(No Model.) 6 Sheets—Sheet 1.

J. HAHN.

MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

No. 370,188. Patented Sept. 20, 1887.

Fig. 1,

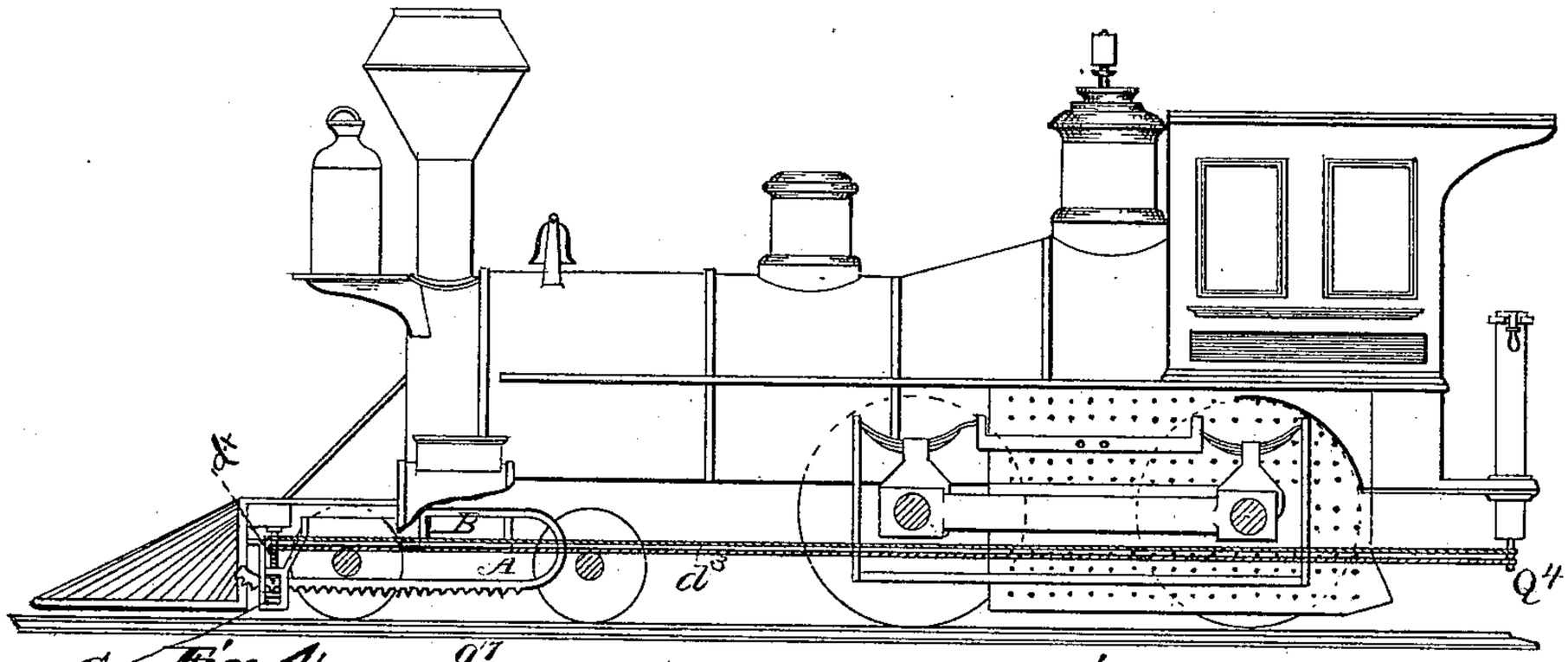


Fig. 4,

Fig. 2,

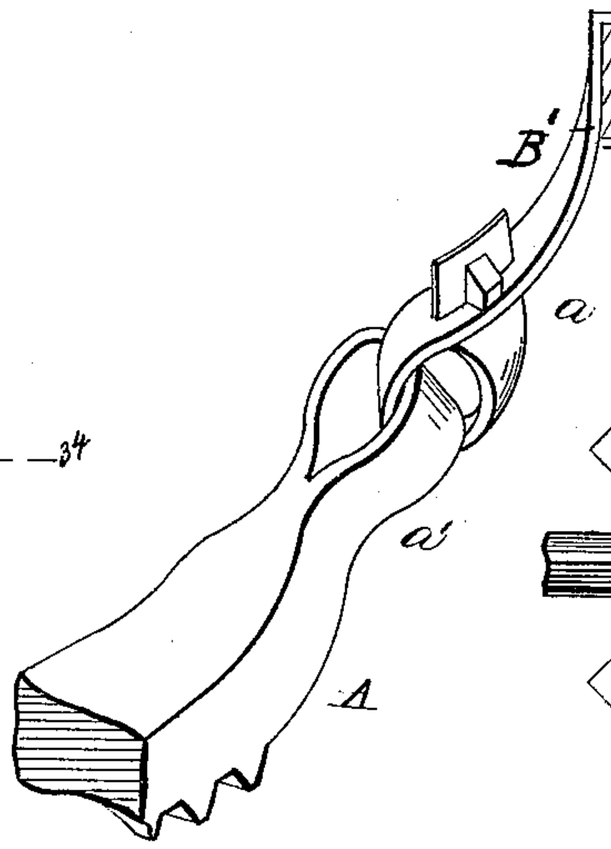


Fig. 5,

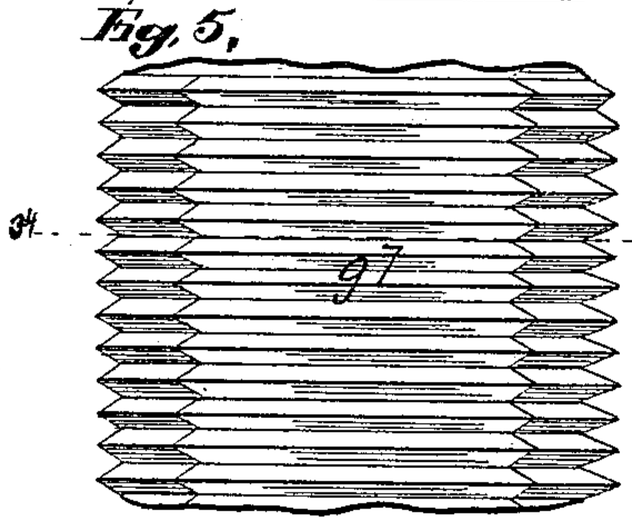
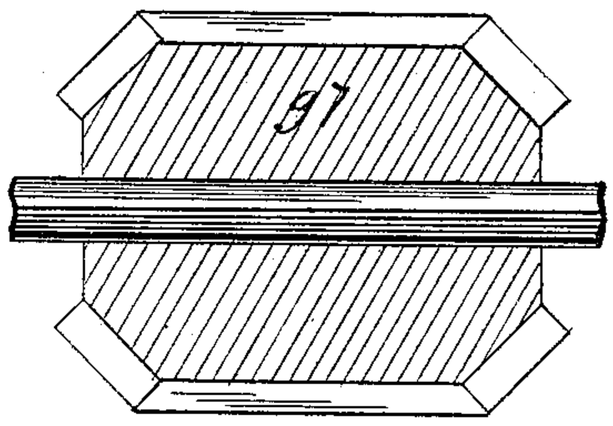


Fig. 3,



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(No Model.) 6 Sheets—Sheet 2.

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MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

No. 370,188. Patented Sept. 20, 1887.

Fig. 6.

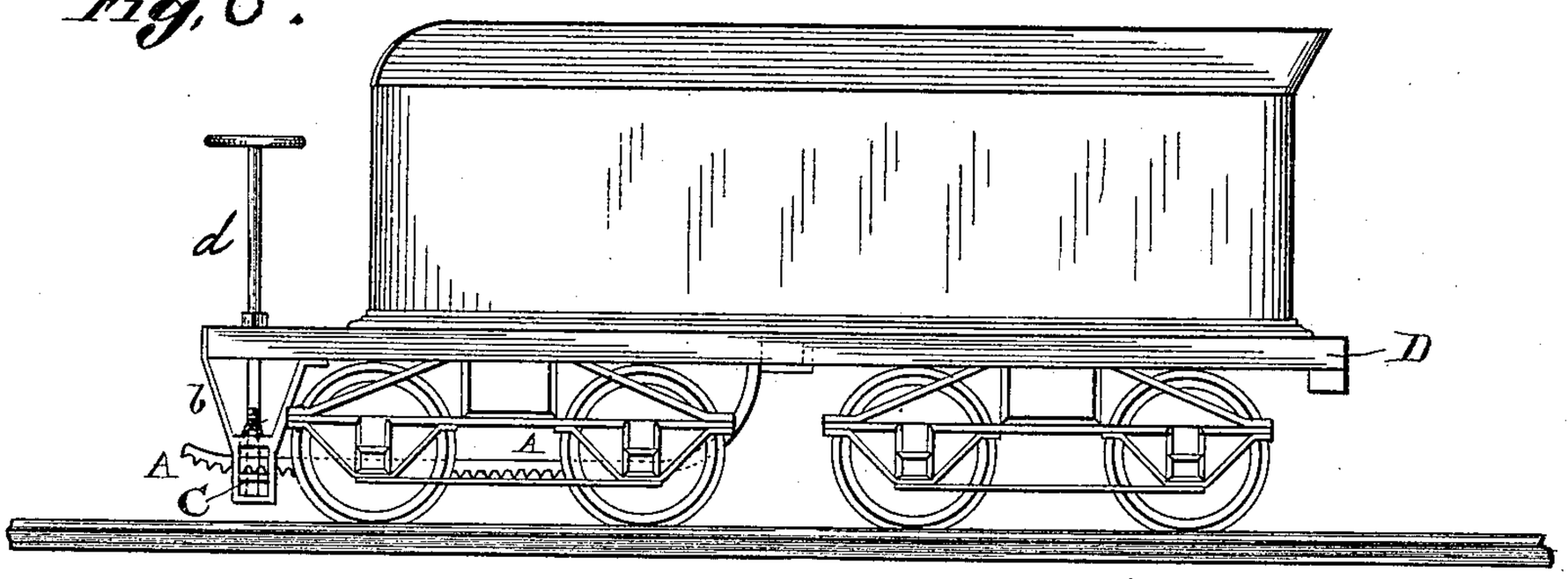


Fig. 7.

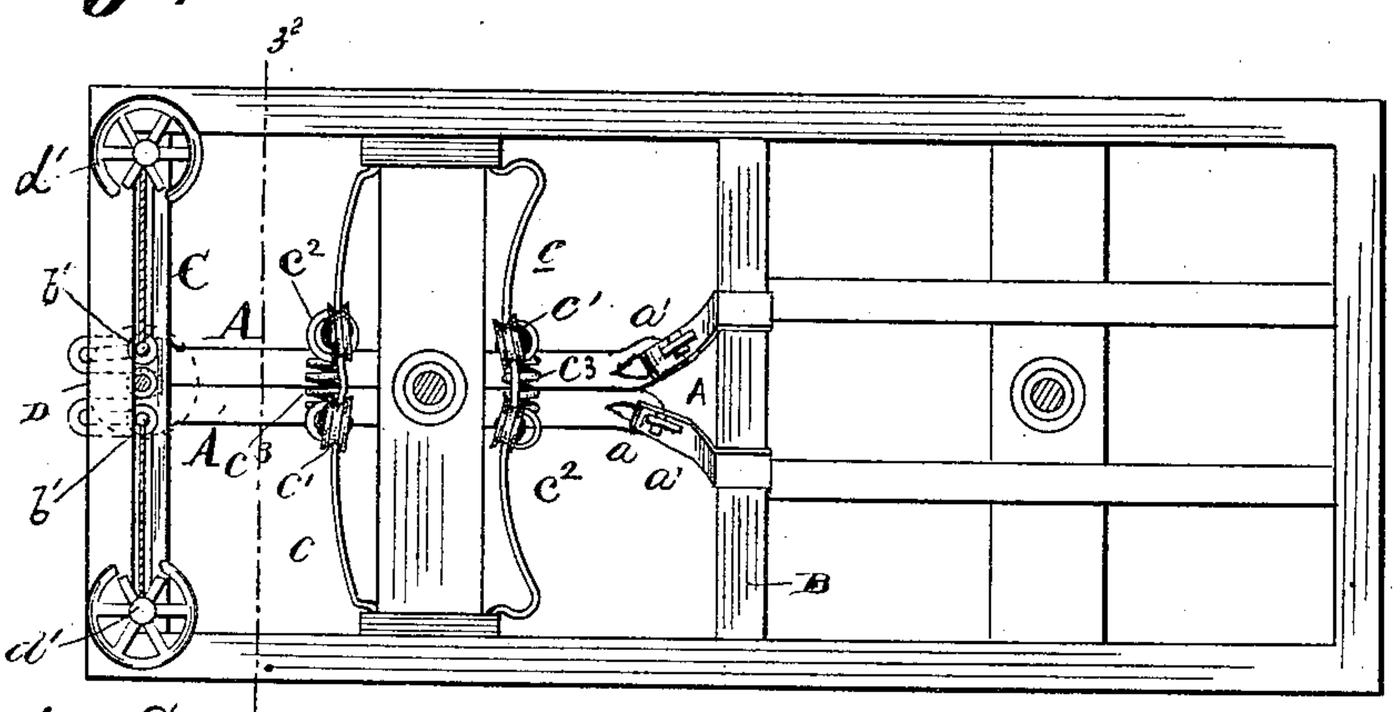


Fig. 8.

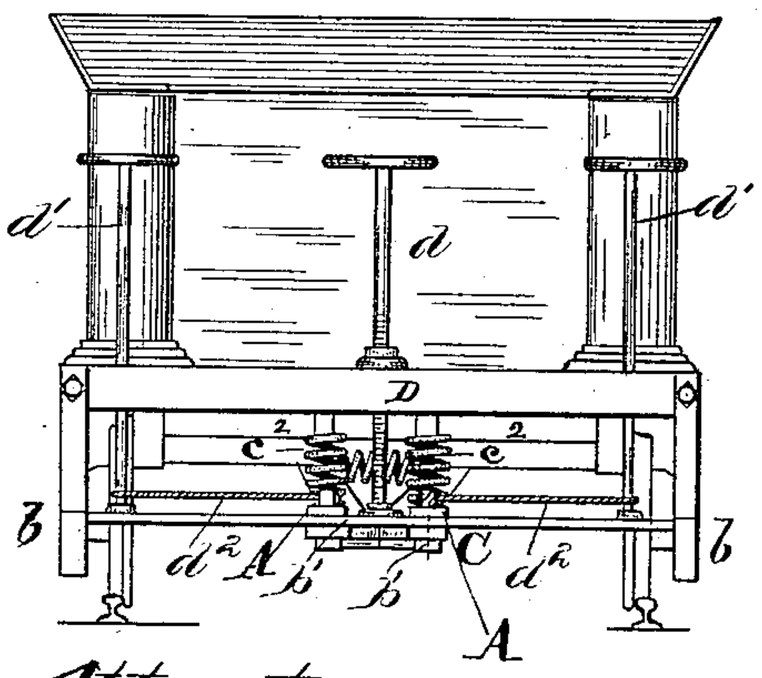
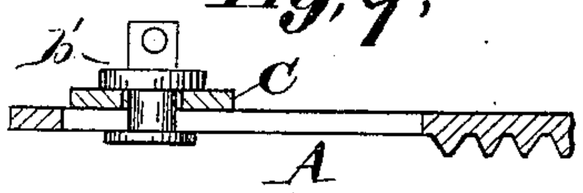


Fig. 9.



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MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

No. 370,188. Patented Sept. 20, 1887.

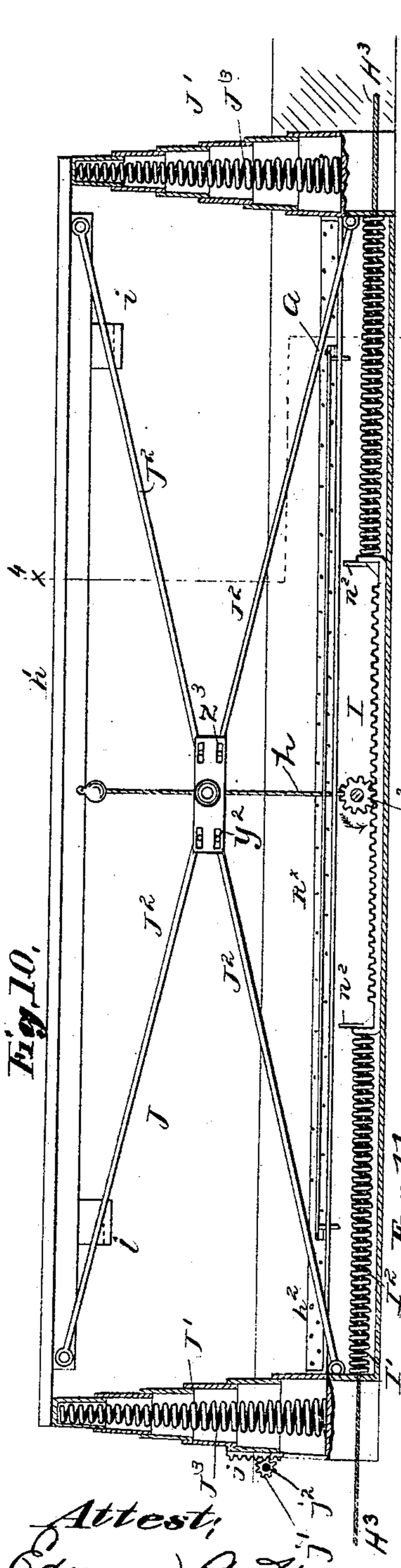

Fig. 10.

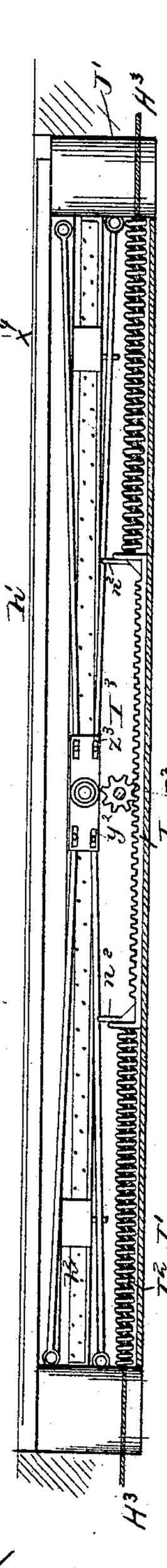

Fig. 11.

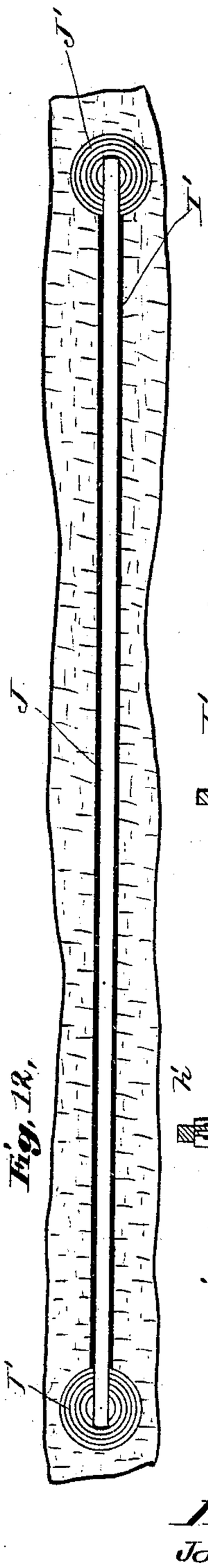

Fig. 12.

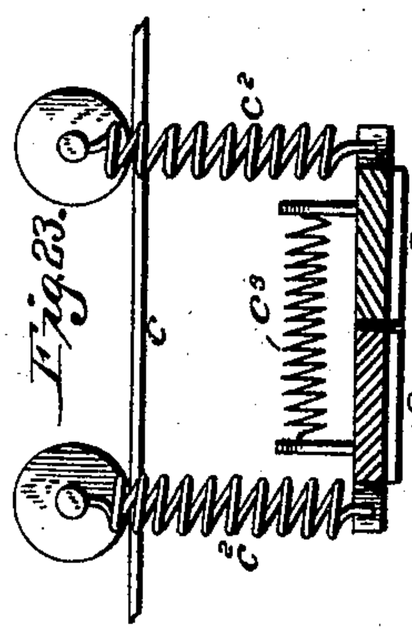

Fig. 23.

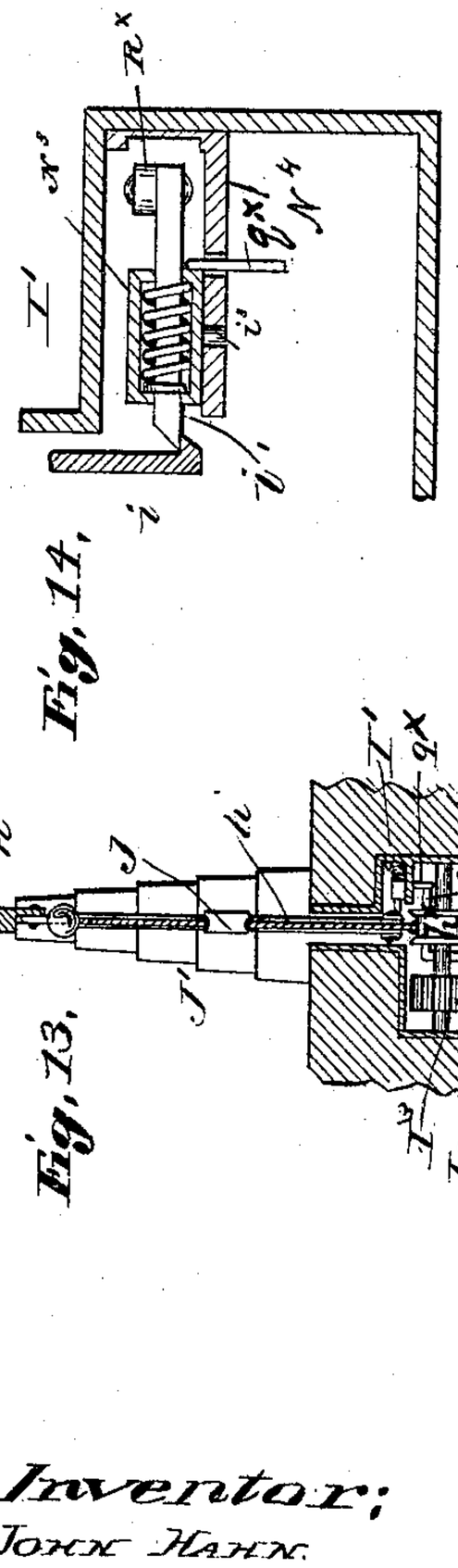

Fig. 14.

Fig. 13.

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MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

No. 370,188. Patented Sept. 20, 1887.

Fig. 15.

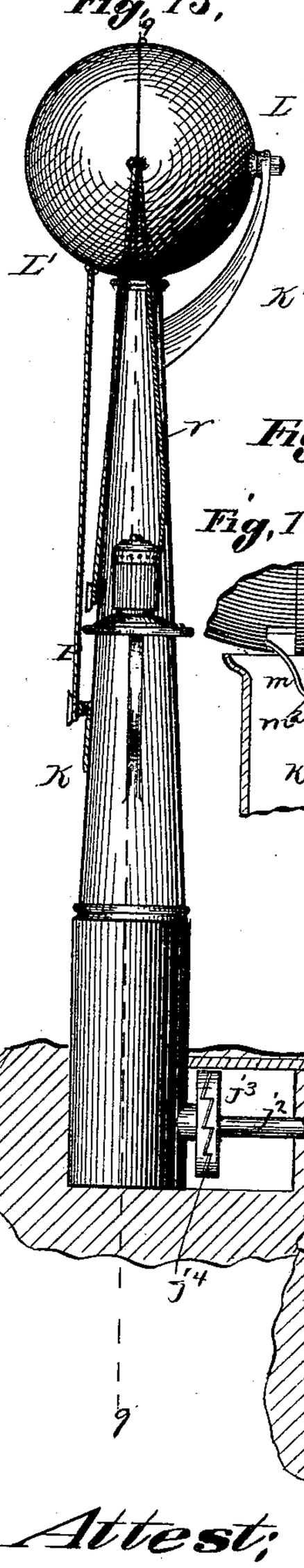


Fig. 16.

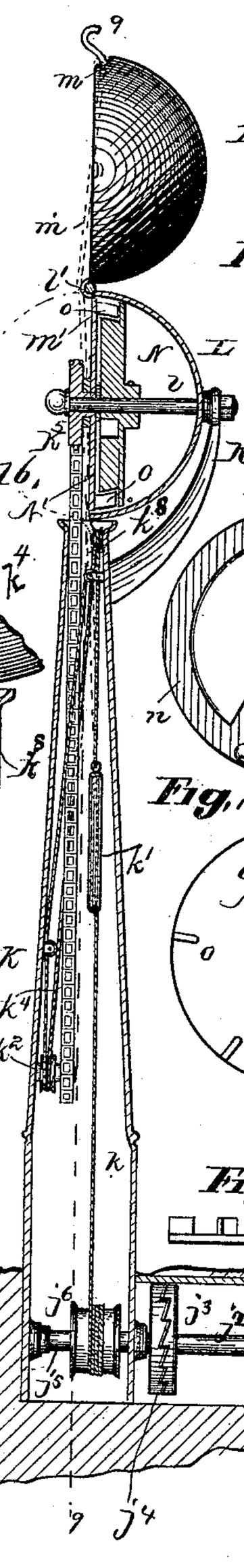


Fig. 17.

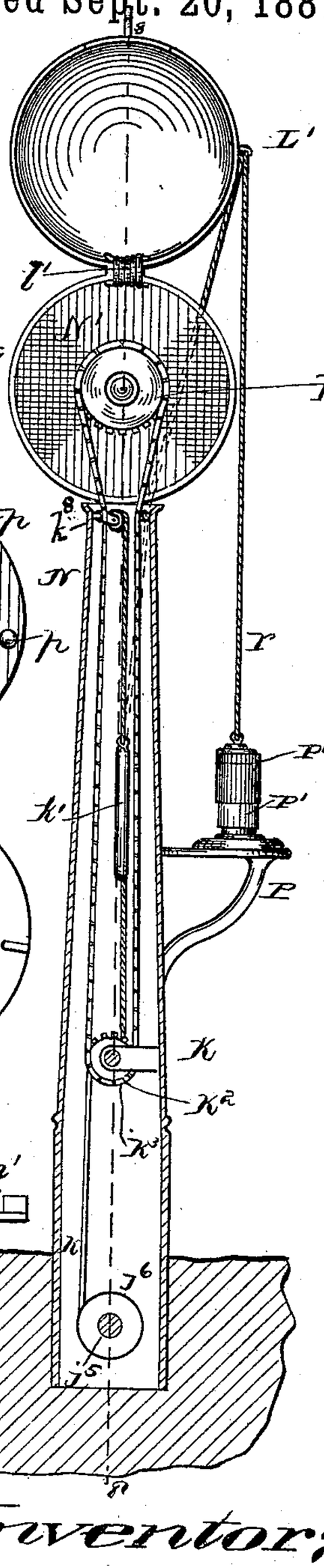


Fig. 18.

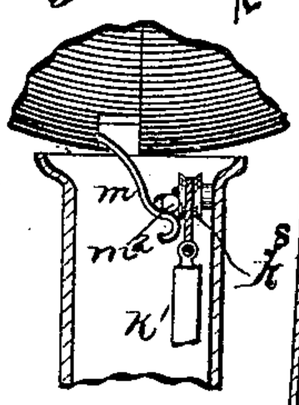


Fig. 19.

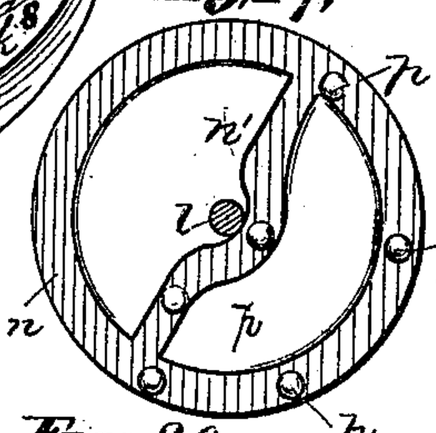


Fig. 20.

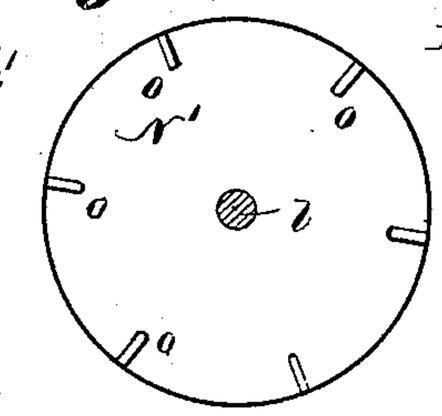
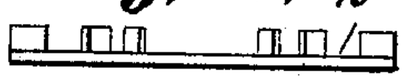


Fig. 21.



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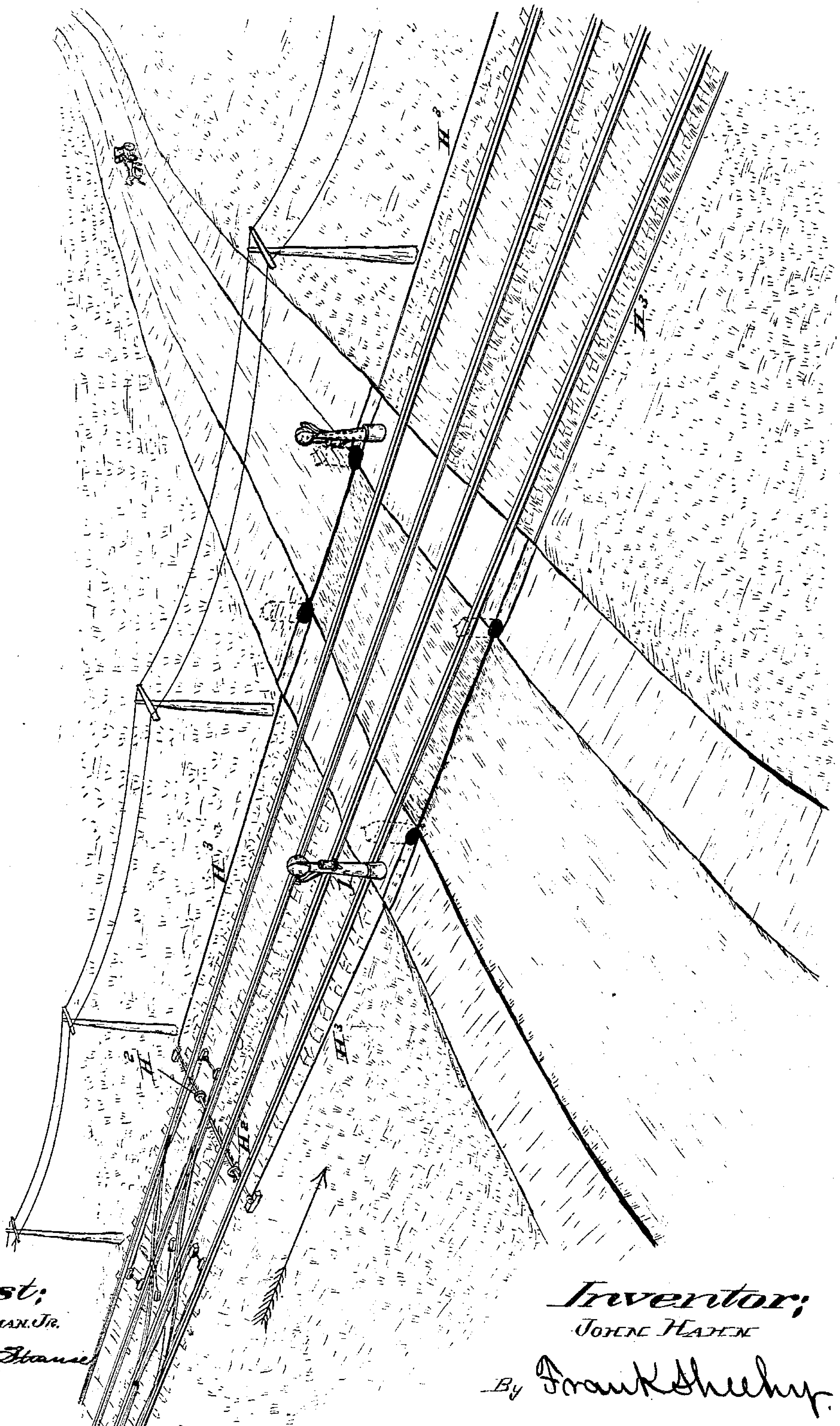
MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

No. 370,188. Patented Sept. 20, 1887.

Fig. 22.



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MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

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Fig. 25.

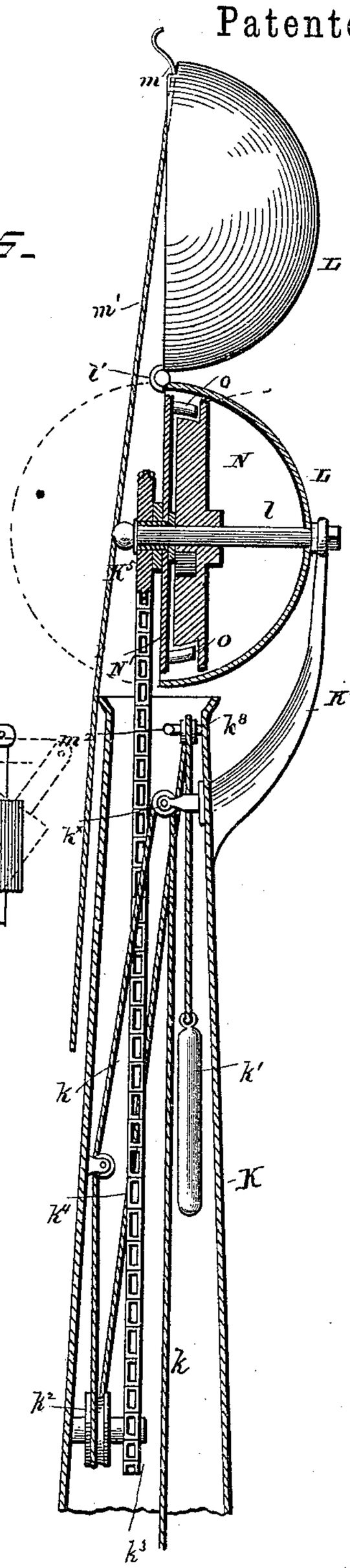


Fig. 27.

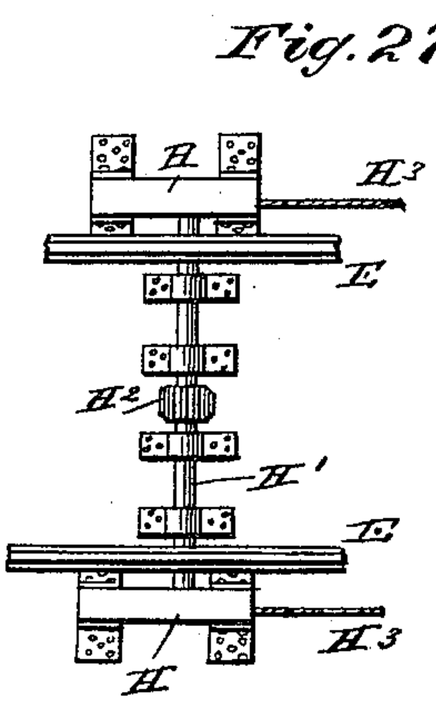


Fig. 24.

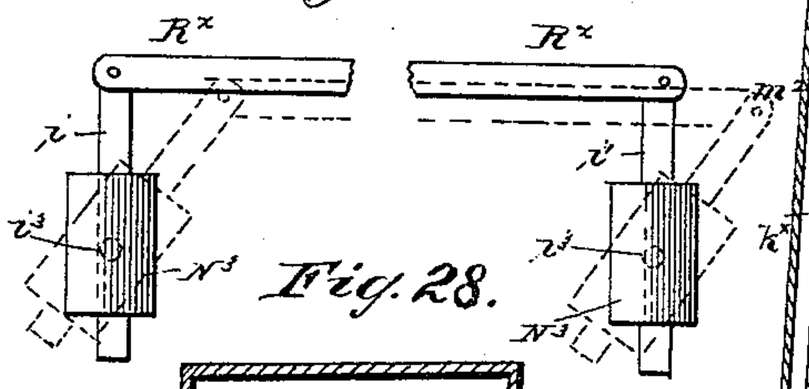


Fig. 28.

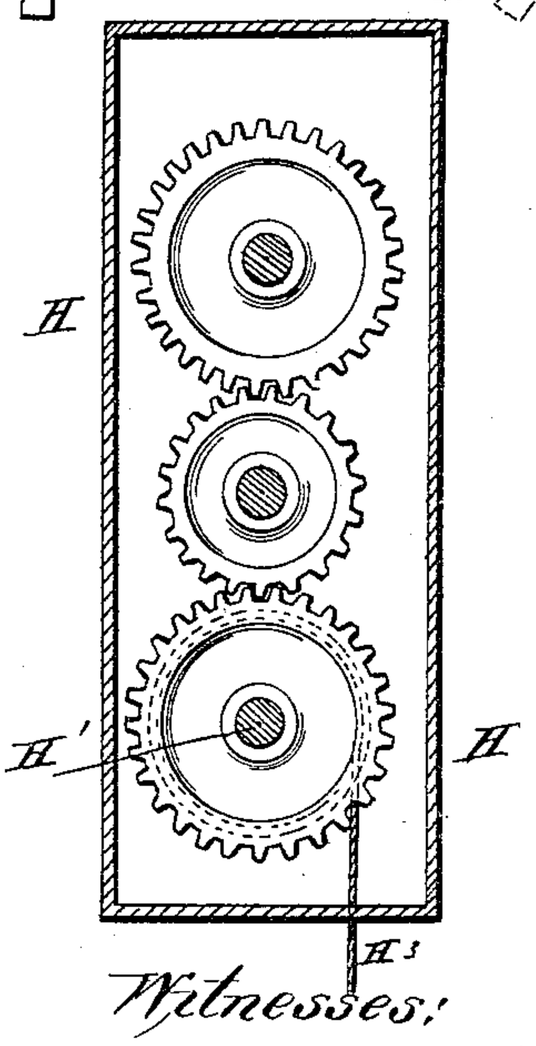
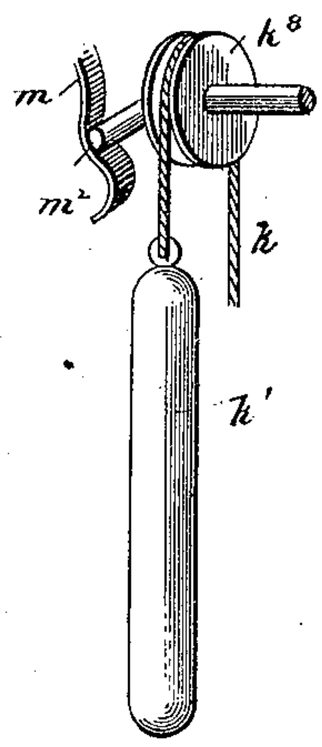


Fig. 26.



Witnesses:
Edwin L. Yewell,
James J. Sheehy.

Inventor,
John Hahn.
by Frank Sheehy.
Atty

UNITED STATES PATENT OFFICE.

JOHN HAHN, OF ST. LOUIS, MISSOURI.

MECHANISM FOR OPERATING RAILWAY GATES AND SIGNALS.

SPECIFICATION forming part of Letters Patent No. 370,188, dated September 20, 1887.

Application filed May 18, 1886. Serial No. 202,594. (No model.)

To all whom it may concern:

Be it known that I, JOHN HAHN, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Mechanisms for Operating Railway Gates and Signals; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

Figure 1 is a side elevation showing a locomotive having one of the actuating-racks applied to it. Fig. 2 is a perspective sectional view in detail showing the manner of connecting by a shackle one of the racks to a transverse sill-beam of a locomotive or tender. Figs. 3, 4, and 5 are details of one of the spurred wheels used in the roadway and adapted to engage with the said actuating-racks. Figs. 6, 7, and 8 are views showing the manner of mounting the said racks, together with the means for operating them applied to the bed of a tender. Fig. 9 is a sectional detail showing the manner of connecting the free end of one of the said racks to a transverse supporting-bar. Fig. 10 is an elevation of the railroad-gate and part of its actuating mechanism, and also part of the actuating mechanism for the signal, showing the gate erected. Fig. 11 is a similar view of the parts shown in Fig. 10, indicating the gate collapsed below the level of the roadway. Fig. 12 is a top view of Figs. 10 and 11. Fig. 13 is a vertical cross-section through Fig. 10, taken in the plane indicated by dotted line x^4 x^4 thereon. Fig. 14 is an enlarged cross-section of the automatic catch which holds the gate in the collapsed condition shown in Fig. 11. Fig. 15 is an elevation of the improved signal set for "safety." Figs. 16, 17, and 18 are sectional views of the signal-actuating mechanism. Figs. 19, 20, and 21 are views of the sounding or alarm mechanism, shown in diametrical section in Fig. 16. Fig. 22 is a perspective view showing generally my improvements applied to railroad-tracks at a common road-crossing, the actuating parts being represented only on one side of the common road-crossing; but in practice they will be on both sides thereof. Fig. 23 is an enlarged sectional view in detail, showing the manner of suspending two rack-bars so as to allow vertical and lateral contraction. Fig. 24 is a plan view in detail showing how the gate-latches are actuated by the sliding rack in the gate-pit. Fig. 25 is an enlarged view of Fig. 16, the lower parts broken away. Fig. 26 is a detail of the spring-catch *m* and its co-operating parts. Fig. 27 is a plan view of a portion of a track, showing the housings H H and the ropes for connecting the mechanism therein with the gate; and Fig. 28 is a sectional view taken through one of the housings.

This invention relates to certain novel improvements in mechanism which is designed for enabling the engineer of a train of cars to actuate gates at crossings, and also danger-signals; and the nature of the invention will be fully understood from the following description, when taken in connection with the claims and annexed drawings.

In Fig. 1 I have represented one of my improved actuating-racks A applied to the front part of a locomotive for engaging a pinion in the roadway to operate the gate; but I do not confine myself to this application, for the racks may be applied to the bed of a tender, or to a freight-car or truck or coach. Each rack is arranged longitudinally, with its teeth down and its front end curved upward, as shown in Figs. 1 and 6.

The rear end of each rack A is connected to a cross-beam, B, which may constitute part of the frame or bed of a locomotive, a tender, or other carriage. This connection consists of a clip, B′, rigidly secured to the said beam, having an eye, *a*, formed as shown in Fig. 2, with its end keyed to itself and linked to an eye, *a′*, formed on the upturned rear end of the rack A. A coupling of this kind is substantial, and it will allow the rack to be adjusted up and down and laterally, so as to compensate for wear and lost motion. The free or forward ends of the racks, when two are used, as shown in Figs. 7 and 8, are supported upon a horizontal cross-bar, C, guided by hangers *b*, and connected to this bar by means of collared studs *b′*, the necks of which pass freely through slots made through the racks and said bar C, as shown in Fig. 9. The racks A are

also sustained and guided by means of curved rods *c c*, secured at their ends to the car-bed, upon which grooved wheels *c'* are free to roll, from which wheels the racks are suspended, as shown in Figs. 7 and 23. These rollers have any suitable upper bearing, to prevent their being lifted from their tracks. Springs c^2 are also employed in connection with the racks for keeping them down, and springs c^3 are used for retracting the racks laterally, so that normally they will assume the parallel position shown in Fig. 7. This construction is especially designed for locomotive-tenders. These racks A are vertically adjustable, and are raised out of action from certain spurred wheels between the rails on the road-bed, and also caused to engage therewith by means of a vertical screw-threaded shaft, *d*, provided with a hand-wheel, and tapped through a nut, which may be secured to the tender-bed D, and connected by a swivel to the transverse supporting-bar C at the middle of its length, as shown in Fig. 8. I also employ two vertical shafts, *d' d'*, provided with hand-wheels and connected by chains d^2 d^2 to the collared studs *b' b'*. By turning these shafts a person can wind the chains upon them and move the racks laterally, so as to bring them into alignment with the spur-wheels on the road-bed between the rails. When the said shafts are turned so as to unwind the chains d^2 d^2, the springs c^3 will retract the racks.

By reference to Fig. 1 it will be seen that I omit the long hand-shaft *d' d'* and employ a short winding-shaft, $d^\times$, which is connected by an endless chain, d^3, to a vertical winding-shaft, Q^4, located on the cab-platform, and in a convenient position to the engineer. The front end of the rack A is raised or lowered by turning the hand-shaft Q^4 on the platform of the cab to the right or left. The screw-shaft $d^\times$ is connected to the bar C similarly to the hand-shaft *d*. (Shown in Fig. 8.)

While I have shown and described in this case the longitudinal racks, means for adjustably connecting the same with a car-bed or tender, means for raising and lowering the racks, and also means for moving the same laterally, yet it is not desired that such should be claimed in the present case, as such devices are shown, described, and claimed in another application, dated April 25, 1887, Serial No. 236,073.

H H designate two cases or housings, which afford bearings for a horizontal transverse shaft, H', carrying at the middle of its length a spur-wheel, H^2, preferably beveled, as shown in Fig. 27. The cases H H inclose winding-drums and trains of wheels, and on the drums are wound chains H^3 H^3, which are carried along the track outside of the rails, and connected to the upturned ends of a horizontal rack, I, of each gate, which rack is allowed to receive endwise movements in a pit located outside of the rails and across the road. This pit is narrow and of any desired length. It is formed with a casing, I', and is of such depth as to receive a folding gate. Between the ends of the sliding rack I and the ends of the pit-casing are helical springs I^2, the object of which is to hold the rack in the position indicated in Fig. 10. The rack-teeth engage with a spur-wheel, I^3, the short shaft of which is journaled in the sides of the pit-casing, and has one end of a chain, *h*, secured to a drum, $h^\times$, keyed on it, as shown in Fig. 13, the other end of which chain is secured to the top horizontal rail, *h'*, of a gate, J. This gate-rail is rigidly secured to the upper tubular sections of two telescopic posts or pillars, J' J', the lowest or largest sections of which are mounted on a substantial foundation, and rigidly connected by means of a sill-beam, h^2, or its equivalent.

The posts J' J' are composed of many tubular sections adapted to slide one within the other, and the gate is rendered substantial by means of diagonal braces J^2, pivoted at their outer ends, so that the rail *h'* can approach the sill-beam and lie in the pit-case level with the surface of the roadway, as shown in Fig. 11. The coiled springs J^3 J^3 inside of the telescopic posts shown in Fig. 10 are for the purpose of throwing up or elevating the gate to the position shown in the figure last referred to.

In combination with the folding gate and its elevating-springs J^3, I employ, near each end of the gate and below the level of the roadway, inclosed in the case I', a box, N^3, which is connected to the shelf N^4 by a pivotal rivet, i^3. Inside of each box N^3 is a bevel-nose spring-bolt, *i'*, adapted to engage with a bevel-nose catch, *i*, when the gate is fully depressed by the means above described. The two bolts *i'* are pivotally connected by a rod, $R^\times$, so that when one is moved the other is also moved. Depending from and secured to one end of each bolt-box N^3 is a stud, $q^\times$, which passes freely through a slot made through the shelf N^4, and which is intended to be in alignment with the angular extensions n^2 of the endwise-sliding rack-bar I. Now, it will be seen that when the bar I is moved by the depression of a rack-bar, A, in the direction toward the approaching train until one of its angular extensions n^2 strikes a stud, $q^\times$, the two bolts and their boxes will be simultaneously switched away from their respective catches *i i*, thus allowing the springs in the telescopic pillars to raise the gates. As the train leaves the gates, the engineer will again depress a rack-bar, A, and cause the rack opposite angular extension n^2 to strike the opposite studs $q^\times$ and align the bolts *i* with respect to the rack-bar extension n^2 again, and simultaneously, by the winding up of the connection *h* upon the drum $h^\times$, the gate will be collapsed, and will be locked in this position by the engagement of the catches Q' Q'. Thus it will be seen that the engineer can cause the gates at a road-crossing to be raised during the passage of a train, and can depress the gate again after crossing the road.

It will thus be seen that a person on a moving locomotive, tender, or cars can, by simply

adjusting a rack A into alignment with the spur-wheel H^2, depress the gate into the pit-case below the surface of the roadway.

By reference to Fig. 10 it will be seen that I provide the lowest vertically-movable section of one of the telescopic posts J′ with a vertical rack, j, the teeth of which engage with a beveled spur-wheel, j', keyed on a shaft, j^2, suitably journaled, and having a pitched-tooth half-clutch, j^3, keyed on it, as shown in Fig. 16, and engaging with a similar half-clutch, j^4, keyed on a shaft, j^5, which has its bearings in a base portion of a hollow post, K. It will be seen that when the engineer raises the gate above described the rack j, acting through the medium of the spur-wheel j', shaft j^2, and clutch, will turn the shaft j^5 in one direction, and with it a flanged drum, j^6, that is keyed on it. Around the flanged drum j^6 is wound a chain, k, provided with a tripping-weight, k', and carried nearly to the top of the post K, passed over a grooved pulley, $k^\times$, thence carried down and passed around another grooved pulley, k^2, which is keyed on a short shaft journaled in bearings fixed in the inside of the post K. The chain k is thence carried up and passed over grooved pulley k^8, and depending from its end is the weight k'. On the shaft of the pulley k^2 is keyed a rag-wheel, k^3, around which is passed an endless chain, k^4, which is carried up through the top of the post K and passed around a rag-wheel, k^5, keyed on a horizontal shaft, l, which is journaled in the center of a hollow body, L, rigidly secured to the post K by means of a bracket-arm, K′. The other half or danger-signal, L′, of the body L is hinged to the upper edge thereof, the hinge being provided with a coiled spring, l', the office of which is to throw up the hemisphere L′ to the position shown in Figs. 16 and 17, indicating "danger"—that is to say, that a train of cars is approaching the crossing. The edge of the hinged hemisphere L′ is provided with a spring-catch, m, having a curved engaging end, which, when the hemisphere L′ is closed against its fellow, as shown in Fig. 15, by drawing down on the chain m', (indicated in dotted lines in Fig. 16 and in full lines in Fig. 25,) will engage with a pin, m^2, (shown in Figs. 18 and 26,) and hold the said hemisphere closed. When the drum j^6 is rotated so as to wind up the chain k and allow the tripping-weight k' to strike the end of the catch m, the catch will be released from its pin m^2, and the hemisphere L′ will be thrown up by its spring l'. The chain m' (indicated by dotted lines in Fig. 16) is carried down outside of the post K, and may be fastened to it in a convenient position to be reached by an attendant.

N indicates a channeled disk secured rigidly in the hemisphere L, and receiving centrally and freely through it the shaft l. This disk has in its face a circular channel, n, and a diametrical inclined channel, n'. In close relation to the channeled face of this disk N, and keyed on the shaft l, is another disk, N′, provided on its face with buckets or blades o, the object of which is successively to lift balls $p\ p$ when shaft l is rotated and allow them to fall through the channel n' and strike the hemisphere L, which is so constructed and mounted that it serves as a gong for giving a ringing sound when so struck, thus affording an audible indicator.

At a suitable elevation I secure to the post K a bracket, P, on which is a lamp or lantern, P′, provided with a vertically-movable hood or shade, P^2, which is opaque. This shade is suspended by a chain, r, which is passed freely through an eye attached to the hemisphere L and carried down and attached to the post K at any suitable point, so that when the signal L′ is caused to assume the position indicated in Fig. 17 the shade P^2 will be lifted and expose to view the light of the lamp, thus giving signals at night in addition to the day visible and audible signals.

Having thus described my invention, I claim as new—

1. The combination of a shaft, H′, on the road-bed, provided with a toothed wheel and winding-drums, vertically-movable gates crossing the roadway, and chains H^3, connecting the said winding-drums with the mechanism for actuating the gates, the said shaft being operated by a vertically-movable rack adjustably applied to a railway-carriage and under the control of the engineer, substantially as described.

2. The combination, with the gate-actuating devices in the road-bed adapted to be operated by the locomotive, of a gate having spring-actuated telescopic posts braced and adapted to fold into a pit-casing, the spring-actuated sliding rack connected to the devices in the road-bed and provided with angular offsets, and a latching and unlatching device, substantially as described.

3. The combination of a gate, having spring-actuated telescopic posts and braced and adapted to fold into a pit below the level of the roadway, with the spring-actuated sliding rack connected to winding-up and unwinding devices on the roadway, and an automatic latching and unlatching device for said gate, substantially as described.

4. The combination, with a gate provided with spring-actuated telescopic posts, of latches, connected spring-actuated bolts provided with pivotal boxes, the depending lugs, angular offsets on a sliding rack, a pinion engaging therewith, a winding-drum on the pinion-shaft, and a chain connecting the winding-drum with the gate, substantially as described.

5. The combination, with a telescoping gate-post inclosing an elevating-spring, of a rack applied to one of the vertically-movable sections of this post, a chain and winding-drum on a shaft journaled in a signal-bearing post, a pinion engaging with said rack, an intermediate clutch device, an alarm-signal device fixed to said post, a visible signal hinged to

the alarm-signal, a spring for throwing up the signal or hemisphere, a spring-catch for fastening it shut, and a releasing device for this catch, substantially as described.

6. A railway-gate having telescopic posts, in combination with elevating-springs therefor, a locking device, and means for collapsing the said posts, substantially as described.

7. The combination, with a railway-gate having telescopic posts, of a signaling device and means for connecting the latter with one of the movable sections of said post, substantially as described.

8. The combination of the hinged hemispherical spring-actuated signal with the vertically-movable shade of a night-signal and the flexible connection, substantially as described.

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

JOHN HAHN.

Witnesses:
B. W. FERGUSON,
JAMES J. SHEEHY.