

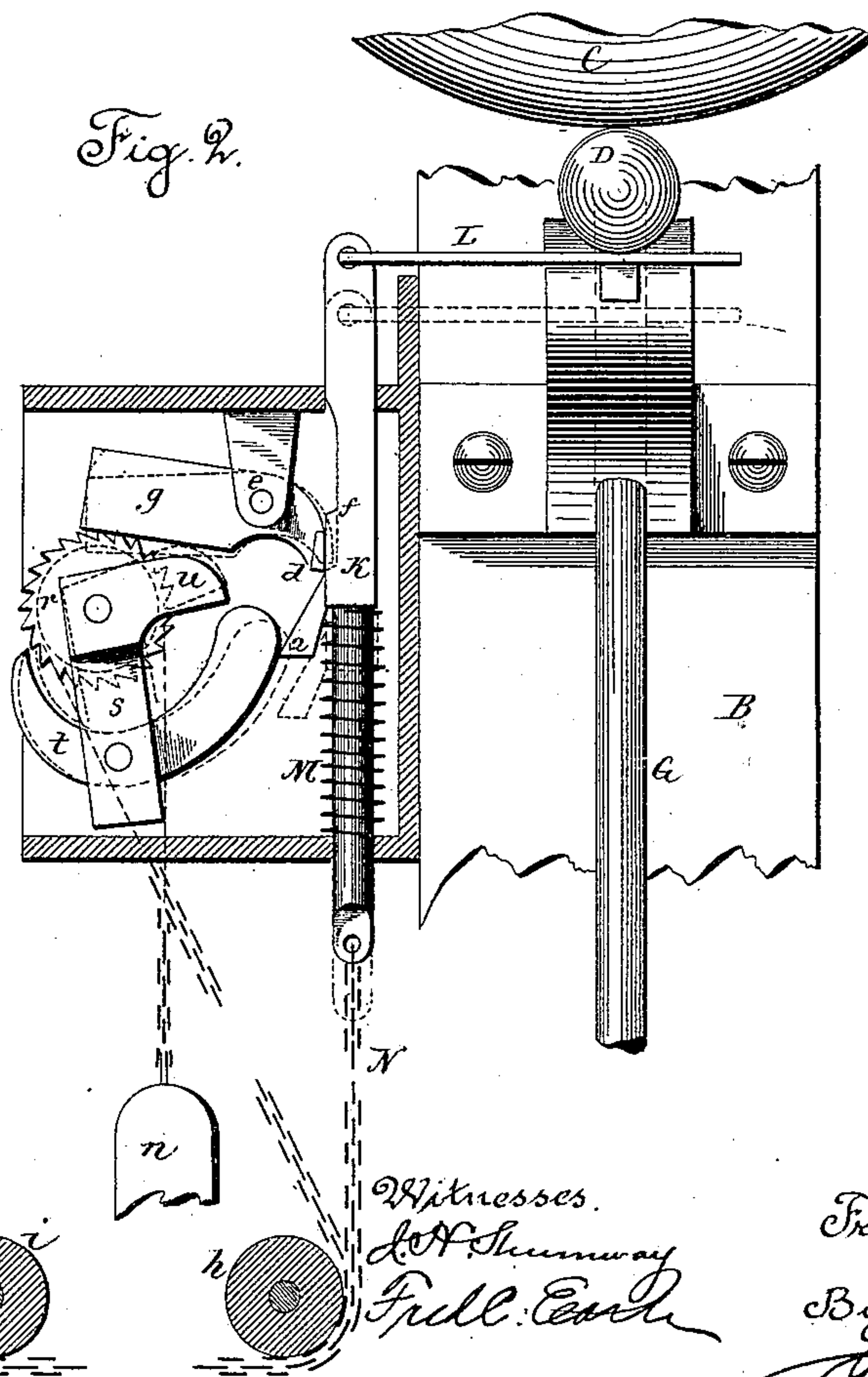
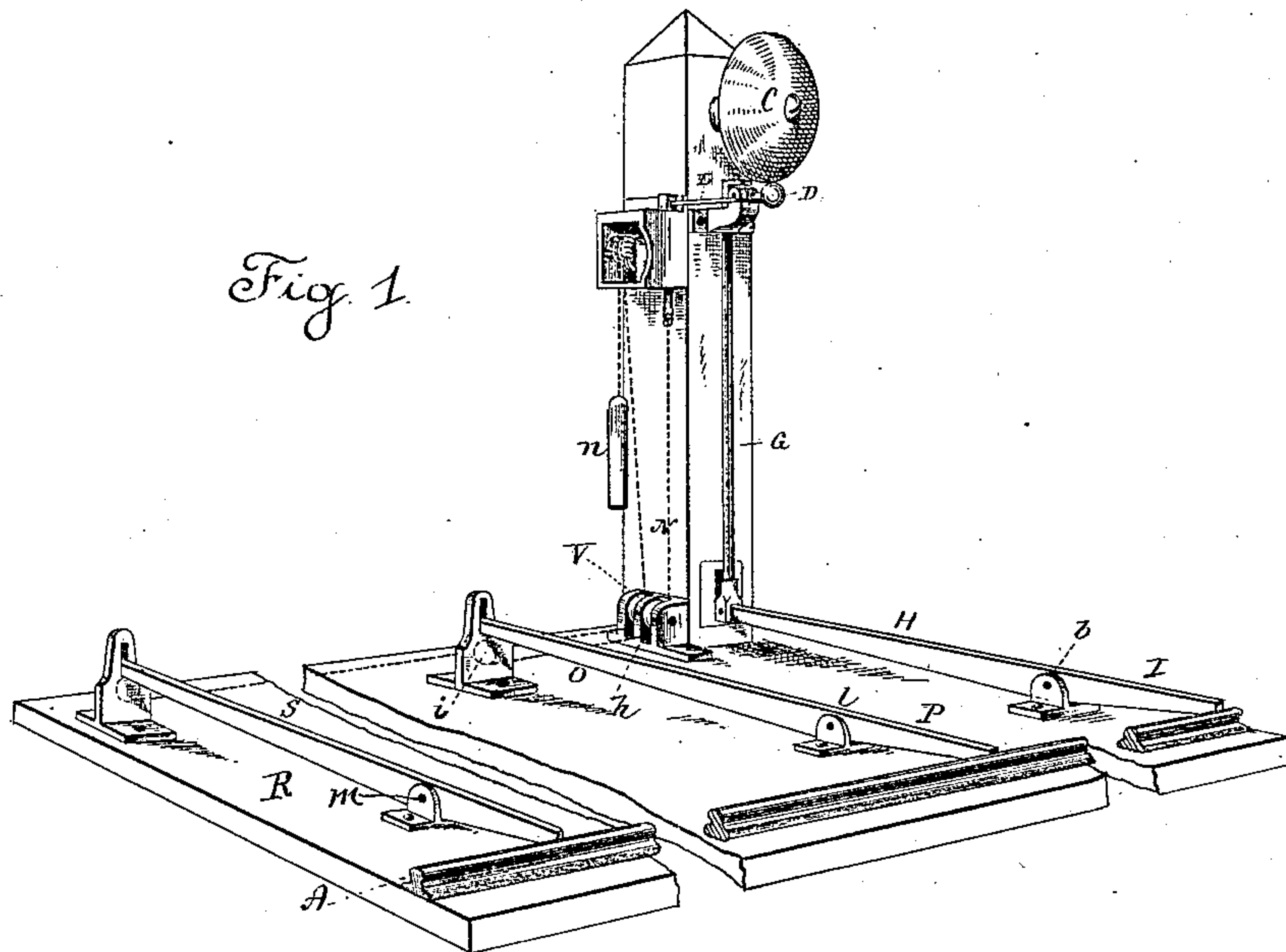
(No Model.)

2 Sheets—Sheet 1.

F. N. KELSEY.
RAILWAY SIGNALING APPARATUS.

No. 337,269.

Patented Mar. 2, 1886.



Frank N. Kelsey,
Inventor.

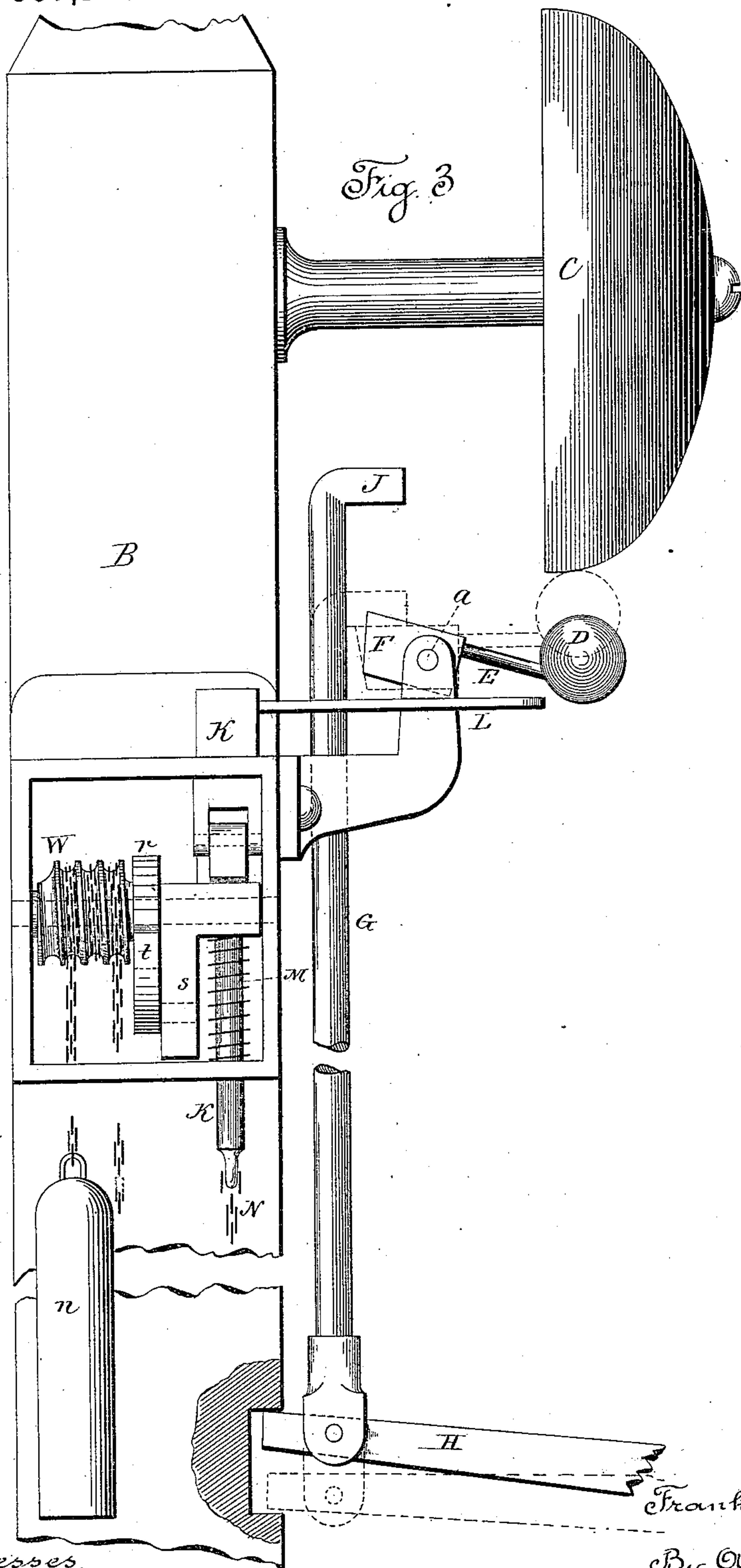
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

FRANK N. KELSEY, OF NEW HAVEN, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO JOHN B. RATHBUN, OF SAME PLACE.

RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 337,269, dated March 2, 1886.

Application filed December 28, 1885. Serial No. 186,861. (No model.)

To all whom it may concern:

Be it known that I, FRANK N. KELSEY, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Railway Signaling Apparatus; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a perspective view of the apparatus, showing one rail of a track with the parts in position for operation; Fig. 2, a partial front view, showing a vertical section through the tripping apparatus, enlarged; Fig. 3, a side view of the parts enlarged.

This invention relates to an improvement in that class of signals for railway purposes which are actuated by passing trains to indicate obstructions, or the condition of the track beyond, and particularly to that class in which such signal is in the form of a gong, but portions of the invention are applicable to other classes of signals, the object of the invention being principally a simple automatic contrivance whereby the gong may be sounded by the wheels of a passing train when obstructions are in advance, but left free when the track is clear, and also to provide a simple mechanical device to automatically take up the expansion, or permit the contraction of the connecting wires or chains between distant points in such apparatus; and it consists in the construction as hereinafter described, and particularly recited in the claims.

In Fig. 1, A represents one rail of a track adjacent to which the signaling apparatus is arranged.

B is a post or other device at a point where the signal is desired to be made; C, the bell or gong fixed at that point, and upon which blows are struck as the signal.

D is the hammer on one arm, E, of a lever hung upon a pivot, *a*, in rear of the bell, the other arm, F, extending in rear of the pivot, as seen in Fig. 3.

G is a rod arranged in vertical guides, and so as to be moved down and up, as from the position seen in Fig. 3 to broken lines, same

figure, and return. At its lower end it is hung or made fast to one arm, H, of a lever, which extends therefrom to a point near the track, intermediately hung upon a fulcrum, *b*, and so that the arm I may so nearly reach the track as to stand in the path of the passing wheels. When free, the weight of the rod and the lever is such that it readily drops, as seen in broken lines, Fig. 3, bringing the outer arm, I, so far above the plane of the track, as seen in Fig. 1, that the wheels of a passing locomotive or of the train may successively strike that arm and depress it, so as to raise the inner arm, H, and the rod G, as seen in Fig. 3, the rod falling between each wheel, so that successive wheels impart an up-and-down reciprocating movement to the rod. The upper end of the rod G is turned outward to form a finger, J, and over the arm F of the hammer-lever, and so that as the rod descends the finger J will strike the inner arm, F, of the hammer-lever and throw the hammer up against the bell. Then as the rod rises the hammer falls, and so continuing each descent of the rod will produce one stroke upon the hammer.

This gong-sounding device or signaling apparatus may be arranged at any point on a railroad where it is especially desirable to call the attention of the engineer to possible obstructions or difficulties ahead, and so that every locomotive which shall pass on that track will sound the gong—as, for instance, crossings—or wherever signals are necessary for the engineer, and at points where signals are usually arranged for him to observe, as by colors or otherwise, and which signals are liable to be obscured by fog, this signal being in such case a substitute for the well-known permanent signals.

In the use of this signal to indicate whether or not the track ahead is in condition for a train to pass on, the signal should be arranged so that it may be sounded only when there is danger or obstruction ahead. To do this I provide a means for throwing the hammer out of the path of the finger on the rod G, and this I do by means of a vertical slide, K, arranged on the post or at a convenient point, and which carries an arm, L, extending outward beneath the hammer. The slide K is provided with a spring, M, the tendency of which is to lift the

slide K, as seen in full lines, Fig. 2, and in which upward movement of the slide K the arm L raises the hammer, as indicated in broken lines, Fig. 3, so far out of the way of the path of the finger J on the rod G that as the rod descends it will have no effect upon the hammer, notwithstanding the fact that every passing train will actuate the rod G. Near the slide K a dog, *d*, is hung upon a pivot, *e*, its nose adapted to engage a shoulder, *f*, on the slide K when the slide is in its down position, and so as to hold the slide K down and leave the hammer free, as indicated in broken lines, Fig. 2. The dog *d* extends to the opposite side of the pivot, where it forms a weighted arm, *g*. From the slide K a chain or cord, N, extends down around a pulley, *h*, and to a distance in advance of the lever H, where, passing beneath another pulley, *i*, it extends up and is attached to the end of an arm, O, of a lever which extends toward the track and is hung upon a fulcrum, *l*, the other arm, P, extending to the track, and so that when that arm is in its up position it may be in the path of the wheels passing on the track.

Suppose the slide K to be in its up position, disengaged from the dog, as seen in Fig. 2, and so as to hold the hammer out of the path of the rod G, and in which condition the arm O of the second lever is depressed, as seen in Figs. 1 and 2, the arm P next the track raised, as seen in Fig. 1, an advancing train passing the first lever, H I, and coming to the second lever, will depress the arm P and raise the arm O, as indicated in broken lines, Fig. 2, which movement of the second lever will draw down the slide K, so that the dog *d* may engage the shoulder *f*, as seen in broken lines, Fig. 2, and take the arm L away from the hammer, and so as to leave the hammer free for the action of the wheels of the next passing train or locomotive, and so long as the slide K stands in this down and locked condition the hammer will be in condition to sound the bell and give the signal. This second lever should be arranged so far in advance of the signal or bell as to give the next approaching train an opportunity to stop before the second lever is reached. The engineer, hearing the bell, knows that danger is ahead beyond the second lever.

To automatically disconnect this danger-signal when the advance train, or whatever the obstruction may be, is removed, I arrange a third lever, like the first and second, hung upon a fulcrum, *m*, one arm, R, extending toward the track, and the other arm, S, extending away from the track. From the end of the arm S a chain, T, passes around a pulley, U, thence to a pulley, V, at the post or signal-station, thence up and around a spirally grooved drum, W, the spiral groove preferably several times around the drum and the chain or cord continued through the groove, so as to make several turns around the drum. To the other end of the chain a weight, *n*, or its equivalent, is applied. This weight tends to rotate the drum until the chain, rod, or

whatever it may be, throughout its length is drawn taut; but when the arm S of that third lever is raised it will draw upon the chain or rod, and in so doing will impart corresponding rotation to the drum W and correspondingly raise the weight *n*; but when the lever is free the weight will draw upon the chain or rod and re-turn the drum W. On the shaft of the drum W a lever, *s*, is hung, and so as to swing free and independent of the drum. On this lever *s* a pawl, *t*, is hung, adapted to engage the teeth of the ratchet *r*. The pawl is weighted or constructed in any of the usual methods, so as to escape the teeth of the ratchet or engage therewith, as the case may be. From the hub of the lever *s* an arm, *u*, extends beneath the arm *g* of the pawl *d*, and so that as the lever S is turned, as indicated in broken lines, Fig. 2, it will act as a cam upon the arm *g* of the pawl and turn it upward, as indicated in Fig. 2.

Suppose the wheel of the locomotive to strike the lever R S, and so as to raise its inner end, as indicated in broken lines, Fig. 2, it will draw upon the chain and impart rotation to the drum W and the ratchet *r*, which rotation will be imparted to the lever S, through the pawl *t*, and cause the arm *u* to rise and turn the dog *d* from its engagement with the slide K, and so as to permit that slide to rise, as before described, and disconnect the signaling apparatus, the lever S R at once returning to its normal position, and so that the next approaching train, coming to the signal and hearing no sound or indication therefrom, will know that the track is clear from that point to the point where the lever R S is arranged. As this detaching-point is necessarily at a very considerable distance from the signal-station, the expansion or contraction of the rod or chain will be very considerable. As the chain or rod expands, the weight *n* will take up whatever expansion there may be, the drum around which the chain is wound revolving in such expansion, the teeth of the ratchet escaping the pawl, so as to attain the same relation to the pawl and cam, irrespective of the extent of expansion. This would provide for the take-up of any expansion of the rod; but to provide for the contraction of the rod or chains it is necessary that the pawl *t* be thrown out of engagement with the ratchet when in its normal condition, and so as to leave the drum free to revolve. To thus throw the pawl out, the slide K is constructed with a projection, 2, which, when the slide is in its up or normal position, will bear against the tail of the pawl and throw it out of engagement with the ratchet, thus leaving the ratchet free to turn in either direction independent of the pawl, and then, as the rod or chains contract, the weight will be raised and the drum rotated accordingly, but without effect upon the pawl. So soon, however, as the slide is dropped to permit the action of the hammer, as indicated in broken lines, Fig. 2, then the pawl is free to engage the ratchet. The time in which the pawl will be thus en-

gaged will always be so short as not to materially interfere with any expansion or contraction of the rod or chains which might take place.

5 This device for automatically accommodating the expansion and contraction of the rod or chain may be applied in most of the signaling apparatus used upon railroads, it only being necessary to apply the drum and the
10 chain to the apparatus. Such application will readily suggest itself to those skilled in the use of such signaling apparatus without particular illustration or description.

15 From this description it will be seen that the signaling apparatus is adapted to use as a bridge, switch, crossing, station, or block signal.

20 The levers may be arranged with such relation to the track that only the drivers of the locomotive will operate upon them, or either of them, where it may be desirable that the signal shall be only sufficiently long for the engineer to observe it. The tire of the driving-wheels being broader than that of the outer
25 wheels, if the end of the levers be only brought to a position for the drivers to reach, then the other wheels will escape.

30 The dog which engages the slide K to hold it away from the hammer may be tripped by hand or any suitable mechanism, the automatic disengagement not being essential to this part of my invention.

35 In using the term "chain" or "rod" as the connection with distant points, I wish to be understood as including any of the usual appliances for making such connections.

40 I am aware that a lever has been arranged adjacent to one of the rails of a railway-track, one arm in the path of the wheels passing on the track and the other arm adapted to actuate a bell, and therefore do not claim, broadly, such a railroad-signal, the essential feature of my invention being a projection on the rod
45 which extends up from the lever, the said projection above a corresponding projection from the hammer, the said hammer-projection standing in the path of the said projection on the rod as the rod descends, and whereby the descent of the rod striking the said extension
50 from the hammer will bring the hammer into contact with the bell.

I claim—

55 1. The herein-described railroad-signal, consisting in the combination of a lever, H I, extending from one rail of the track, one arm in the path of wheels passing on the track, the vertical rod G, hung to the other arm of said lever, a fixed bell, and a hammer hung between said rod and bell, the rod constructed

with a projection and the hammer with a corresponding extension which shall stand in the path of said projection, whereby, as the rod descends, the hammer will be brought into contact with the bell, substantially as described. 60 65

2. The combination of the two levers H I and O P, extending from the railway-track, one arm being in the path of wheels passing on the track, the rod G, fixed bell C, hammer D, hung between said rod and bell; the slide K, connected to one arm of said lever O, the said slide provided with an extension arranged to take said hammer out of the path or action of said rod G, and a dog arranged to hold said slide away from said hammer, substantially as described. 70 75

3. In a railway signaling apparatus, the combination of a drum with mechanism between said drum and the signaling device, whereby said signaling device may be disengaged, a chain or cord wound about said drum, so as to be in frictional contact therewith, one end of said chain provided with a counter-balance tending to turn the drum in one direction, the other end of the chain extending to a distant point, and a lever at such distant point, the said chain connected to one arm of said lever, the other arm adjacent to the track over which wheels will pass, substantially as described, and whereby the said counter-balance will take up the expansion or permit contraction of the connection between it and the said lever. 80 85 90

4. In a signaling apparatus, the combination of the vertical slide K, its lever O P, adapted to impart vertical movement to said slide, said slide adapted to bring the signaling apparatus into action or take it therefrom, as the case may be, a dog arranged to engage said slide and hold it in the inactive position, a shaft with the ratchet r thereon, a lever, s, hung on said shaft adjacent to said ratchet, a pawl, t, on said lever, arranged to engage the teeth of said ratchet, said lever constructed with an arm, u, arranged to operate upon said dog, a drum on said shaft, a chain wound about said drum, one end provided with a counter-balance and the other extending to a distant point, and a lever at that point in connection with that end of the chain, one arm of said lever arranged in the path of wheels passing on the track, substantially as and for the purpose described. 95 100 105 110

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