No. 883,546. PATENTED MAR. 31, 1908.

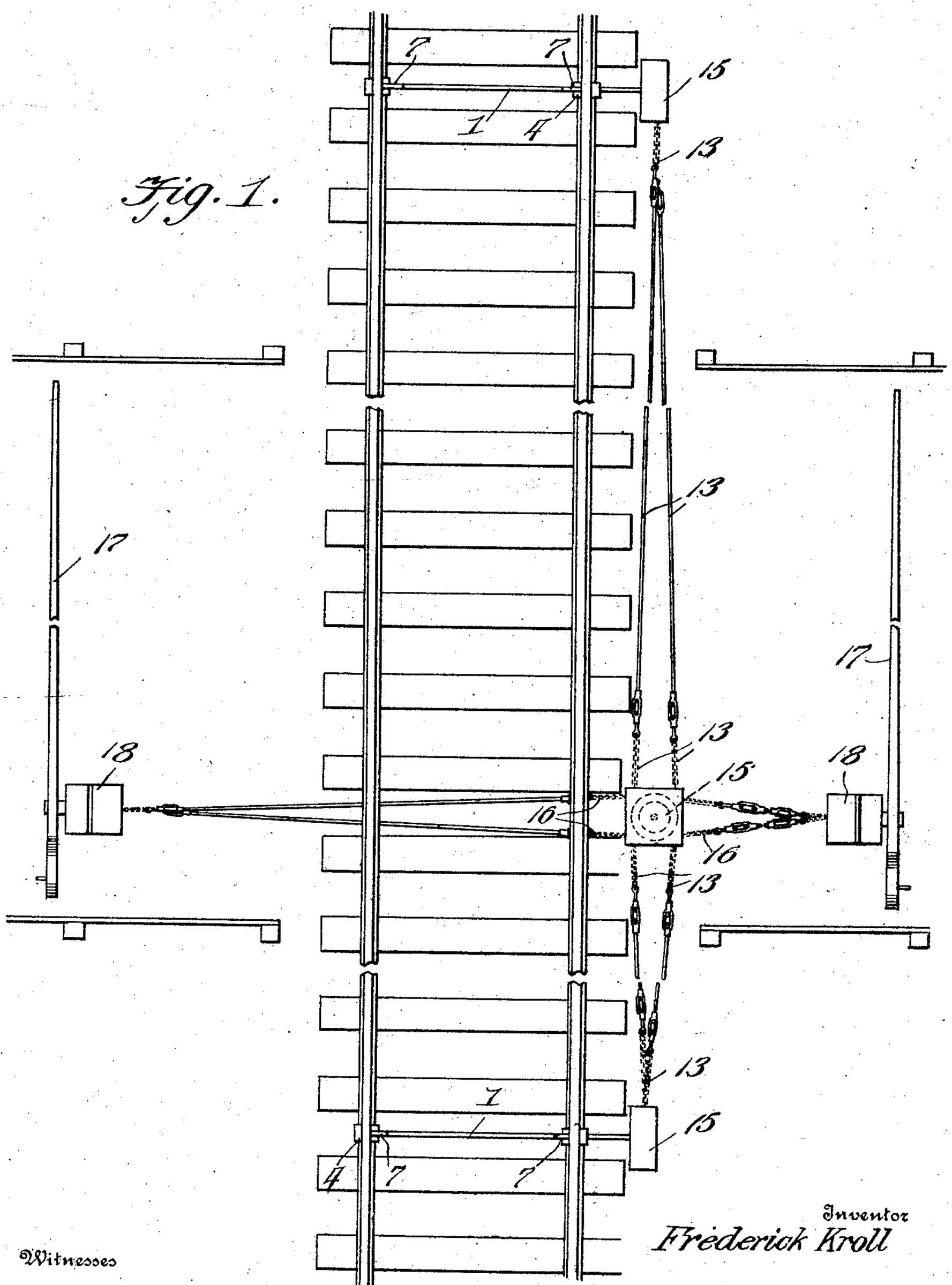
F. KROLL.

AUTOMATIC RAILROAD GATE AND SIGNAL.

APPLICATION FILED OCT. 8, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Frank B. Hoffman.

P. M. Smith.

Inventor

Frederick Kroll

By Victor J. Evans

Attorney

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3 SHEETS—SHEET 2.

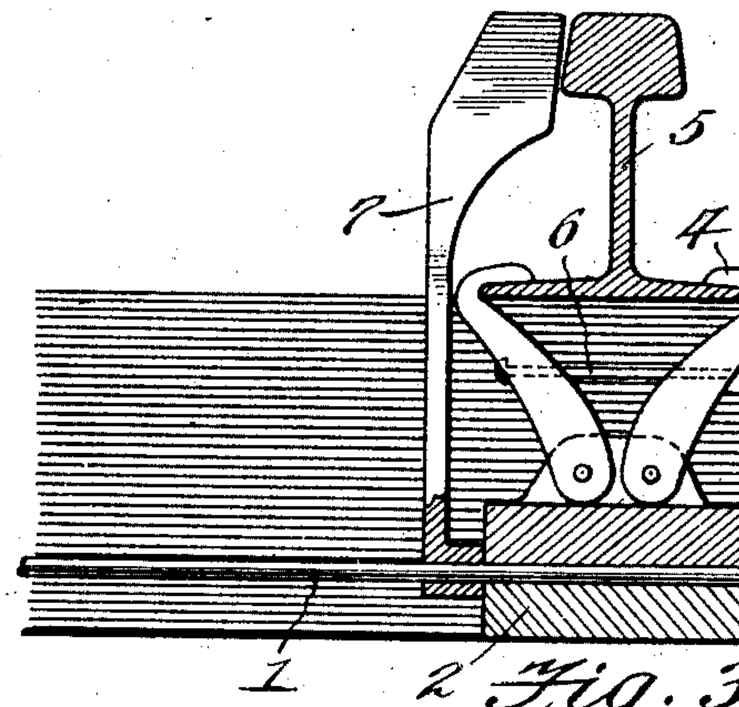


Fig. 2.

Fig. 3.

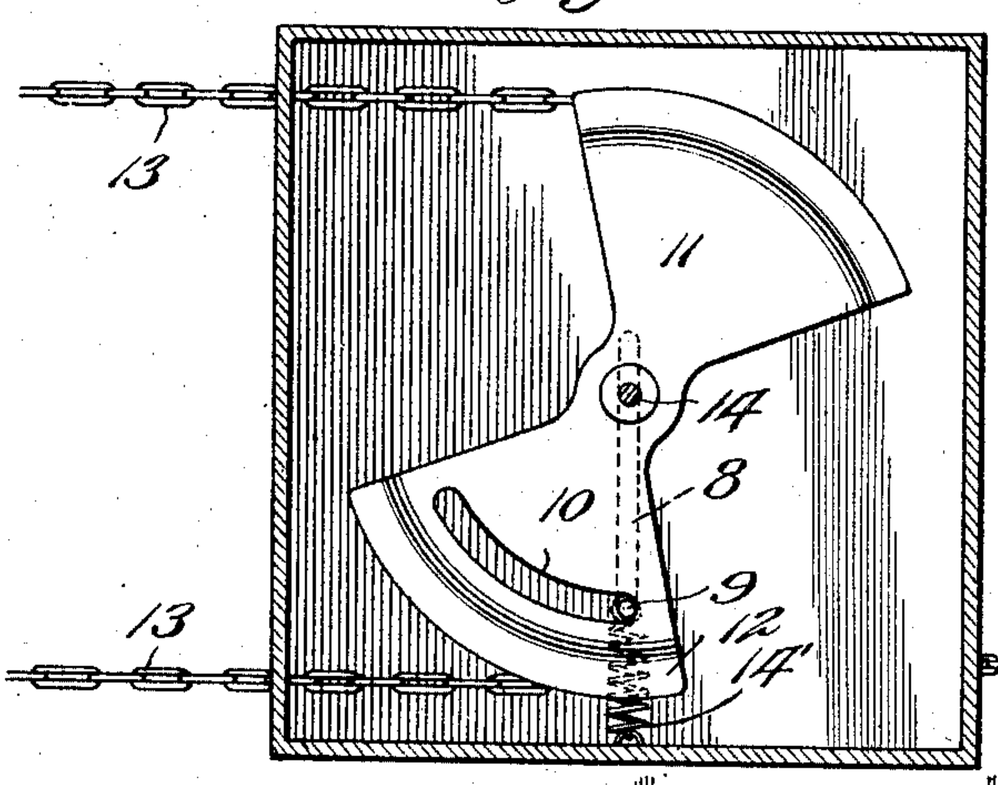
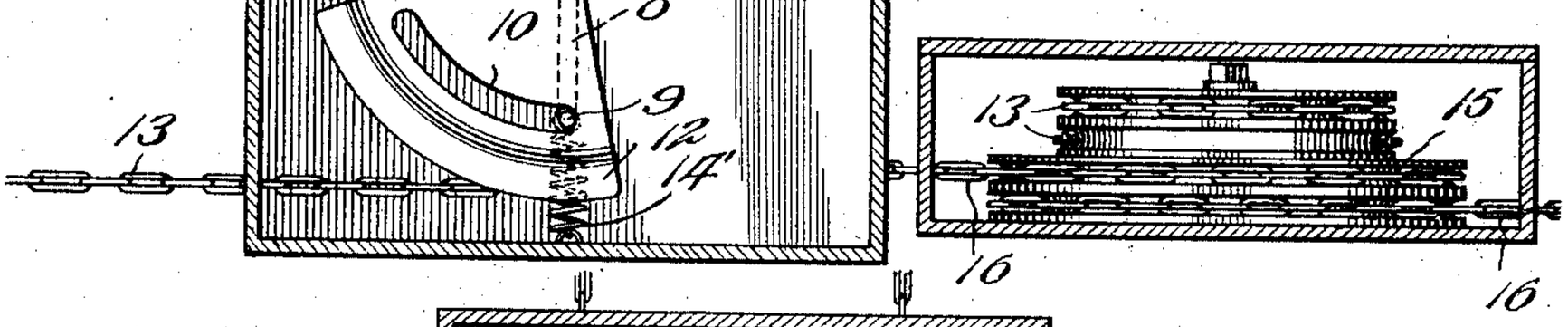


Fig. 4.



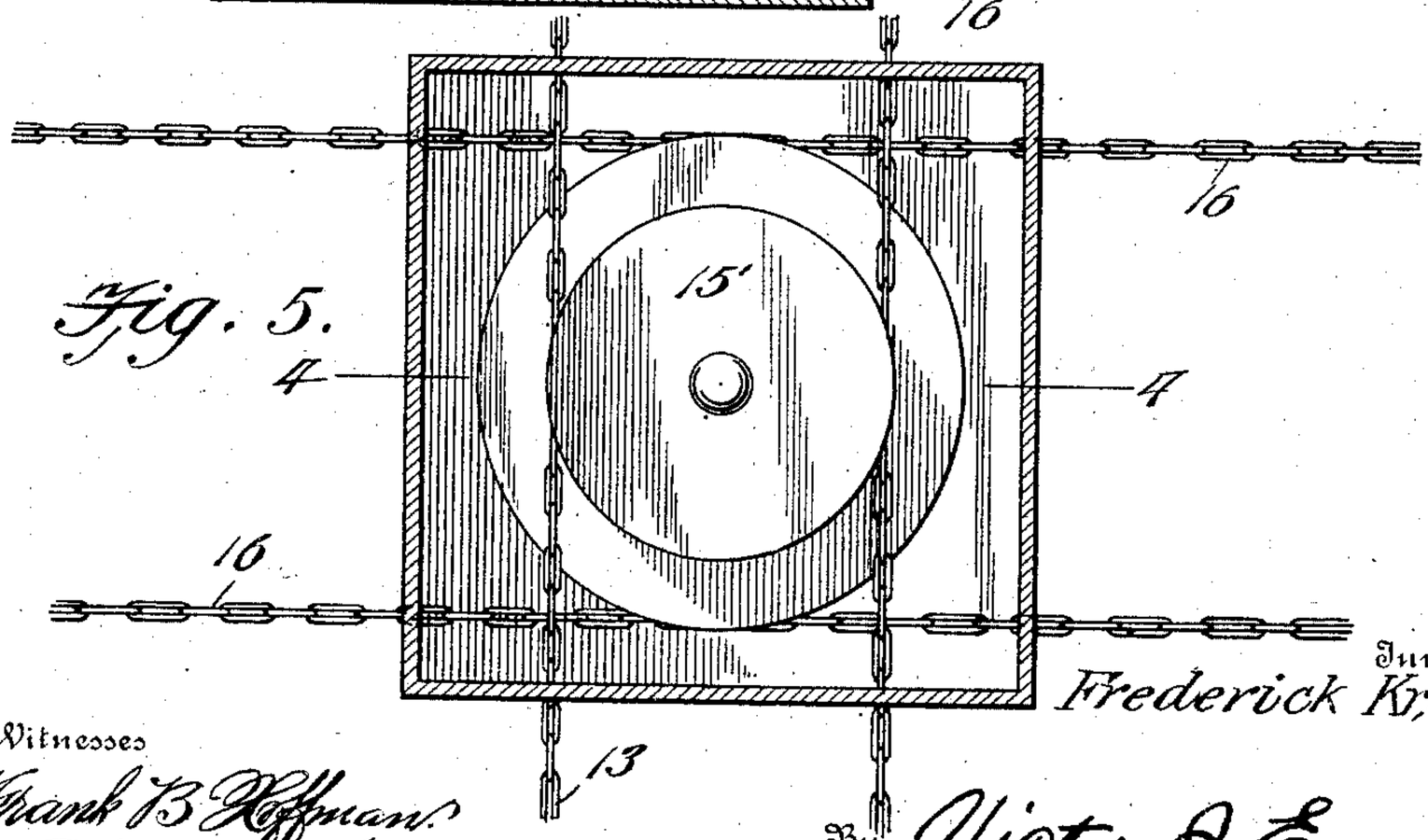


Fig. 5.

Witnesses
Frank B Hoffman
P. M. Smith

Inventor
Frederick Kroll,
By Victor J. Evans
Attorney

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3 SHEETS—SHEET 3.

Fig. 6.

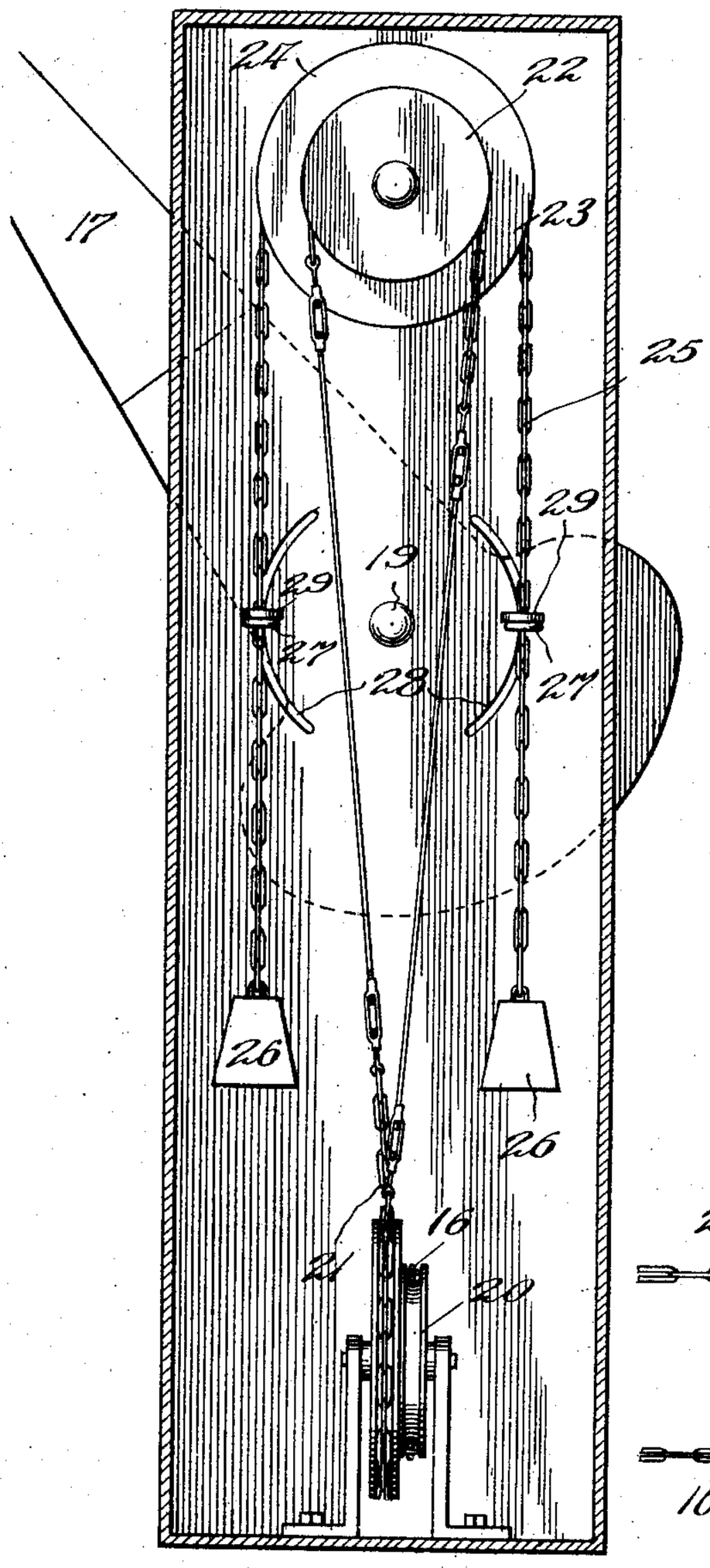
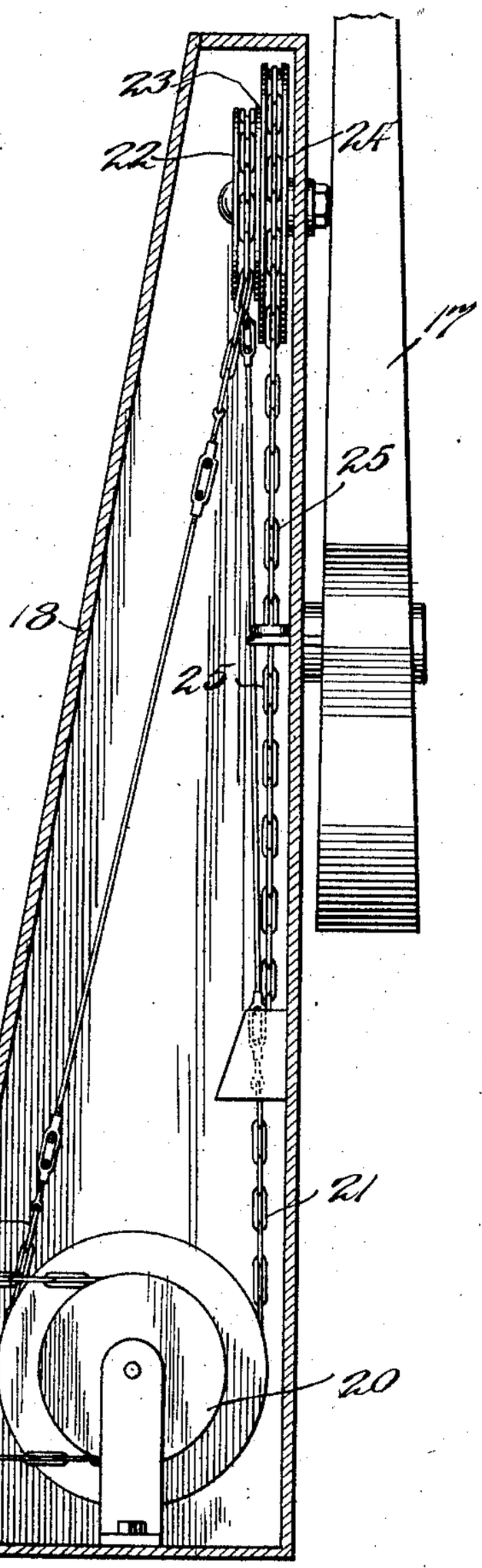


Fig. 7.



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Frank B. Hoffman

P. M. Smith.

Inventor

Frederick Kroll

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

FREDERICK KROLL, OF SEBEWAING, MICHIGAN.

AUTOMATIC RAILROAD GATE AND SIGNAL.

No. 883,546. Specification of Letters Patent. Patented March 31, 1908.

Application filed October 8, 1907. Serial No. 396,513.

To all whom it may concern:

Be it known that I, FREDERICK KROLL, a citizen of the United States, residing at Sebewaing, in the county of Huron and State of Michigan, have invented new and useful Improvements in Automatic Railroad Gates and Signals, of which the following is a specification.

This invention relates to automatic railroad gates and signals, the object of the invention being to provide simple, reliable and effective mechanism whereby a train in motion will automatically close and open the gates of a crossing road, thereby requiring no attention on the part of an attendant located at the crossing.

With the above general object in view, the invention consists in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a plan view of a railroad crossing, showing the gate actuating mechanism also in plan. Fig. 2 is an enlarged vertical cross section taken in line with the trip shaft. Fig. 3 is a vertical section taken at right angles to Fig. 2 and passing through the casing in which the trip shaft wheel is mounted. Fig. 4 is a vertical section through the master wheel casing, showing the master wheel connections leading thereto and therefrom. Fig. 5 is a sectional plan view of the same. Fig. 6 is an enlarged vertical section through one of the gate stands, showing the gate operating and balancing devices, and Fig. 7 is also a vertical section through the same taken at right angles to Fig. 6.

In carrying out the present invention, trip shafts 1 are located at any suitable distance from the grade crossing as shown in Fig. 1 to insure the closing of the gates at opposite sides of the railroad track at a suitable time before the engine reaches the cross road. This trip shaft 1 which is best illustrated in Fig. 2 is mounted in a shaft hanger consisting of a bearing 2 having pivoted thereto a pair of hanger arms 3 which extend upward and are provided with hooked extremities or inturned lips 4 which embrace the base flanges of the overlying rail 5, the said hanger arms being secured and held toward each other and in engagement with the rail by one or more clamping bolts 6. The hanger is thus connected directly to the rail without boring holes in said rail or otherwise weakening the same.

Mounted fast on the shaft 1 adjacent to each of the railroad rails is a trip arm 7, the top of which lies approximately flush with the top of the rail as shown in Fig. 2 so as to be acted upon by the flange of the foremost wheel of the train, whereby said trip arm is rocked to impart a corresponding rocking movement to the shaft 1, the purpose of which will fully appear.

The shaft 1 is provided at one end with a crank arm 8 terminating in a pin or stud 9 adapted to play back and forth in an arcuate slot 10 in what may be termed a trip shaft wheel 11 having a grooved periphery as at 12 to receive a chain or other suitable connection 13. This trip shaft wheel is journaled on a shaft 14 and is contained within a suitable protecting casing 15 at one side of the railway as indicated in Fig. 1 and is moved in one direction or the other by the action of the crank arm 8 of the trip shaft 1. The pin or stud 9 of the crank arm 8 is held approximately in a central position by means of a retracting spring 14′ which is interposed between the pin 9 and a fixed point within the casing 15′, as clearly shown in Figs. 2 and 3, said spring allowing the necessary swinging movement of the crank 8 in both directions as the trip arm 7 is acted upon by the train in the manner above explained.

The connections 13 consisting partly of chains and partly of rods extend from the trip shaft wheel 11 to a centrally arranged master wheel 15′, around which the chains or connections 13 pass and to which they are secured to prevent slippage of the chain or connection around the wheel when set in motion. By reference to Fig. 1 it will be seen that similar connections 13 extend inward to the master wheel 15′ from opposite directions so that both of the trip shafts 1 are coupled together for simultaneous operation. Thus, no matter in which way the train is moving, motion is imparted to the master wheel 15′ through the connections above described. The master wheel 15′ has four faces or grooves, two for the oppositely extending chains or connections 13 and two

others for similar chains or connections 16, the latter being secured to and passing around the master wheel 15′ and extending therefrom in opposite directions to the gates at opposite sides of the track.

Each of the gates indicated at 17 is pivotally mounted on a gate stand 18 which is preferably in the form of a hollow casing as shown in Figs. 6 and 7, 19 designating the pivot of the gate. In the base of each stand is mounted an intermediate wheel 20, having two faces around one of which passes one of the connections 16 and around the other of which passes another similar connection 21, the latter extending upward to near the top of the stand where it passes around one face or member 22 of a gate actuating and balancing wheel 23 for imparting a partial rotative movement thereto. The other face or member 24 of the wheel 23 is engaged by a chain or other flexible connection 25 the ends of which extend downward within the stand and are provided with balance weights 26. The gate 17 is provided at opposite sides of the pivot 19 with eyes 27, the shanks of which pass through arcuate slots 28 in the hollow stand 18, as best shown in Fig. 6, said slots being described on the arc of a circle of which the pivot 19 is the center. The end portions of the chain or connection 25 pass through the eyes 27 and each end portion of the chain 25 is provided with a stop collar 29 fast thereon which comes in contact with its respective eye 27 and acts thereon to rock the gate 17 upward or downward as the case may be.

From the foregoing description it will now be seen that when either one of the trip shafts 1 is rocked by the advancing train, the corresponding connections 13 will impart a partial rotary movement to the master wheel 15′. This wheel in turn will impart corresponding movement to the connections 16 which give a partial turn to the wheels 20 of the two gates at opposite sides of the railroad. The wheels 20 through the medium of the connections 21 impart a partial rotary movement to the wheel 23 the latter, through the connection or chain 25 and the stop collars or shoulders 29 acting on the eyes 27 of the gates thereby swinging said gates simultaneously to an upright or horizontal position to close or open the crossing.

While the mechanism has been described with especial reference to railroad gates, the description and claims are to be understood as comprehending railway signals as well as gates, it being apparent that the gate also has the function of a signal to parties approaching the railroad crossing.

I claim:—

1. The combination with a railroad gate, of operating mechanism therefor embodying trip shafts arranged at opposite sides of the crossing, a master wheel, flexible connections between the trip shafts and master wheel, a gate operating wheel, flexible connections between the master wheel and gate operating wheel, a flexible connection between the gate operating wheel and the gate, and counterbalance weights attached to the last named flexible connection and acting on the gate.

2. The combination with a railroad gate, of operating mechanism therefor embodying trip shafts arranged at opposite sides of the crossing, a master wheel, flexible connections between said trip shafts and the master wheel, a gate operating wheel, flexible connections between the master wheel and gate operating wheel, eyes on the gate, and a flexible connection between the gate operating wheel and the gate passing through said eyes on the gate and provided with stop shoulders which coöperate with the eyes.

3. The combination with oppositely arranged railroad gates, of trip shafts arranged at opposite sides of the crossing, a master wheel, flexible connections leading from the trip shafts to the master wheel, gate operating wheels, flexible connections leading from the master wheel to the gate operating wheels at opposite sides of the track, flexible connections interposed between the gate operating wheels and the gates and passing through eyes on the gates, and stops on said connections coöperating with the eyes of the gate.

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

FREDERICK KROLL.

Witnesses:

J. F. Hadwin,

Rudolph C. Ranke, Jr.