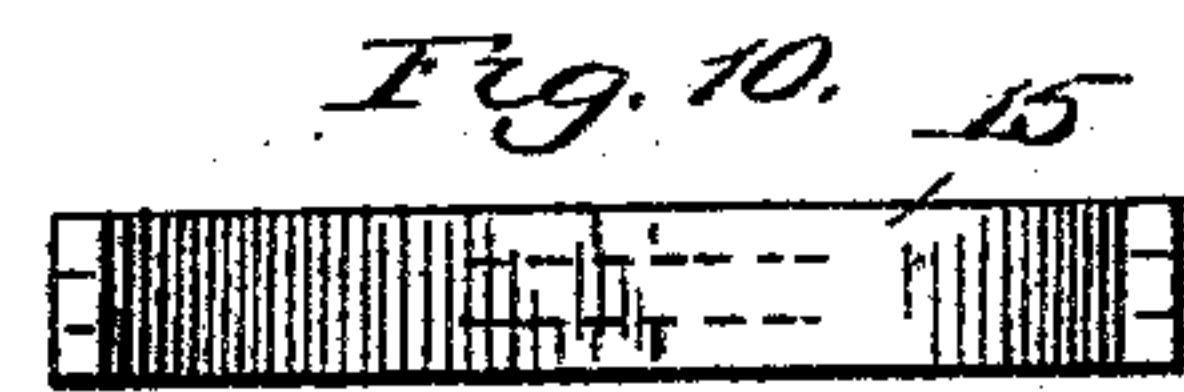
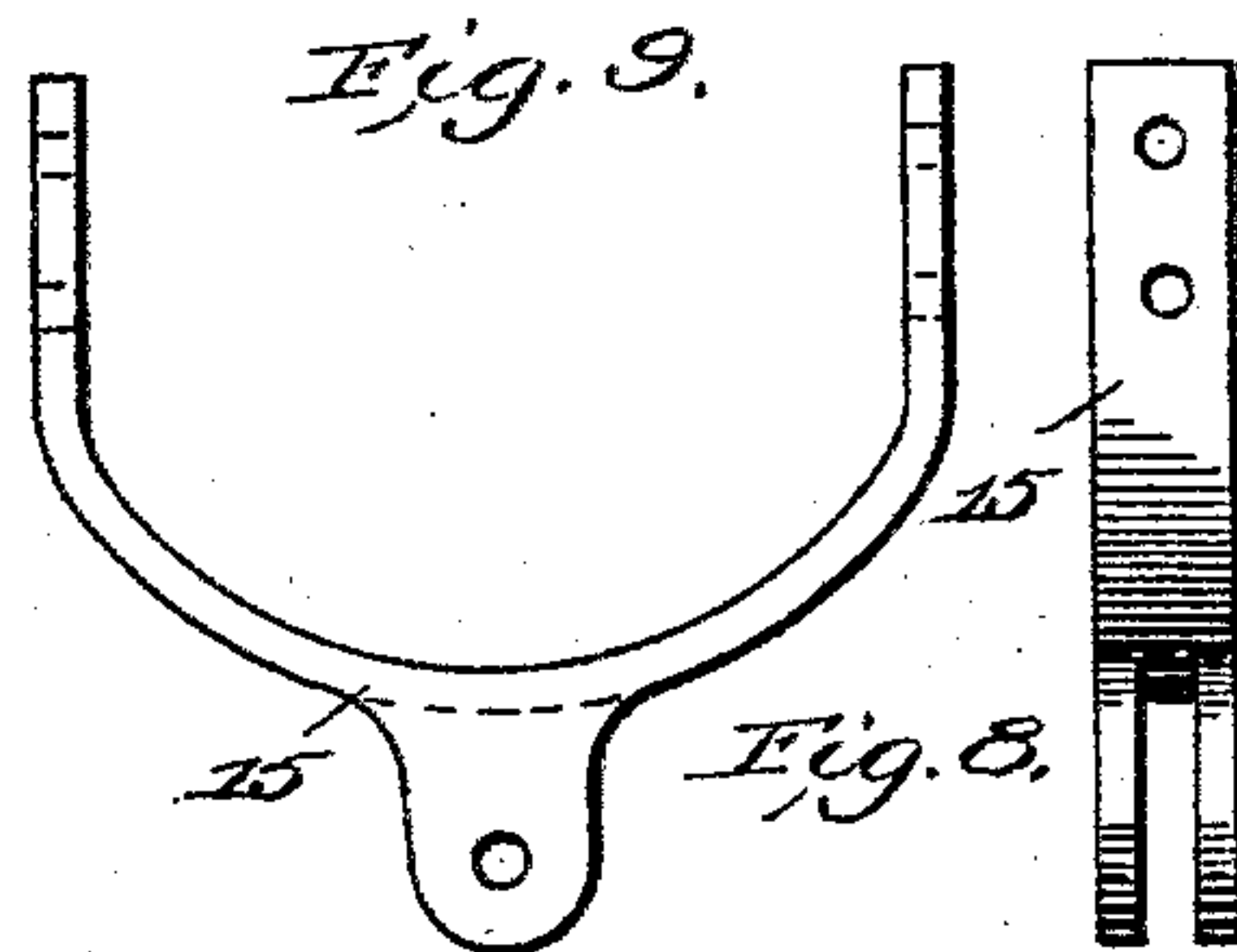
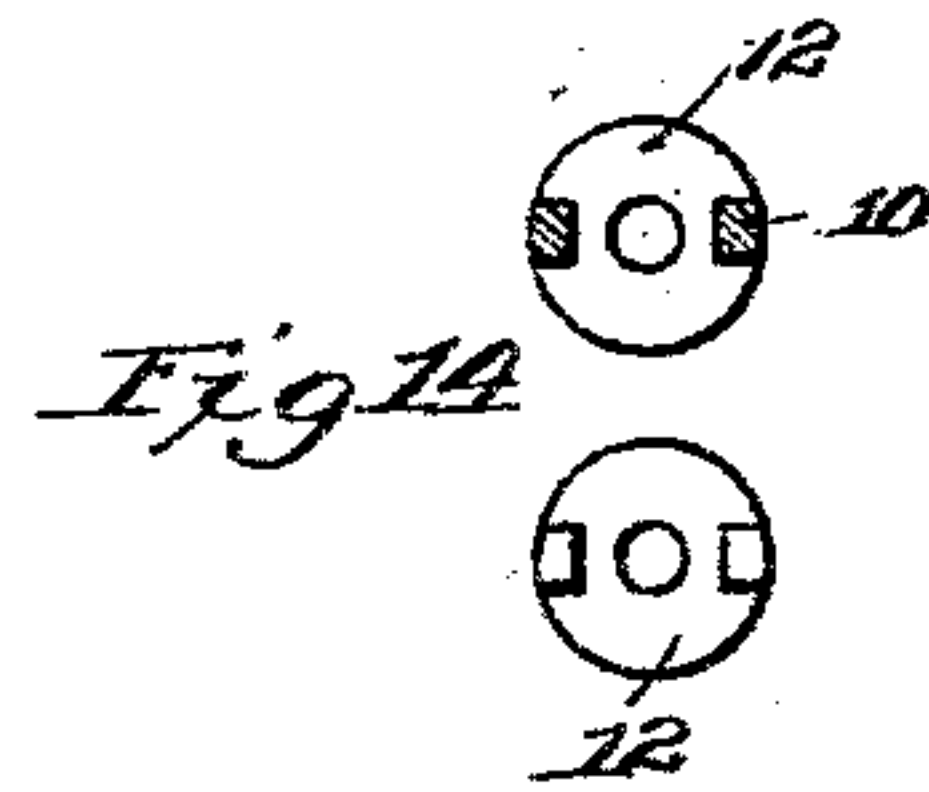
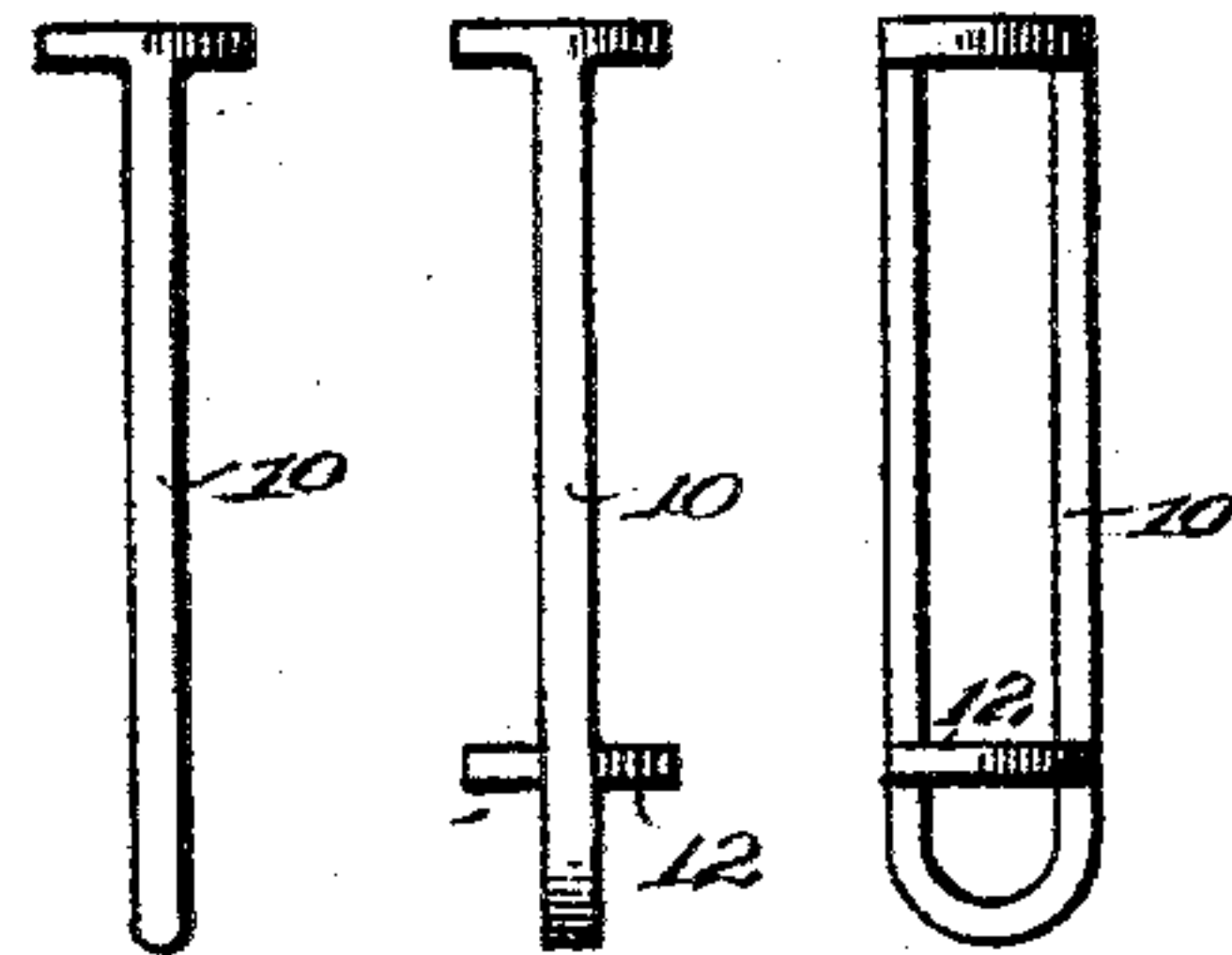


Fig. 11. Fig. 12. Fig. 13.



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Fig. 2.

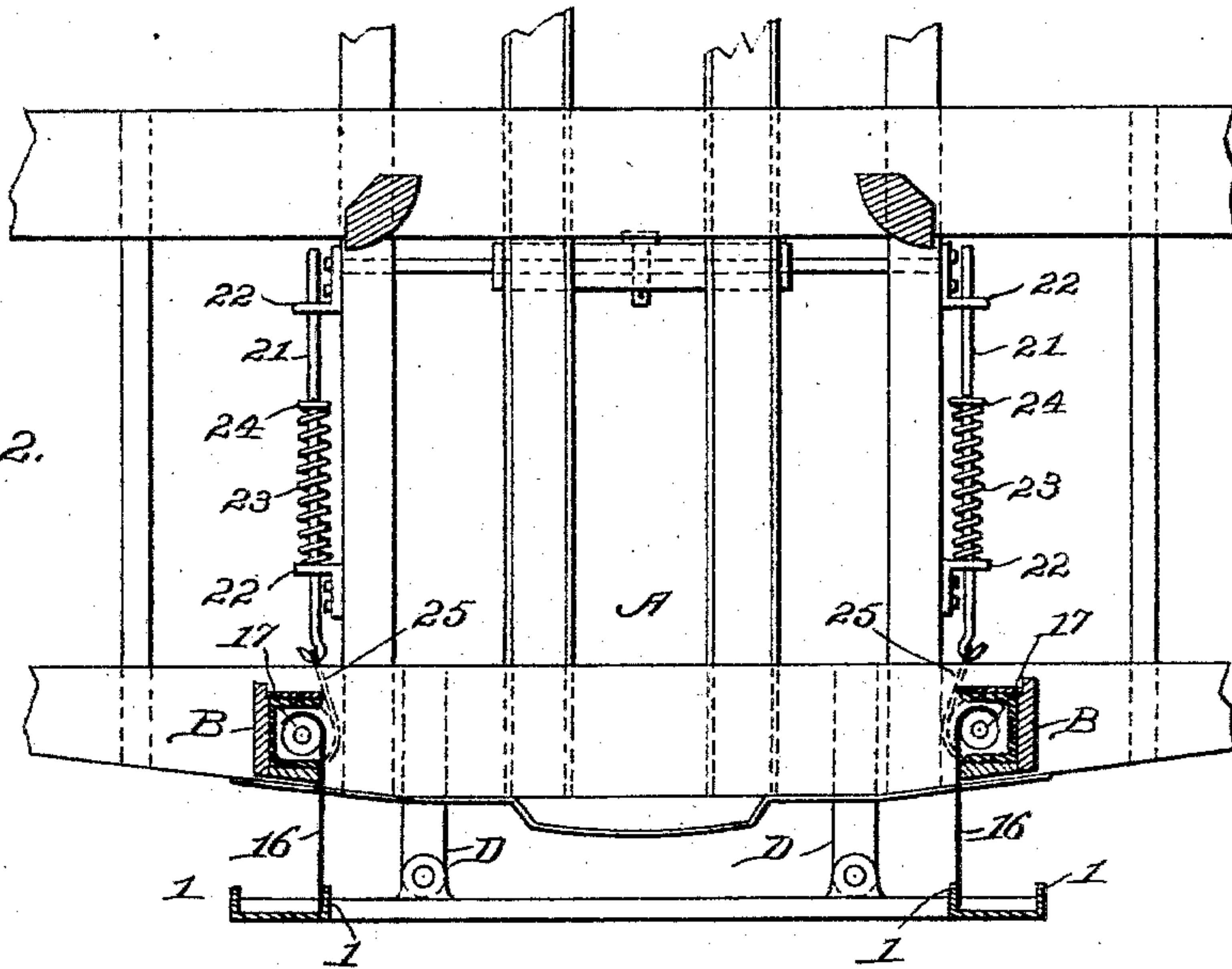


Fig. 3.

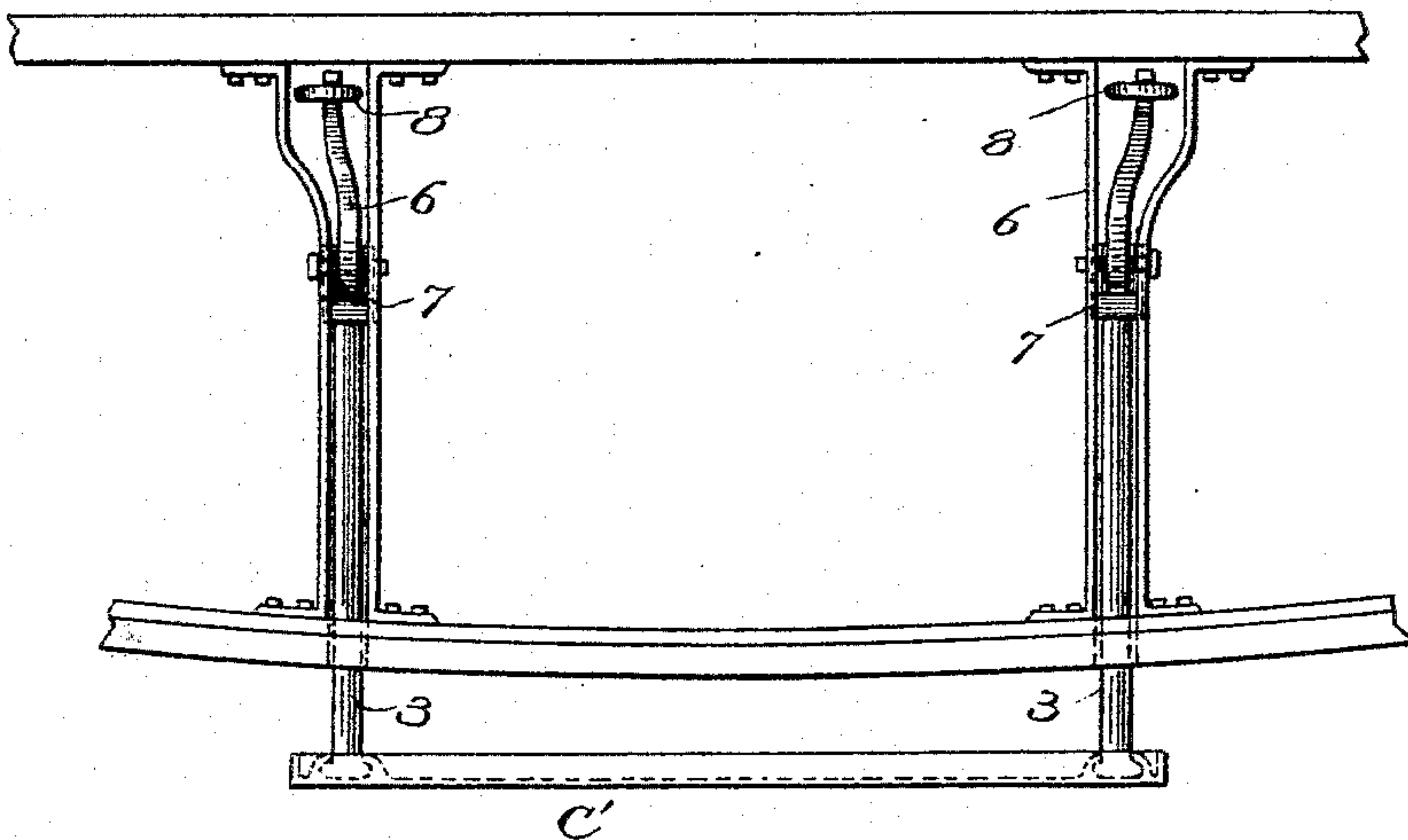
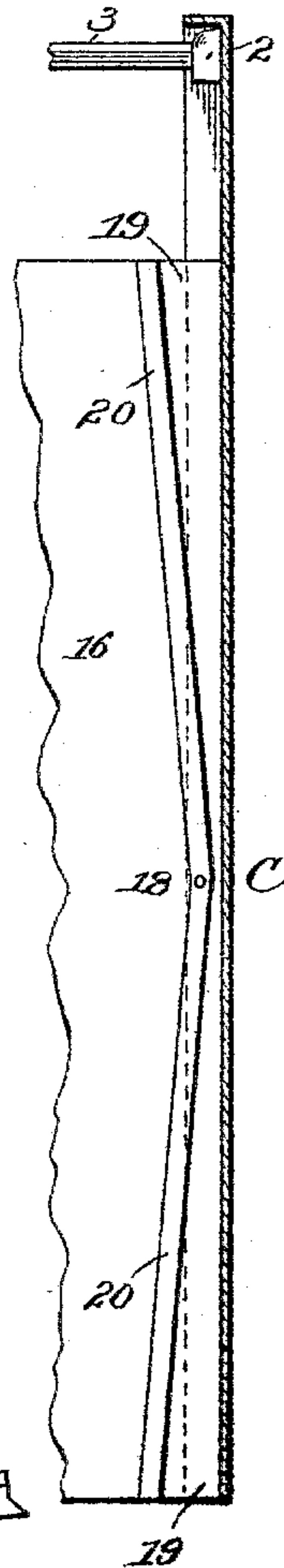


Fig. 15.



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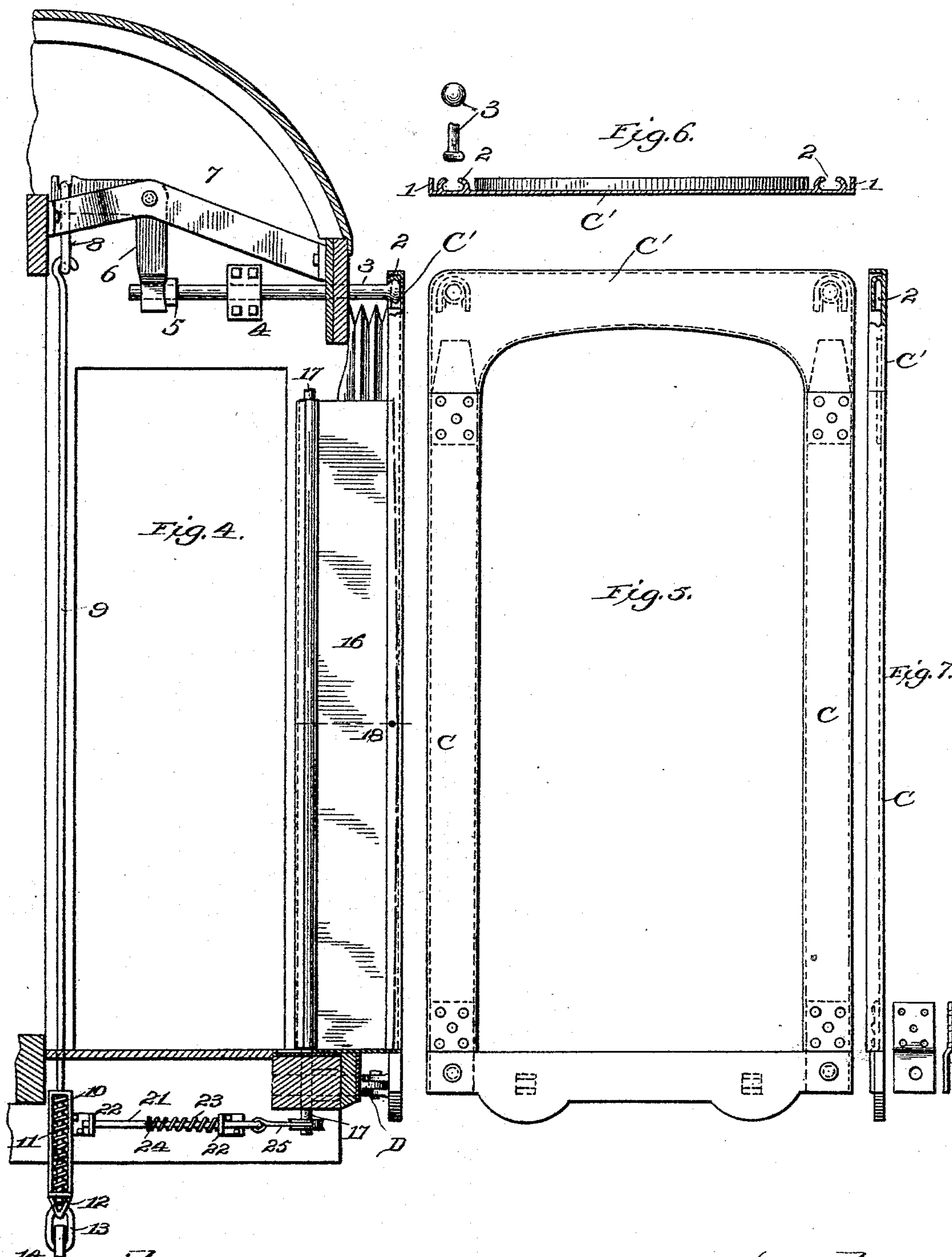
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4 Sheets—Sheet 3.

G. ABEL.
VESTIBULE FOR CARS.

No. 515,510.

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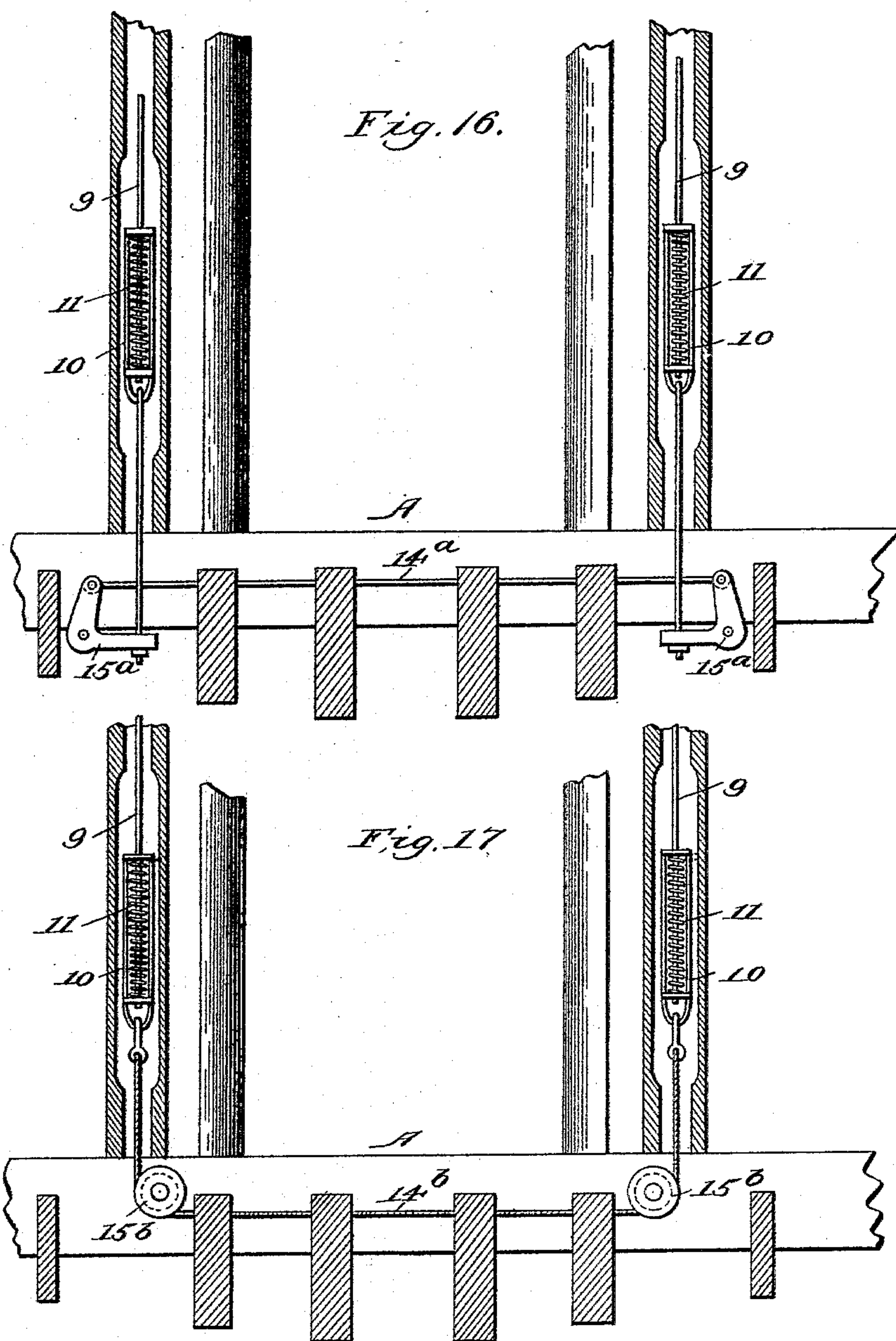
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4 Sheets—Sheet 4.

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No. 515,510.

Patented Feb. 27, 1894.



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UNITED STATES PATENT OFFICE.

GEORGE ABEL, OF CHICAGO, ILLINOIS.

VESTIBULE FOR CARS.

SPECIFICATION forming part of Letters Patent No. 515,510, dated February 27, 1894.

Application filed December 4, 1893. Serial No. 492,692. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ABEL, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have
5 invented certain new and useful Improvements in Vestibules for Railway-Cars; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in
10 which—

Figure 1 is a front view of a vestibule, the right hand portion of the figure showing the diaphragm plates in elevation; the left of the figure being in vertical transverse section to
15 show the rod or link connection between the equalizers and the stems which control the top or arch of the diaphragm. Fig. 2 is a horizontal section of the vestibule proper and the diaphragm plates, the flooring of the vestibule removed to show the mechanism for
20 controlling the tension of the flexible webs or curtains which connect the diaphragm plates with the vestibule proper. Fig. 3 is a horizontal section of the upper part of the vestibule showing the mechanism which supports
25 and controls the arch of the diaphragm plates and connects the same with the vestibule proper at the top of the car. Fig. 4 is a longitudinal vertical section of the vestibule proper, and the arch of the diaphragm plate,
30 and shows the flexible web or side curtain and also an accordion or plaited hood in section. Fig. 5 is a front elevation of the diaphragm plates, showing one manner of connecting the side plates and arch section, also
35 indicating the connection with the buffer stems. Figs. 6, 7, 8, 9, 10, 11, 12, 13 and 14, are details of construction. Fig. 15 is a detail view, showing the forward edge of the
40 flexible web cut back from its center or point of attachment to the diaphragm plate to prevent crimping or folding of the web when the diaphragm plate is out of a true vertical line. Figs. 16 and 17, are vertical transverse sectional views of a vestibule, showing modifica-
45 tions in the equalizing mechanism connecting the stem supports of the diaphragm plate.

Like symbols refer to like parts wherever they occur.

50 My invention relates to the construction of vestibules for passenger cars.

As is well understood, the general construc-

tion of vestibules for cars, embodies the combination with the covered platform or vestibule proper, of spring supported or yielding
55 diaphragm plates, a hood, and flexible side walls extending from the diaphragm plates to the posts of the vestibule proper—said hood and side walls being commonly of accordion or plaited material which will per-
60 mit of the to and fro as well as rocking movements of the diaphragm plates in rounding curves, &c.

The main objects of my invention are, first, to simplify the mechanism which controls the
65 diaphragm plates, and flexible connections between the same and the vestibule proper, reduce the number of working parts, render them easy of access for renewal or repair—and to effectually substitute for the easily
70 destructible and unsightly accordion extension web a flexible web so maintained under tension as to present at all times, a smooth unbroken surface on each side of the vestibule.
75

To this end, my invention generally stated embraces as its first feature, the combination with the diaphragm plates, of stems which support the plates above, and an interposed
80 elastic resilient bodily movable equalizing connection between said stems, whereby perfect contact and uniform pressure between adjacent plates is maintained in curving, &c.; and as its second feature, it embraces, the
85 combination with the diaphragm plates, and a web roller of a flexible web which forms the side wall, a spring, and a flexible connection between the spring and the web roller, whereby an extended movement of the flexible web
90 is obtained with practically uniform tension of the web.

There are other minor features of invention, growing out of and adjunctive to the main features, all as will hereinafter more
95 fully appear.

I will now proceed to describe my invention more fully so that others skilled in the art to which it appertains may apply the same.

In the drawings, A indicates the car platform upon which is erected the usual vestibule proper having the posts B, (see Fig. 2,) which in the present instance are preferably
100 hollow or box-shaped, for the reception of the rollers to which are attached the flexible webs

which extend to the diaphragm plates and form a continuation of the side walls of the vestibule. In all other respects the vestibule proper may be constructed in the usual, or
5 any approved manner.

C, indicates the diaphragm plates which I prefer to construct of channel-shape in cross section, or with rearwardly projecting flanges (as at 1—1 Figs. 2 and 6) and said diaphragm
10 plates are connected at the bottom with the usual buffer stems D D, in any preferred manner.

The arched upper portion C' of the diaphragm plate—which is secured to the vertical sections of the diaphragm plate by overlapping flanges, or in any other suitable manner—is provided on its rear face with slotted receptacles 2 2, (see Figs. 5 and 6,) for the
15 elliptical enlarged heads of stems 3, 3,—one for each side—which stems support and control the top of the diaphragm plate—the bottom thereof being controlled by the buffer stems D D, as hereinbefore pointed out. Each of said stems 3, 3, passes back through
20 the front of the vestibule proper on one side thereof (see Figs. 3 and 4) through a bracket or guide 4 on the side wall, and by means of an adjustable nut 5, or its equivalent, engages the forked arm of a rock lever 6, said
25 rock lever having its fulcrum on a bar 7 bolted to the frame work of the car. The other, or rear, arm of such rock lever 6, is notched to receive a link 8 into the lower end of which is hooked a vertical rod 9, which passes down
30 through a yoke or spring pocket 10, and spring 11 and is provided at its lower end with a collar 12 adapted to slide within the yoke or spring pocket 10, and compress spring 11. The opposite yokes 10—10— or the spring
35 pockets on opposite sides of the vestibule are connected by links 13, or in other suitable manner with an equalizer, which may be in the form of a lever or equalizing bar 14 having its fulcrum 15 bolted to the under
40 side of the platform (see Fig. 1);—or rocker arms 15^a connected with the spring pockets or yokes 10, and with each other by the equalizing bar 14^a (see Fig. 16)—or, in even simpler forms, viz: a flexible connection 14^b which
45 passes around sheaves 15^b, is secured at its ends to the opposite yokes, or spring pockets 10 (see Fig. 17)—or, in fact any equivalent means which will so connect the spring yokes
50 or pockets that the springs shall be equally compressed in curving and thus maintain equal or uniform pressure on both sides of the diaphragm plates, and as a consequence perfect and equal contact between the diaphragm plates of adjacent vestibules through-
55 out.

16, 16 (see Figs. 2 and 4) indicate the webs of flexible material which form the extended side walls of the vestibule between the posts B, B, and the vertical diaphragm plates C.
60 Each of these webs 16, is secured by one edge to a vertical web roller 17 set in its respective box post B, the opposite edge of the web be-

ing cut back or inclined from the center point 18, (see Figs. 4 and 15,) where it is secured to the diaphragm plate C. This construction and connection of the web and diaphragm plate will cause the strains between the webs and diaphragm plates to operate longitudinally central of the webs and thus prevent any folding or wrinkling of the webs
75 which might arise from any departure of the diaphragm plates from a true vertical position. The triangular spaces above and below the point 18 formed by cutting back the edge of the web 16 may be closed by elastic
80 bands or gores 19, (see Fig. 15) if desired the leading edge of the web 16 may be provided with a light metal plate—or metal binding—as indicated at 20.

21—21 (see Figs. 2 and 4) indicate sliding
85 rods arranged in suitable guides or brackets 22—22, beneath the vestibule floor, each of said rods being encircled by a spiral spring 23, confined between the forward bracket and a collar 24 on the rod, and each rod being
90 connected at its forward end to its respective web roller 17, by a chain cord, or flexible connection 25, adapted to coil on the extended shaft of the roller. This construction, or its equivalent, will permit of a practically un-
95 limited extension or retraction of the web 16, and maintain it under substantially uniform tension.

The devices being constructed and combined with the vestibule proper and the diaphragm plate substantially as hereinbefore specified, will operate as follows: In curving, when the distance decreases between the platforms on one side and increases on the other, the diaphragm plates will, of course, be
100 forced toward the cars on the inner side of the curve which will compress the inner buffer springs and force in the inner stems 3, at the top of the adjacent diaphragms. The stems 3 act on the forked rock arm 6, raising rod 9
105 and compressing the spring 11 of that side, but at the same time, as the spring pocket or yoke 10 is a traveling yoke so that the whole spring is capable of longitudinal or bodily movement the force is transmitted through
110 spring pocket or yoke 10 of said side and the equalizing connection (14—14^a or 14^b, as the case may be) to the opposite spring pocket or yoke 10, its spring and rod 9 to the opposite
115 rock arm 6 and stem 3, so that there is equal spring pressure throughout the system and on all parts of the diaphragm plates co-existent with extended movement of said plates. At the same time the spring tension rods 21
120 will the one advance and the other recede so as to maintain the proper tension on the flexible webs 16—16 through the medium of the chains or cords 25—25, which in coiling on or
125 uncoiling from the shafts of web rollers 17—17, permit a practically unlimited extension or reduction of the web walls while maintaining them with a smooth or unwrinkled surface.

It will be noted that in the construction of the devices chosen for purposes of illustrat-

ing my invention, the simplest combination of co-acting elements embraces the diaphragm plate, stems passing through the front of the vestibule proper and acting on two rocker arms which rocker arms are either mediately or immediately connected by an interposed spring capable of longitudinal movement bodily or independent of its spring action.

I am aware that there have heretofore been combined in an equalizer for car vestibules:—first, a horizontal or transverse centrally pivoted lever;—second, two vertical pivoted levers, each having its lower end forked or bifurcated, and its upper end connected to one end of the transverse lever by a link or links;—third, two horizontal stems or shafts connected with the diaphragm-plate above and at opposite sides and each provided with a fixed collar and a loose or movable collar, the shaft passing through the fork of the vertical pivoted lever and the movable collar adapted to engage the said lever—and fourth, two spiral springs equal to the requirements for upper buffers, one of said springs arranged on each horizontal stem or shaft between the fixed and the movable collar thereof: but such a construction or combination differs from that hereinbefore set forth by me, in that one of the springs (both of which are essential to the recited combination) must have a fixed support, which in conjunction with the fixed collar upon its shaft and the movable collar between the spring and vertical pivoted lever, limits the equalizing movement of the system to the limit of compression of the springs, whereas in my system the spring is a bodily movable or floating spring, the movements of which are practically unrestricted.

Having thus described the nature, operation, and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a vestibule proper, and a diaphragm plate, of an equalizer, a spring or springs connected thereto, and movable therewith, and stems which support the diaphragm plate, and positively actuate the equalizing mechanism; substantially as and for the purposes specified.

2. The combination with a vestibule and diaphragm plate, of stems which are connected with the top of the diaphragm plate, springs connected with the respective stems, spring pockets or yokes, and an equalizer which connects the spring yokes; substantially as and for the purposes specified.

3. The combination with a vestibule and diaphragm plate, of stems connected with the top of the diaphragm plate, rocker arms with which the stems engage, an equalizer, and a spring interposed between the equalizer and each of the rocker arms; substantially as and for the purposes specified.

4. The combination with a vestibule and diaphragm plate, of stems connected with the top of the diaphragm plate, rocker arms with

which the stems engage, rods secured to the rocker arms, an equalizer, and a spring interposed between the equalizer and each of the said rods, substantially as and for the purposes specified.

5. The combination with a vestibule and diaphragm plates, of stems connected with the top of the diaphragm plates, rocker arms, with which the stems engage, rods connected with the rocker arms, a spring yoke and spring for each of said rods, and an equalizer which connects the spring yokes; substantially as and for the purposes specified.

6. The combination with a vestibule and diaphragm plate, of horizontal stems for the top of the diaphragm plate, rocker arms, vertical rods, an equalizer, and interposed springs; substantially as and for the purposes specified.

7. The combination with a vestibule and diaphragm plates, of a flexible web cut back at one edge and having a central connection at said edge, and means for retracting the web at the opposite edge; substantially as and for the purposes specified.

8. The combination with a vestibule and diaphragm plate, of a flexible web cut back at its front edge and having a central connection with the diaphragm plate, and a spring actuated roller for controlling the other edge of the flexible web; substantially as and for the purposes specified.

9. The combination with a vestibule and diaphragm plates, of a flexible web cut back at its edge and having a central connection with one of said first named parts, elastic gores secured to the cut back edge, and means for retracting the opposite edge of the flexible web; substantially as and for the purposes specified.

10. The combination with a vestibule and diaphragm plates, of a flexible web, a roller therefor, a spring for actuating the roller, and a cord or like flexible connection between the spring and roller; substantially as and for the purposes specified.

11. The combination with a vestibule and diaphragm plate, of a flexible web, a roller therefor, a spring actuated rod, and a flexible connection between the rod and web roller; substantially as and for the purposes specified.

12. The combination with a vestibule proper and diaphragm plate, of stems which support the diaphragm plate, rocker arms with which the stems engage, and a bodily movable spring equalizing mechanism interposed between the rocker arms; substantially as and for the purposes specified.

13. The combination with a vestibule proper and a diaphragm plate, of rocker arms, an equalizer, and vertical spring connections between the rocker arms, and the equalizer; substantially as and for the purposes specified.

14. The combination with a vestibule proper and a movable diaphragm plate, of means for supporting said movable diaphragm plate a bodily movable equalizing mechanism inter-

posed between the movable diaphragm-plate supports, said equalizing mechanism having as a constituent part a resilient element distant from the movable diaphragm supports, 5 and means for actuating said equalizing mechanism as a whole from the diaphragm plate; substantially as and for the purposes specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 1st day of December, 1893. 10

GEORGE ABEL.

Witnesses:

M. L. ALLEN,
R. E. JANNEY.