

No. 685,303.

Patented Oct. 29, 1901.

H. SIEGMANN.

MEANS FOR AUTOMATIC OPERATION OF BARRIERS IN RAILROAD CROSSINGS.

(Application filed Jan. 18, 1901.)

(No Model.)

4 Sheets—Sheet 1.

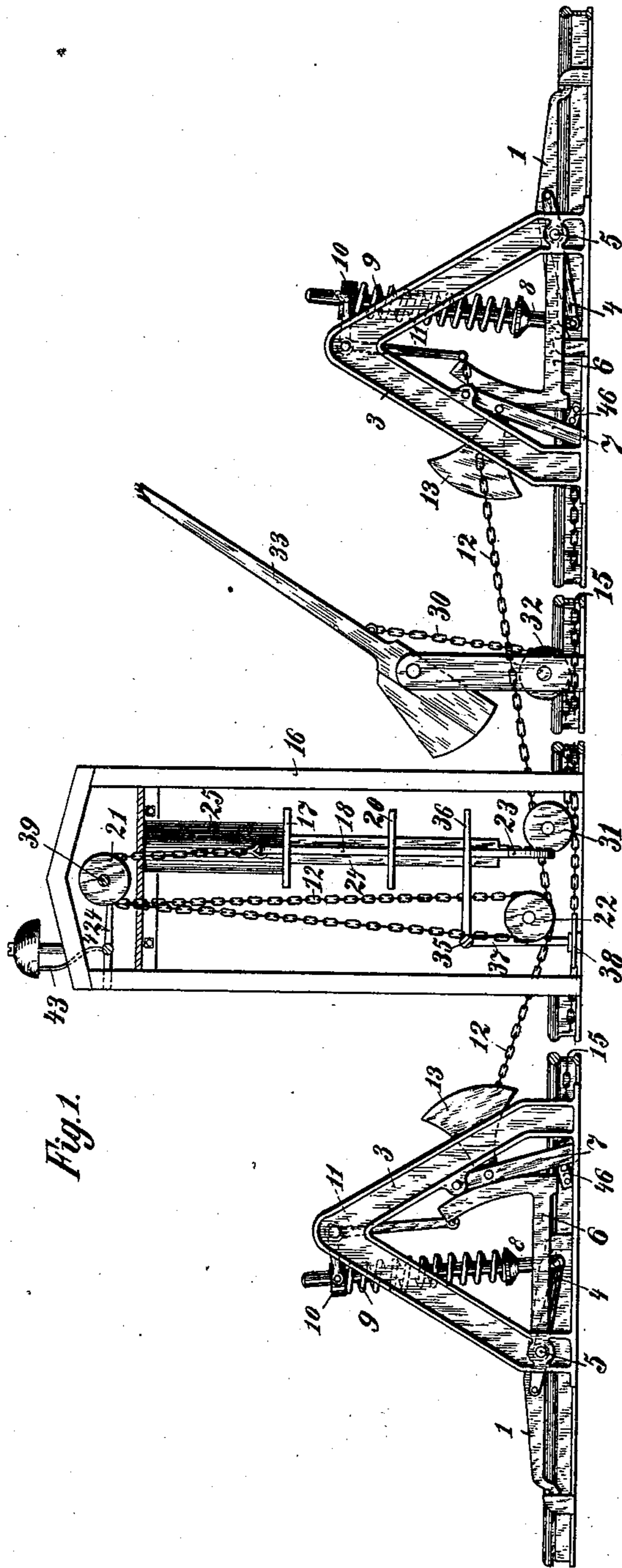


Fig. 1.

Witnesses

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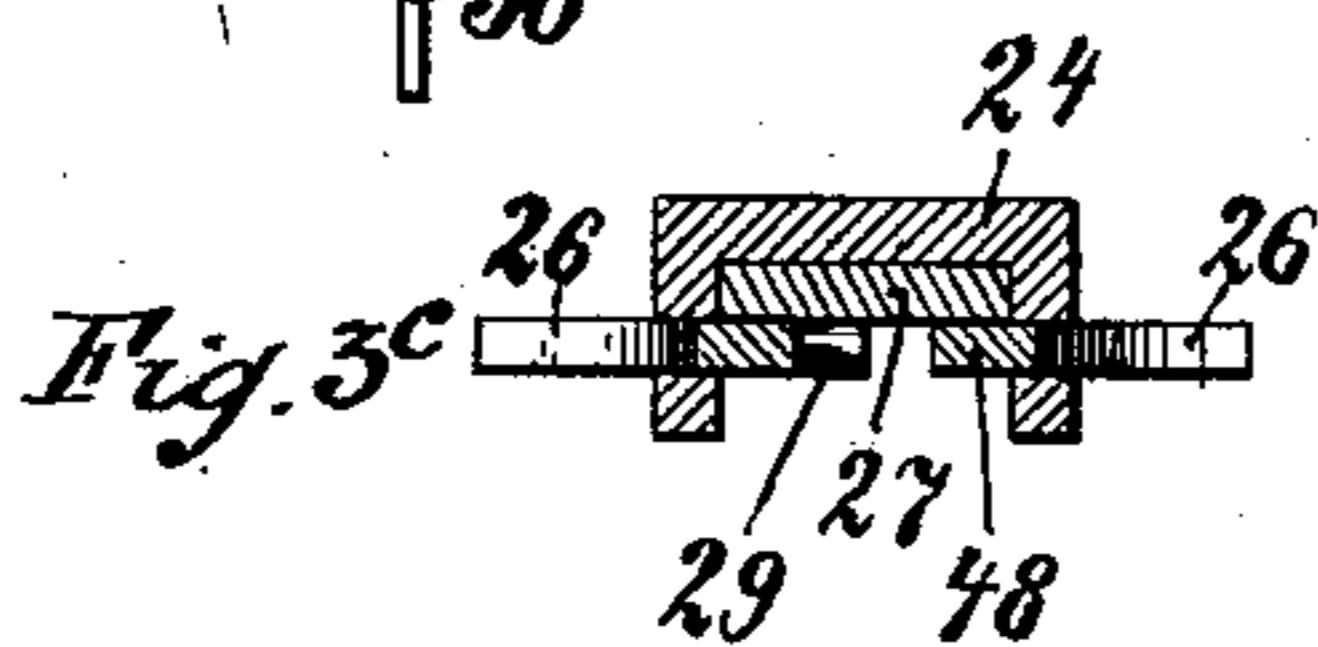
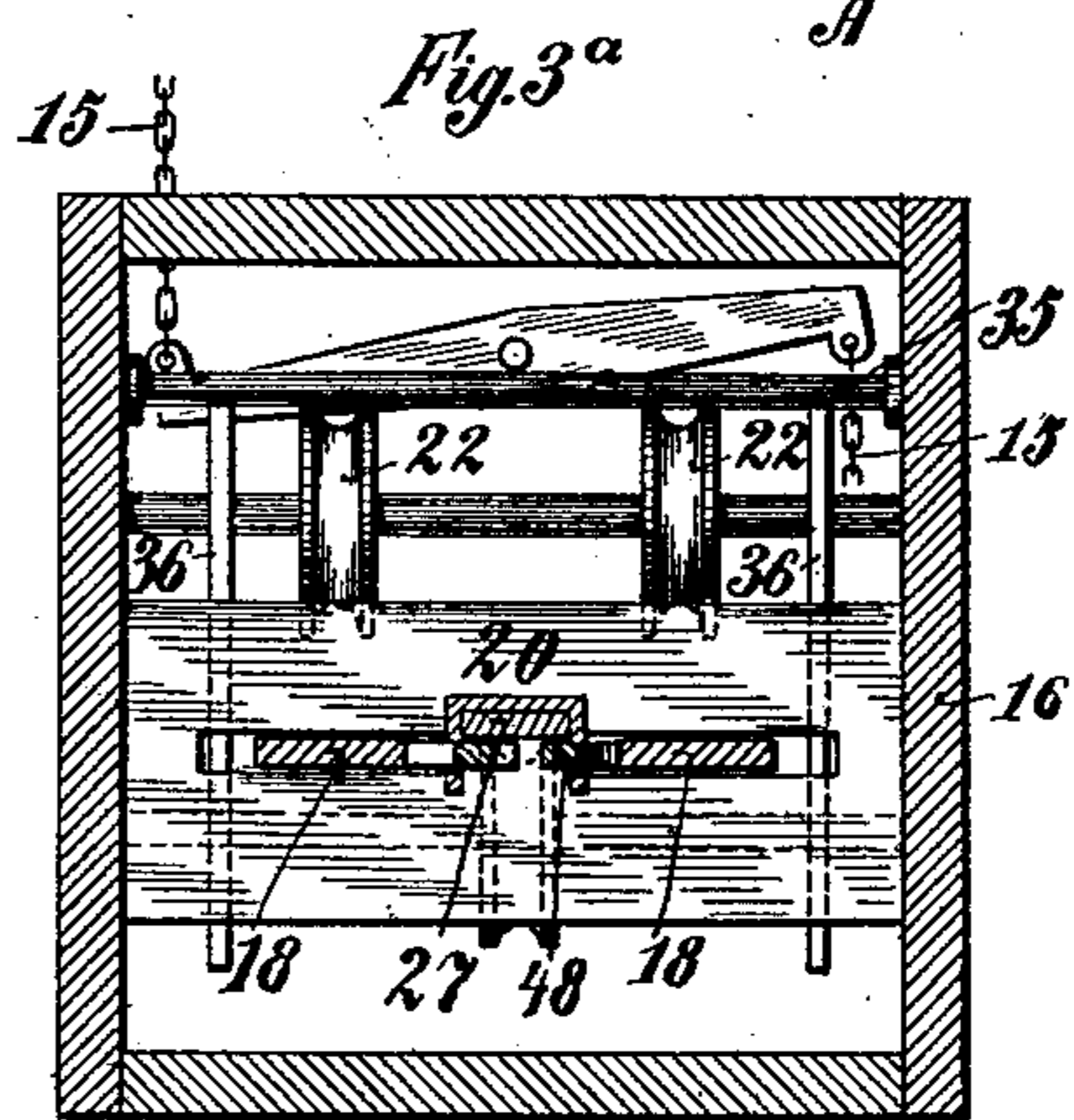
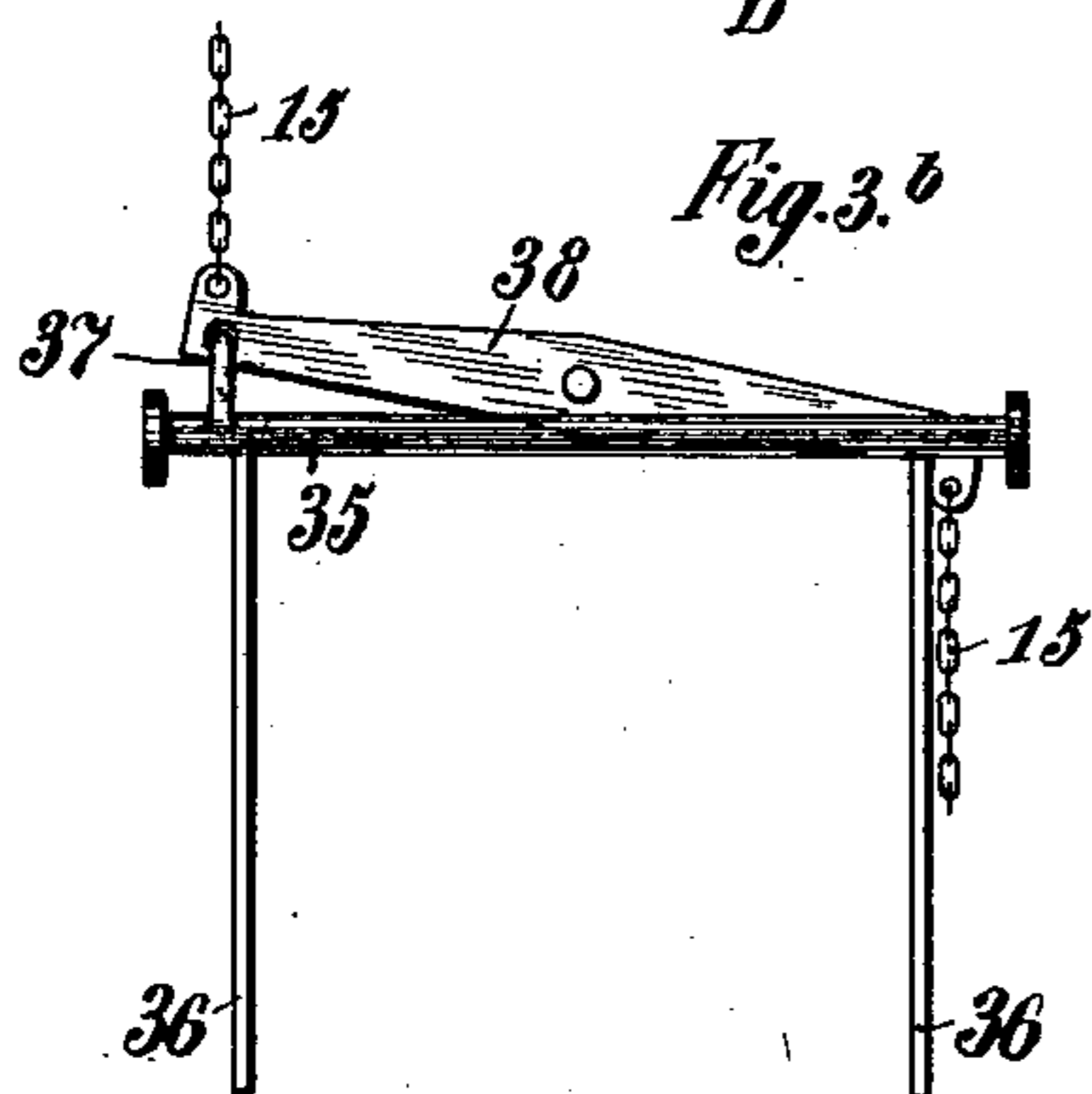
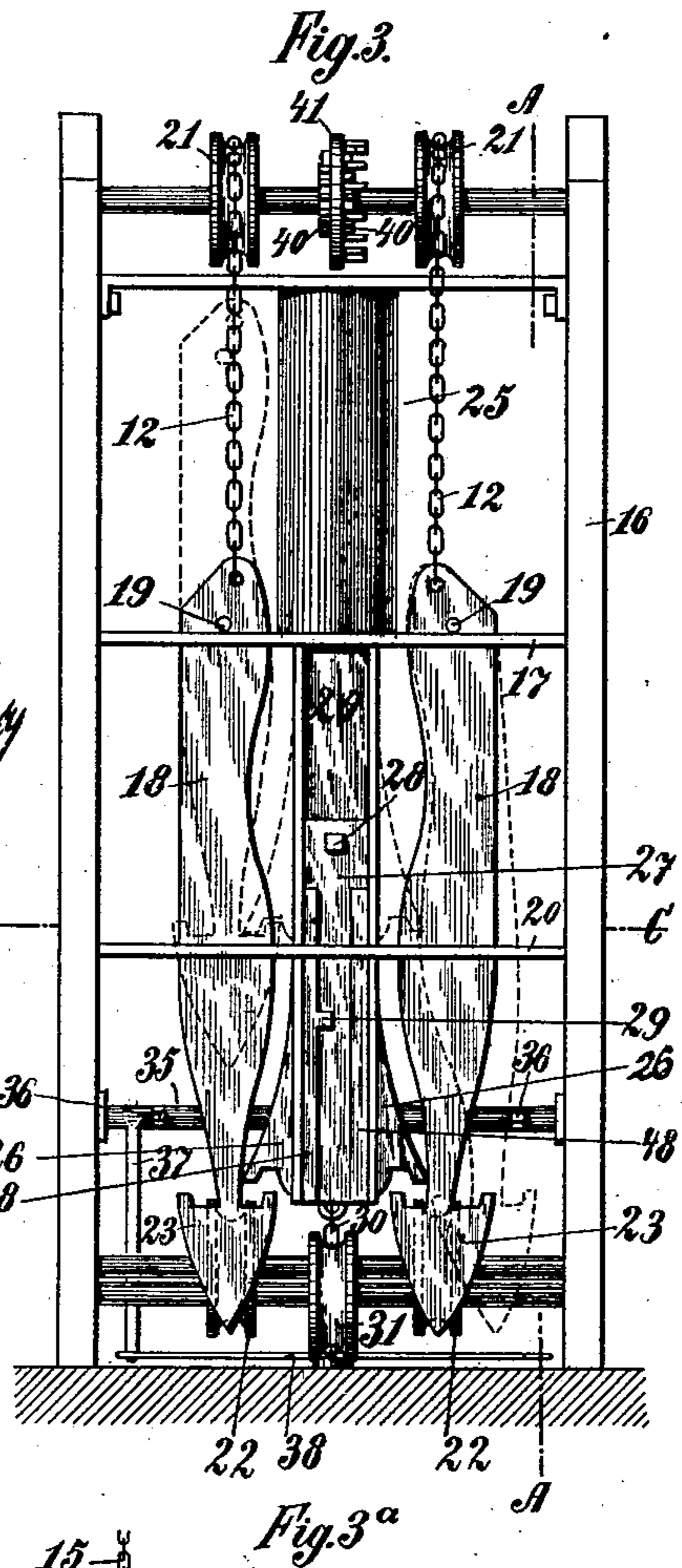
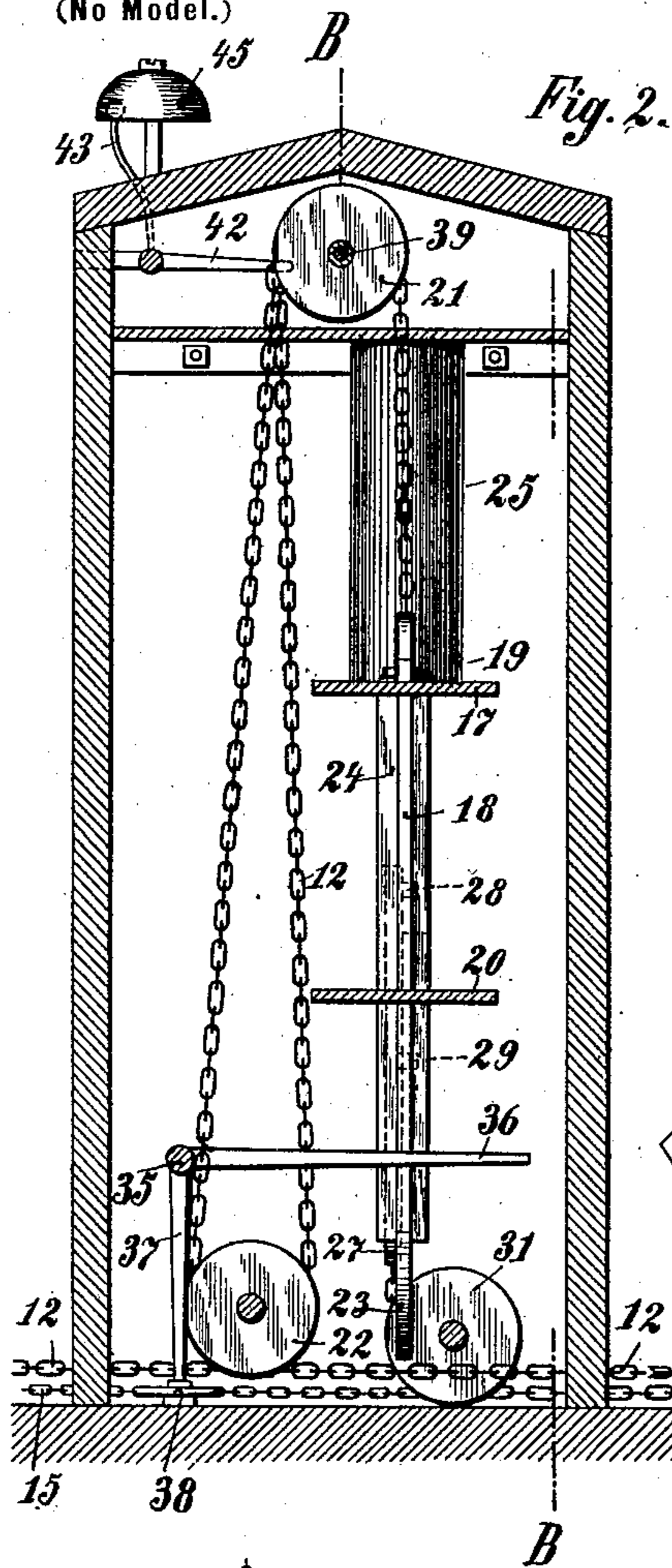
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4 Sheets—Sheet 2.



Witnesses

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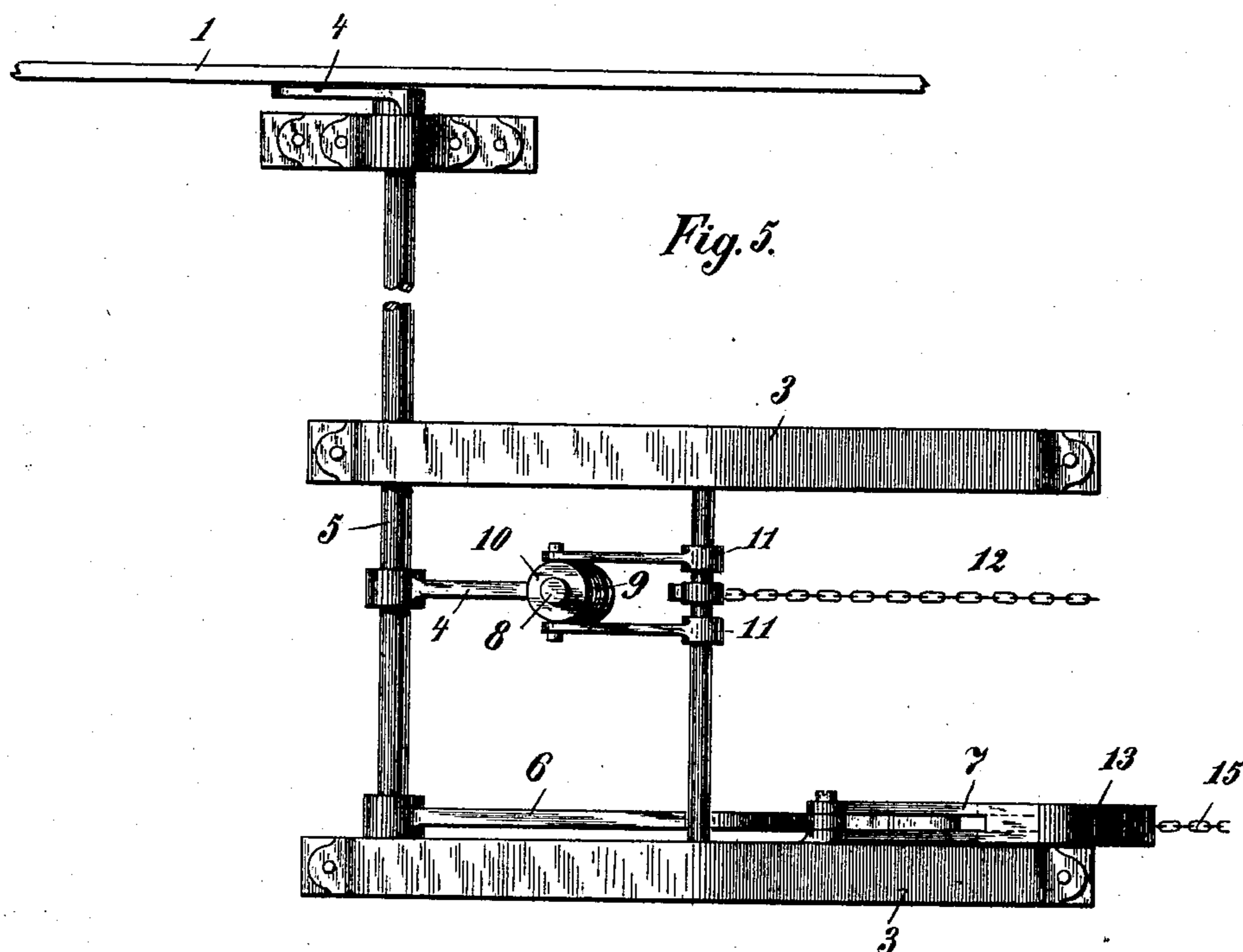
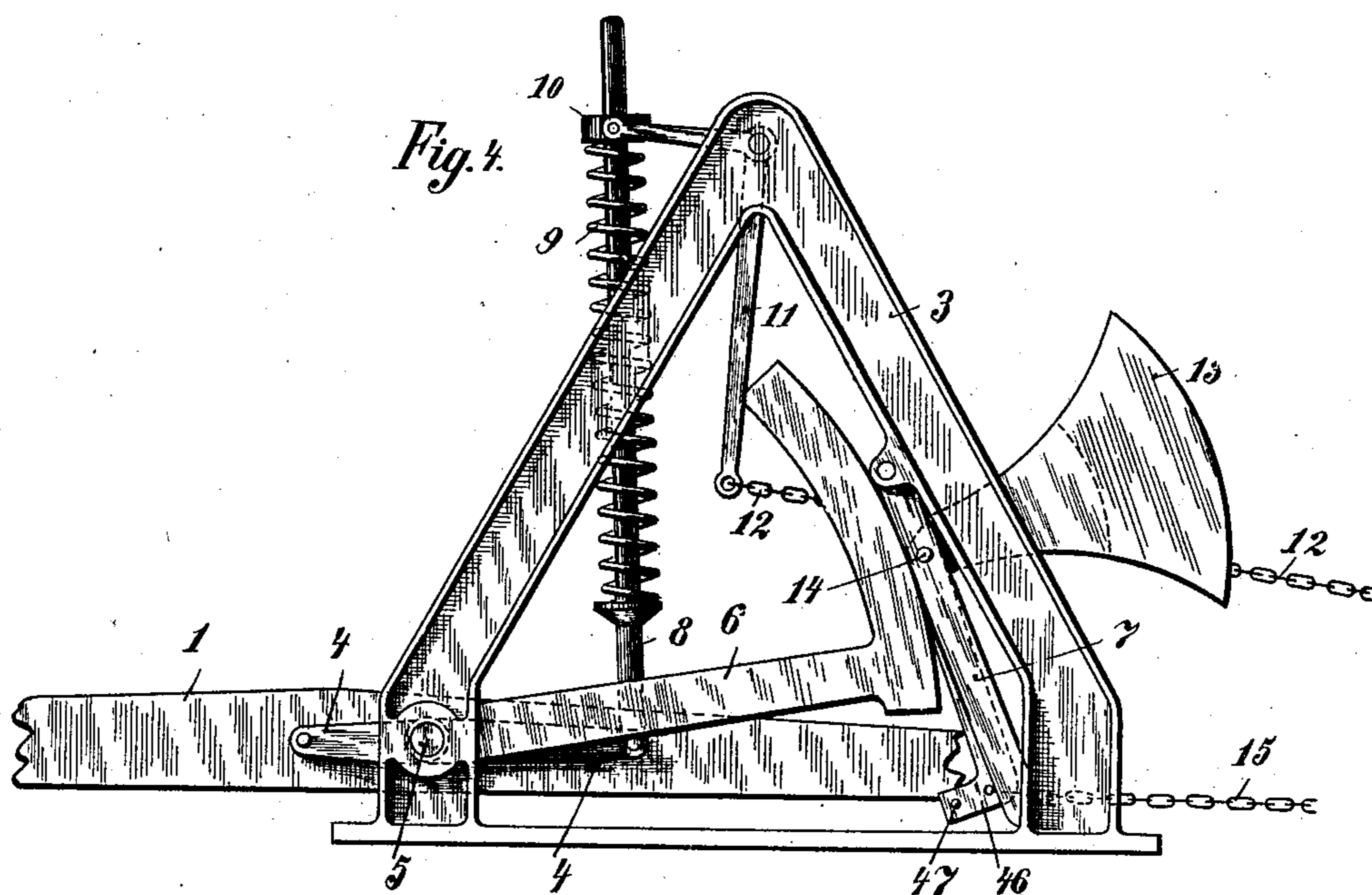
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MEANS FOR AUTOMATIC OPERATION OF BARRIERS IN RAILROAD CROSSINGS.

(Application filed Jan. 18, 1901.)

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4 Sheets—Sheet 3.



Witnesses
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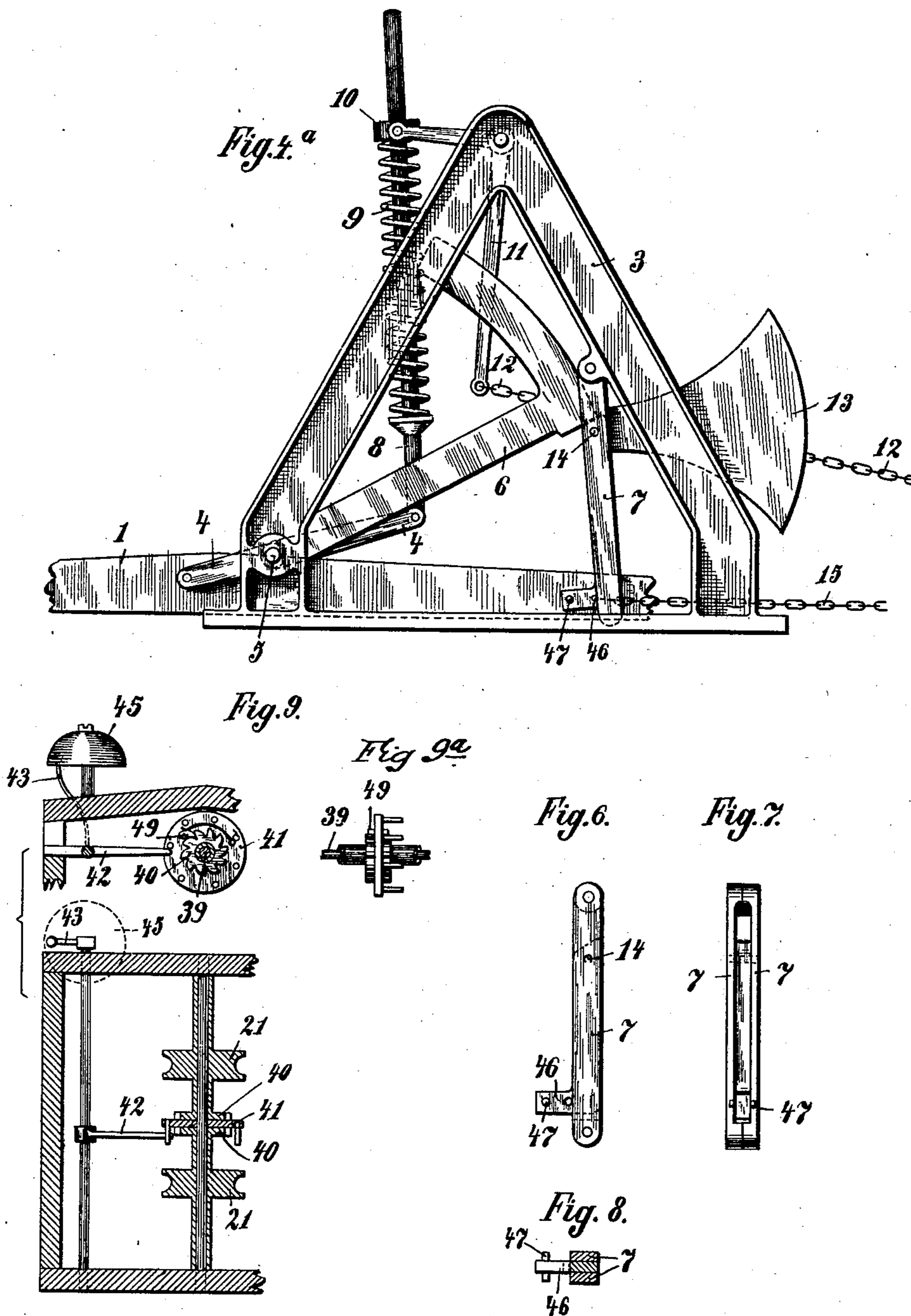
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MEANS FOR AUTOMATIC OPERATION OF BARRIERS IN RAILROAD CROSSINGS.

(Application filed Jan. 18, 1901.)

(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

HEINRICH SIEGMANN, OF GROSSENWIEDEN, GERMANY.

MEANS FOR AUTOMATIC OPERATION OF BARRIERS IN RAILROAD-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 685,303, dated October 29, 1901.

Application filed January 18, 1901. Serial No. 43,760. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH SIEGMANN, locksmith, a subject of the Grand Duke of Hesse, residing and having my post-office address at Grossenwieden, Germany, have invented certain new and useful Improvements in Means for the Automatic Operation of Barriers in Railroad-Crossings, of which the following is a specification.

The present invention relates to a device operated by the train itself for the purpose of closing and opening barriers which close railway-crossings while the train is passing. This device is so constructed that before the train reaches the barrier from either direction it will first sound a signal-bell, then automatically close the barrier and put the said bell out of operation, and, having passed the barrier, will open same, again putting the signal-bell into and out of operation. The device is essentially comprised of the following three different sets of mechanism—viz., the locking mechanisms, the disengaging mechanisms, and the mechanism serving directly to close and open the barriers. Of these mechanisms the two locking mechanisms are removed from the two disengaging mechanisms and the mechanism directly working the barriers. The means by which the barriers are closed and opened by the train by means of the mechanism referred to consist in the known manner of pressure rails or levers connected with the locking devices and operated by the wheels of the passing locomotive and train. The separate mechanisms are interconnected by means of cords, wires, chains, or the like, so that the locking mechanisms to be operated directly by the pressure rails or levers can be arranged at a sufficient distance from the mechanism directly operating the barriers and the disengaging mechanism to cause the closing and opening of the barriers by the train at the right time.

One form of the invention is represented in the annexed drawings, in which—

Figure 1 is a side view of the whole arrangement; Fig. 2, a longitudinal section of the mechanism directly operating the barriers; and Fig. 3, a front view thereof, the barriers not being shown. Fig. 3^a is a section of Fig. 3 on the line C C. Fig. 3^b is a plan view of the lever mechanism of the dis-

engaging device shown in Figs. 3 and 3^a. Fig. 3^c is an enlarged detail view of the slide 27 and adjacent parts shown in Fig. 3^a. Figs. 4 and 4^a are side views of the locking device, and Fig. 5 a plan view thereof. Figs. 6, 7, and 8 are respectively a side view, a plan, and a front view, of the catch 7 shown in Figs. 4 and 4^a. Figs. 9 and 9^a are a side view and plan, respectively, of the bell-signal, with the pulleys by which it is operated.

In the example here represented there is provided at each side of the barriers at a suitable distance therefrom a movable pressure-rail 1, arranged parallel to the track-rail, but raised slightly above the same. The said pressure rails or levers 1 are connected with the locking devices, Figs. 4 and 5, of which there are two. Each of these locking devices consists, substantially, of a double-armed lever 4, pivotally supported by a frame 3 and having fixed to its axle or shaft 5 an arm ending in a segment 6, which can be detained by a catch 7. One arm of the lever 4 is pivoted to the pressure-rail 1. The other arm carries pivoted to its end a bar 8. On said bar 8 a helical spring is placed, the lower end of which bears against a collar on the said bar and the upper end thereof bears against a ring 10, placed loosely over the bar. To the said ring 10 one of the arms of a double bell-crank lever 11 is pivoted. Two parallel arms of the said bell-crank lever 11 are pivoted to the frame 3, and to its other single arm is fastened the chain or wire 12, connecting the locking device 2 with the mechanism directly operating the barriers. The catch 7, Figs. 4 and 5 and 6 to 8, on which the lower end of the segment 6 falls when the pressure-rail is pressed down, consists in the example here represented of a link pivoted to the frame 3 and provided with a weight 13. Into the said link fits a double-armed lever 46, pivoted thereto at 14. To the lower end of the lever 46 one end of a chain or wire 15 is fastened, the other end thereof being connected with the disengaging device. The lower end of the lever 46 is rectangularly bent and provided with an abutment or pin 47. On the chain or wire 15, connected with the lever 46, being pulled said lever 46 is moved until the pin 47 abuts against the catch 7, and the latter is then moved therewith. This arrangement

facilitates the releasing of the locked rail 1, because the upper end of the lever 46, upon which the lower end of the segment 6 rests when the rail 1 is locked, is placed in an inclined position to the segment 6, which circumstance facilitates the sliding off of the said segment from the lever 46. With these locking devices, of which, as already stated, two are provided, one at each side of the barriers, the mechanism directly effecting the opening and closing of the barrier is connected by means of the chains or wires 12, attached to the bell-crank lever 11.

The construction of the mechanism operating the barriers, Figs. 2, 3, and 3^a, is as follows: In the casing 16 is fastened a plate 17, from which two bars or plates 18 are suspended by the pins 19. The said bars 18 are guided in slots in the plate 17 and a similar plate 20 below the same. To the upper ends of the said bars 18 are fastened the wires or chains 12, passing over the pulleys 21 and 22 and connected to the bell-crank levers 11 of the locking devices, Figs. 4 to 5. On the pressure-rail 1 being pressed down the catch 7, provided with the counterweight 13, engages the lower end of the segment 6, Fig. 4^a, so that the pressure-rail 1, pressed down by the train, is held locked in that position. Simultaneously with the locking of the rail 1 the spring 9 on the bar 8, pivoted to the double-armed lever 4, is compressed. As the spring 9 cannot expand again downward, owing to the locking of the rail 1, with which the lever 4 is connected, the said spring 9 presses upward the ring 10, placed on the bar 8, and thus moves the bell-crank lever 11, with which the said ring 10 is connected. The wire or chain 12, connected with one arm of the lever 11, is consequently pulled and the corresponding bar 18 is drawn upward. At the same time a signal-bell, Fig. 9, connected with the pulleys 21, is operated. As the bar 18 ascends a hook 23 at its lower end engages a hook or projection 26 on the piston 24 of an air-compressor 25 and moves the said piston upward, as indicated in Fig. 3 by dotted lines, driving the air out of the compressor, the latter being provided for the purpose of preventing too rapid movement of the parts. When the piston 24 has completed part of its stroke, a slide 27 on the said piston, moving in guides 48, is moved upward by a cam or projection 29 on the piston 24, said cam engaging another cam 28 on the slide 27. To the lower end of the said slide 27 one end of a chain or wire 30 is fastened, the other end of which passes over pulleys 31 and 32 and is directly connected with the barrier 33. As soon, therefore, as one of the bars 18 is moved the wire, chain, or the like 30 is pulled, and the barrier is thus slowly closed. As the piston 24 of the compressor 25 ascends, however, its projection 26 deflects the bar 18 not in operation in such a manner that the hook 23 at the bottom of the said bar 18 is placed underneath one arm of the lever mechanism of the disengaging device, as

shown in Fig. 3 on the right in dotted lines. The said lever mechanism consists in the present case of a rotatable shaft 35, having bearing in the casing 16 and provided with two approximately horizontal arms 36 and one downwardly-directed arm 37. The horizontal arms 36 are so arranged that on one of the bars 18 ascending the hook 23 of the other bar 18 is placed underneath one of the said arms 36. The downward arm 37 engages one arm of a horizontal double lever 38, forming the actual disengaging device, Figs. 2, 3, 3^a, and 3^b. To each end of this lever 38 is fastened the end of one of the chains, wires, or the like 15, connected with the catches 7 of the locking devices. Assuming that a train comes from the right, it will first depress the pressure-rail 1 on the right, which will be detained or locked in that position by the catch 7 of the locking device. Consequently the spring 9 is compressed and the corresponding bar 18, connected by the wire or the like 12 with the bell-crank lever 11, is moved upward and the piston 24 is also moved upward by the engagement of the hook 23 at the lower end of the said bar 18 with the projection 26 on the piston. The sliding piece 27 is carried upward with the piston 24, and the barrier connected with the latter by the chain or the like 30 is pulled down or closed. The train having passed, the barrier then depresses the other rail 1, so that the wires or chains connected with the lever 11 and the catch 7, respectively, are simultaneously pulled. The wire 12 is connected with the second bar 18 and the wire 15 with one arm of the double-armed disengaging-lever 38. Consequently the second bar 18 is pulled upward. The ascent of the first bar 18 has deflected the second bar 18 and placed it in a position to engage the corresponding arm 36, so that in ascending the said second bar 18 moves the said arm 36 upward. The double-armed lever 38, the ends of which are respectively connected with the catches 7 by the wires or the like 15, is thus operated by the vertical arm 37 in such a manner that the catch 7 of the locking device last operated is prevented from detaining the corresponding segment 6, while the catch 7 of the locking device first operated is caused to release the other segment 6 and rail 1. The spring 9 of the locking device first operated is therefore enabled to expand downwardly, so that the pull on the chain or the like 12, connected with the bar 18 which was moved first is discontinued and the corresponding bar 18 overcomes by its own gravity the weight of the chain or wire connected with it and slides down. The piston 24 and the slide 27 on the same are thus released and descend slowly with the piston 50 of the air-compressor, in doing so drawing air into the cylinder of the latter. The barrier 33, connected with the slide 27 by the wire or the like 30, is thus opened again. A similar proceeding of course takes place when a train approaches from the op-

posite direction—that is to say, from the left—in which case the second bar 18, which in the former case operated the disengaging device 38, is caused to ascend first and closes the barrier while the disengaging device 38 is operated by the bar 18 which previously closed the barrier. The apparatus can therefore be used with equal advantage on single or double track railways.

10 The signal-bell is operated by the revolution of the pulleys 21, over which the wires or the like 12, attached to the bars 18, pass. Said pulleys 21 are rotatably mounted upon a shaft 39, supported by the casing 16. To
15 the nave or hollow sleeve of each pulley 21 a ratchet-wheel 40 is fastened, adapted to be engaged by a pawl 49, of which there is one on each side of a disk 41, mounted on the shaft 39 between the pulleys 21. The said
20 disk 41 is provided with pins or projections, and on the said disk being revolved the pins operate a weighted lever 42, pivoted to the casing 16, to which lever a hammer 43 is fixed. The said hammer 43 strikes a bell 45, arranged
25 outside the casing 16 in the known manner.

What I claim is—

1. In apparatus for the automatic operation of railway-barriers, the combination with a barrier, of a slide, suitable connections be-
30 tween the barrier and slide, two bars freely suspended and adapted to be laterally deflected and provided with hooks, suitable connections between said bars and pressure-rails on each side of the barrier, locking devices
35 connected to said bars and adapted to hold the pressure-rails in their depressed position during the passage of the train thereover, suitable connections between said locking devices and the bars, a disengaging device op-
40 erated by said bars on the latter being raised, suitable connections between the disengaging and locking devices, and a signal-bell and means for operating the same substantially as described.

45 2. In apparatus for the automatic operation of railway-barriers the combination with a barrier of a slide arranged on the piston of an air-compressor, projections on said piston, suitable connections between the barrier and
50 said slide, two bars freely suspended by pins and adapted to be laterally deflected and provided with hooks adapted to engage the projections on the piston, suitable connections between said bars and pressure-rails one on
55 each side of the barrier, locking devices connected to said bars and to the pressure-rails and adapted to hold the latter in their depressed position during the passage of the train thereover, suitable connections between
60 the locking devices and the bars, a disengag-

ing device operated by said bars on one of the latter being raised by the depression of one of the pressure-rails, and a signal-bell and means for operating the same, substantially as described.

65 3. In apparatus for the automatic operation of railway-barriers the combination, with a barrier of a slide 27 arranged on the piston 24 of an air-compressor 25, projections 26 on said piston, a chain or the like 30 connecting
70 the barrier to said slide 27, two bars freely suspended by pins and adapted to be laterally deflected and provided with hooks adapted to engage the projections 26 on the piston, pressure-rails on each side of the barrier,
75 locking devices connected to said bars and adapted to hold the pressure-rails in their depressed position during the passage of the train thereover, said locking devices comprising a double-armed lever 4, pivotally sup-
80 ported by a frame 3 and under the influence of a spring 9, one arm of the said lever being pivoted to the pressure-rail and the other arm carrying a rod 8, collars on said rod, a spring between said collars the lower one of
85 which is fixed to said rod the upper one 10 being loose thereon, and pivoted to one arm of a bell-crank lever 11 pivoted to the frame 3, an arm 6 terminating in a segment, a catch
90 7 having counterweight 13 and adapted to bear on said segment, a chain or the like 12 connecting the said bell-crank lever to one of the bars 18, a double-armed lever 46 pivoted in said catch 7 and bent at its lower end and provided with projections 47, the upper arm
95 of said lever being adapted to support the lower end of the segment 6, a disengaging device operated by said bars 18 on the latter being raised, said disengaging device consisting of a shaft 35 horizontal arms 36 and a
100 downwardly-projecting arm 37 mounted on said shaft, and a horizontal double-armed lever 38, each arm of which is connected by a chain or the like 15 to one of the before-mentioned levers 46, and a signal-bell and means
105 for operating the same consisting of pulleys 21, a rotatable disk 41 provided with pins or projections mounted upon the shaft 39 of said pulleys, a weighted lever 42 provided with hammer 43 adapted to bear against said
110 pins and pawls 49 on said disk 41 for engaging ratchet-wheels 40 on the nave of the disk substantially as described.

In witness whereof I have signed this specification in the presence of two witnesses.

HEINRICH SIEGMANN.

Witnesses:

LEONORE KASCH,
C. C. STEVENSON.