

(No Model.)

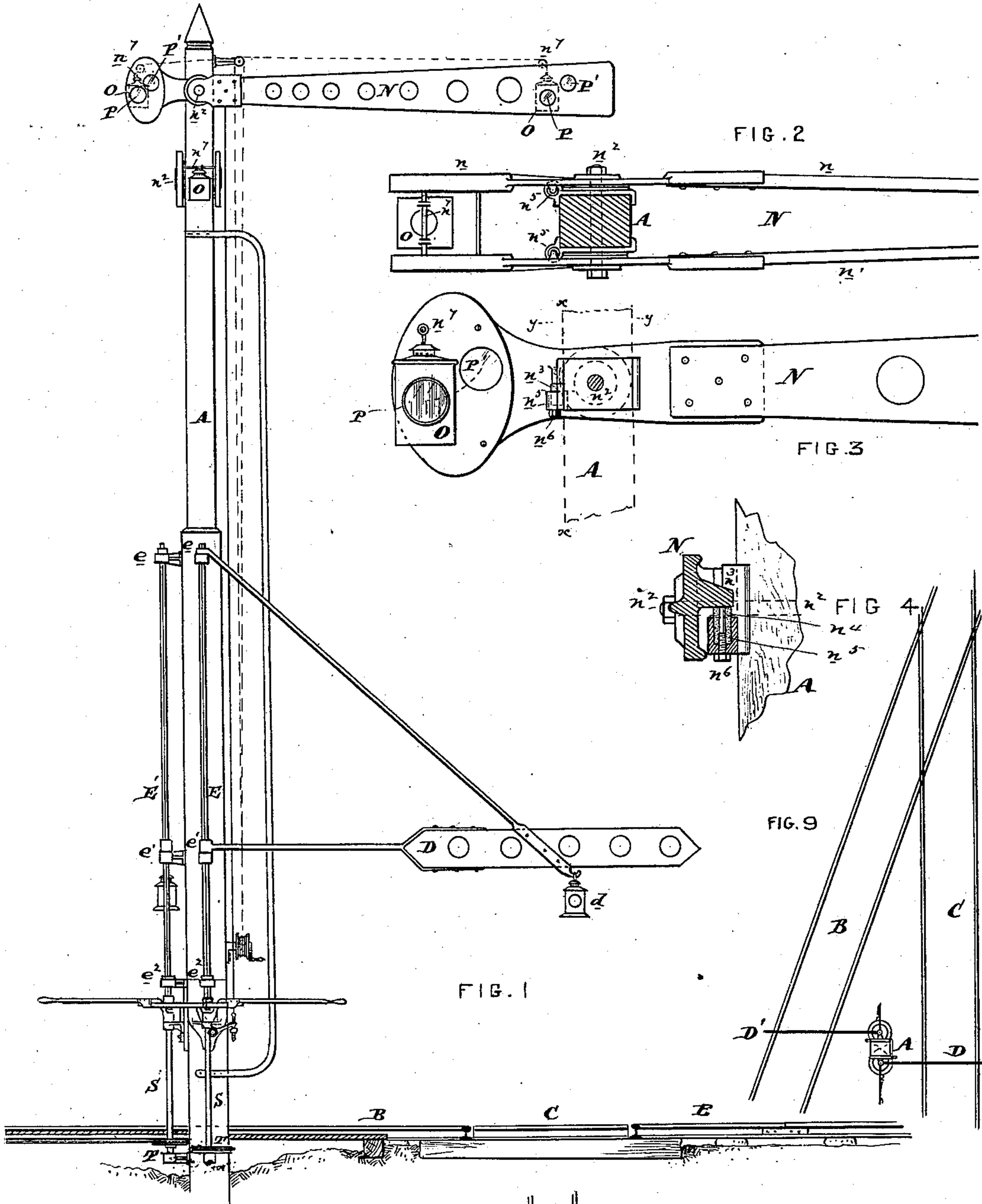
2 Sheets—Sheet 1.

J. McCREA.

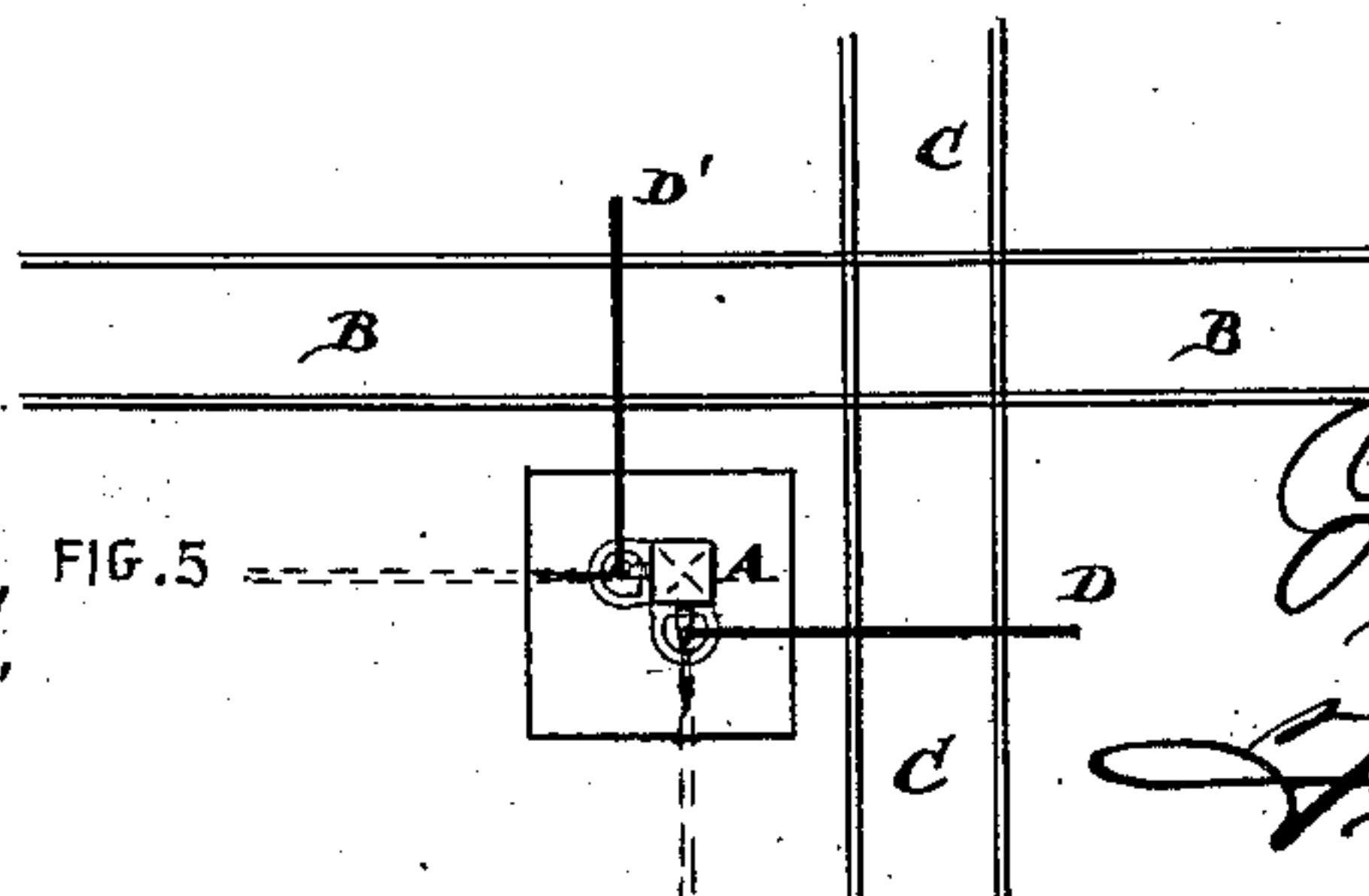
SIGNAL FOR RAILWAY CROSSINGS.

No. 351,456.

Patented Oct. 26, 1886.



Attest
G. F. Harding
Joshua M. Hackett



Inventor.

James M. Crea
by his attorney
Francis T. Chambers

(No Model.)

2 Sheets—Sheet 2.

J. McCREA.

SIGNAL FOR RAILWAY CROSSINGS.

No. 351,456.

Patented Oct. 26, 1886.

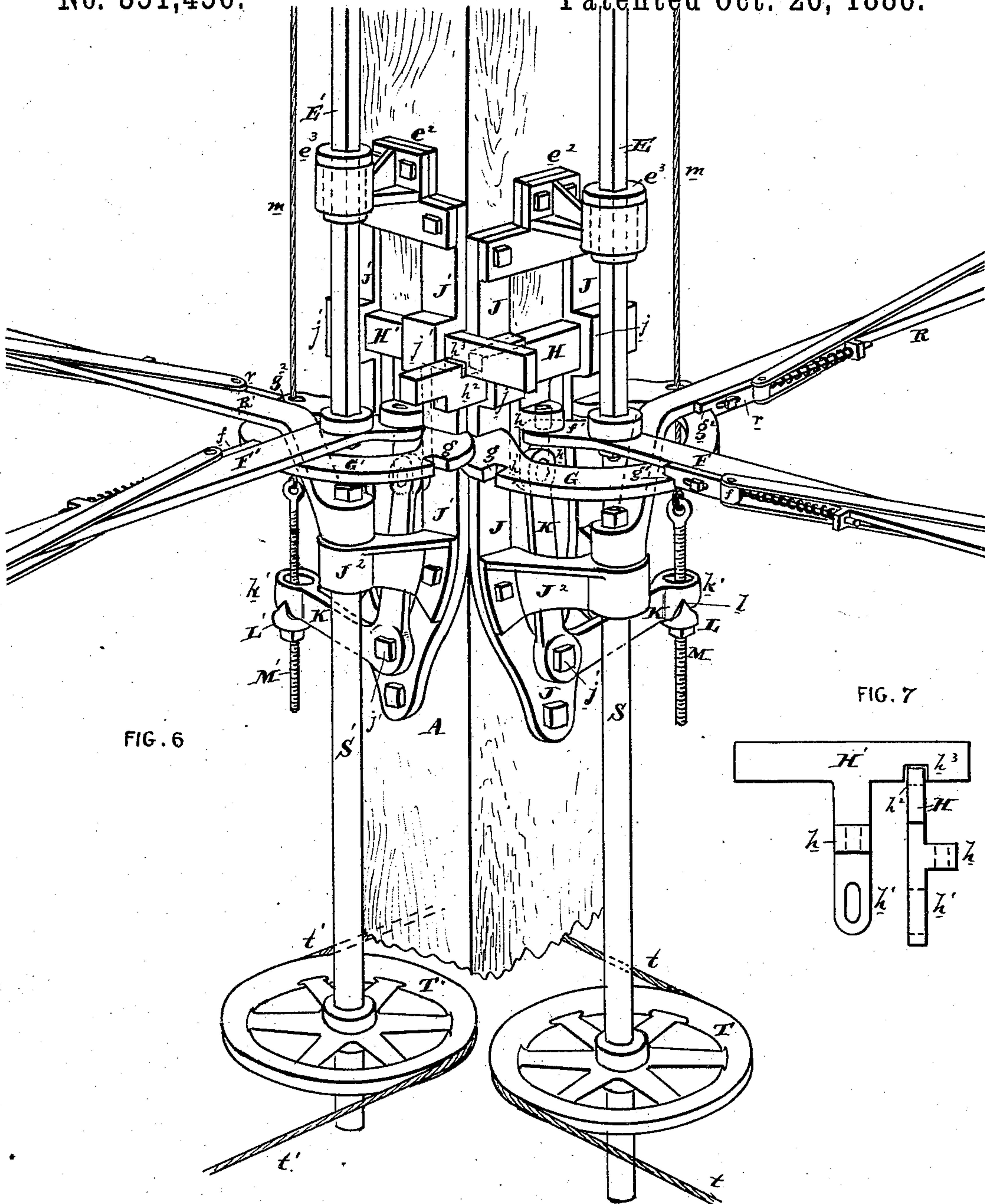


FIG. 6

FIG. 7

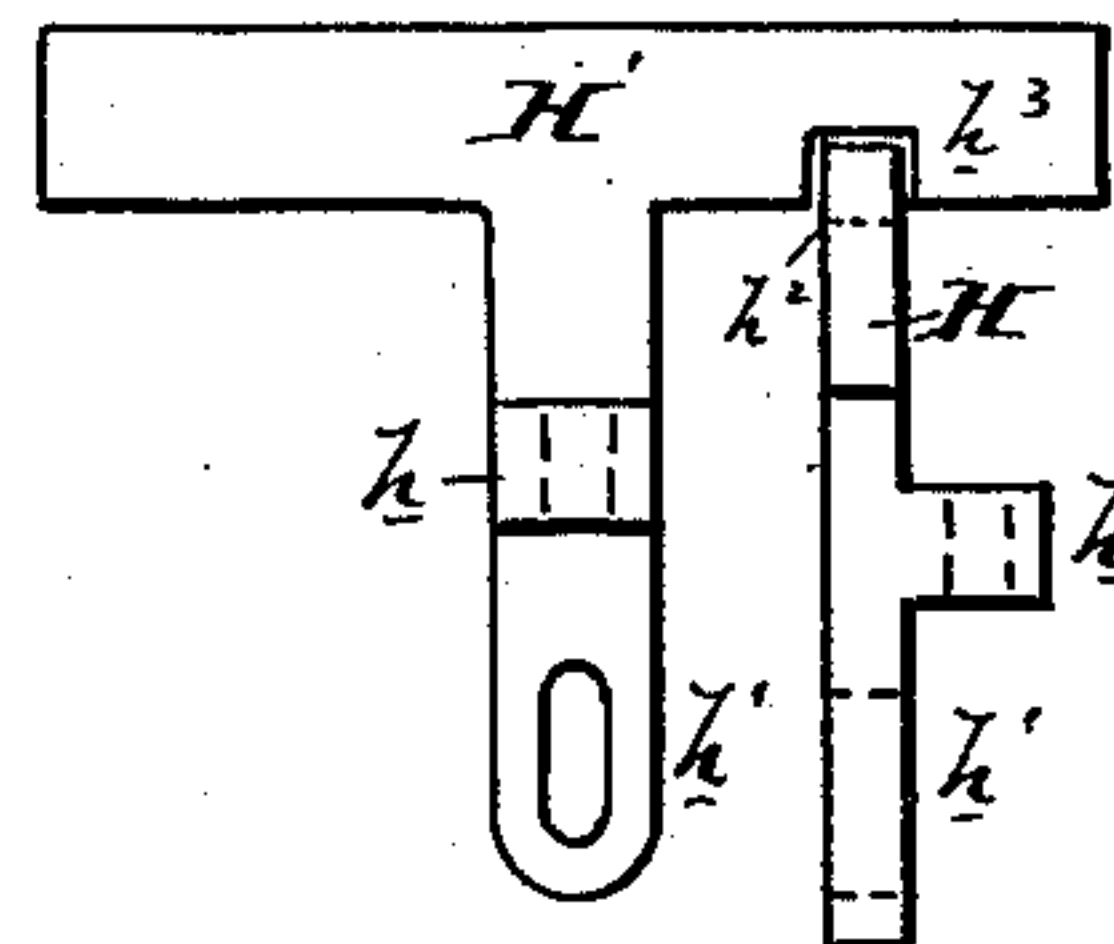
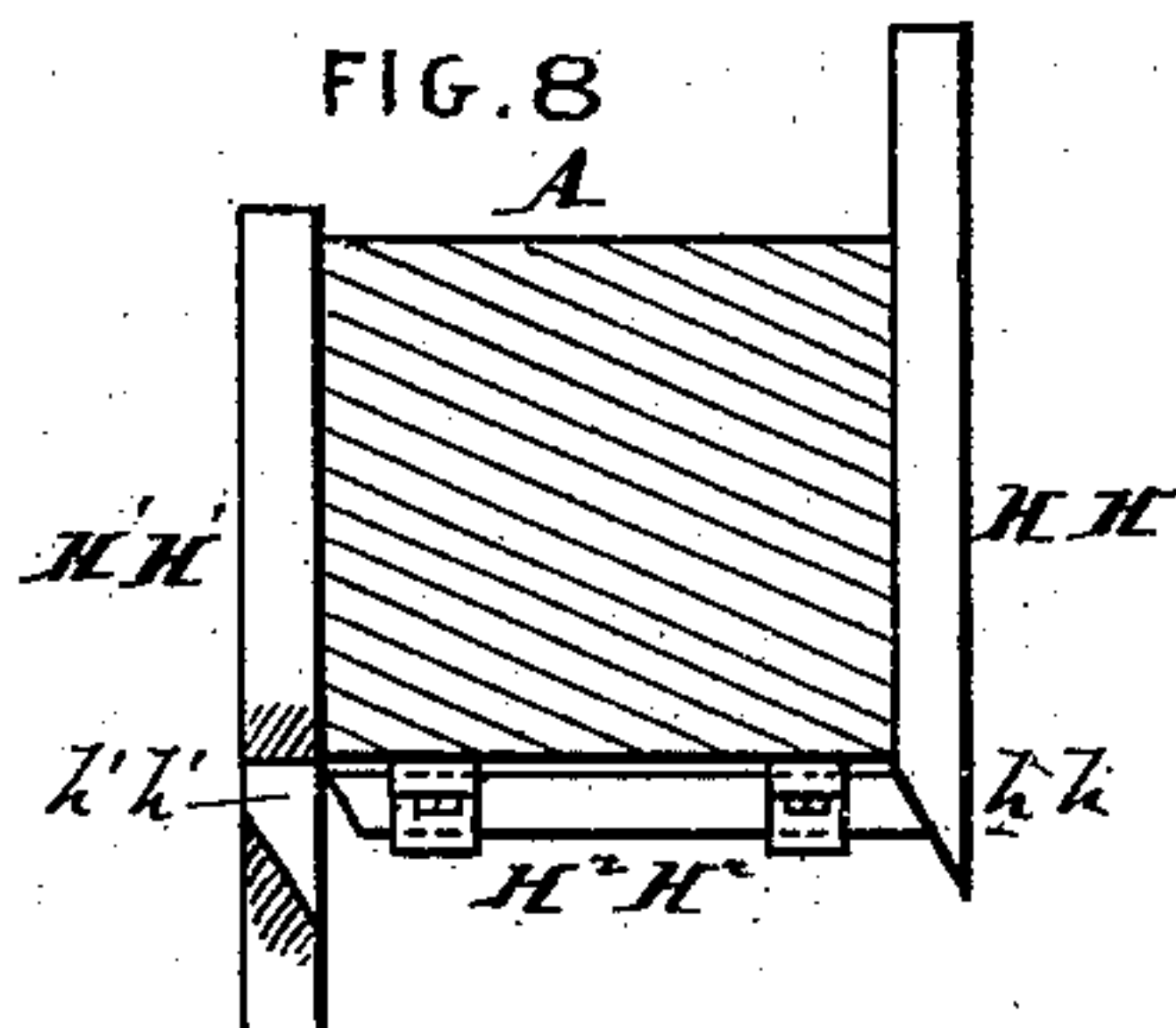


FIG. 8



Attest
G. J. Harding
Joshua M. Mack Jr.

Inventor
James M. Crea
by his attorney
Francis T. Chambers

UNITED STATES PATENT OFFICE.

JAMES MCCREA, OF ALLEGHENY CITY, PENNSYLVANIA.

SIGNAL FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 351,456, dated October 26, 1886.

Application filed April 10, 1886. Serial No. 198,423. (No model.)

To all whom it may concern:

Be it known that I, JAMES MCCREA, a citizen of the United States, residing at Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Signals for Railway-Crossings and other Purposes, of which the following is a full and true description, reference being had to the accompanying drawings, which form a part of this specification.

My invention is especially adapted for use at the intersection of two lines of railway, where it is essential that whenever the signal "safety" is given to one line of road the signal "danger" should remain set for the intersecting line, although in many of its features it is adapted for use at other points, my object being to securely interlock the signal-actuating devices relating to the crossing tracks with each other, so that whenever the one signal shows "safety" the other is locked to "danger;" to interlock the levers actuating the point and distance signals relating to one route in such manner that the distance-signal must necessarily be set to "safety" after the point-signal, and to "danger" before the point-signal; to cause the swinging bar or gate which crosses the track to move in perfect accord with the semaphore-signal relating to the same track; to insure a positive and secure connection between the semaphores and their actuating-levers; to so combine a lantern or lanterns with the semaphore-arms that they will exhibit a white light when in a position indicating "safety," and a red light when they rise to "danger;" to secure the operative mechanism of the signals, locks, &c., in such manner that they will retain their proper relative positions without change, and, generally, to perfect and improve the operative parts of the signal system, reference being had to the drawings, which illustrate crossing-signals having my improvements, and constructed in accordance with my invention, and in which—

Figure 1 is an elevation at the point of intersection of two tracks crossing each other at right angles, or nearly so; Fig. 2, a plan view of my improved semaphore-arm; Fig. 3, a side elevation of the same; Fig. 4, a detailed sectional view of the rest, against which the semaphore-arm rests when at "danger;" Fig. 5, a plan view showing the position of the signal-

point at the intersection of two tracks crossing at right angles; Fig. 6, an isometric drawing of the lower part of the signal-post and of the mechanism for actuating the signals thereon supported; Fig. 7, an elevation of the device for interlocking the signals; Fig. 8, a modified construction of the lock, adapted for use where the intersecting tracks run nearly parallel, or as shown in Fig. 9, which is a plan of tracks crossing each other at an acute angle, and shows the arrangement of the signal-post and gates therewith.

A is the post to which the semaphore-arms and the actuating mechanism are attached. I prefer to make it four-sided and place it so that one of its sides shall be parallel, or nearly so, to each of the intersecting tracks B B and C C.

D and D' are the swinging gates or arms, which extend across the track to indicate danger and swing back when the route is open. These gates are secured to a shaft, E, which turns in journals $e e' e^2$, secured to the post A. I prefer to make the shaft E or E' of square section, providing it with cylindrical bushings e^3 (see Fig. 6) where it passes through the journal-brackets $e e' e^2$.

To the lower end of the shaft E is secured a lever, F, having a spring-pawl, f , of usual construction, adapted to enter notches $g g'$ in an annular casting, G, which is firmly secured to the post A. The lever F has a short arm, f' , extending beyond its pivotal point toward the post, which is connected with a lug, h , of a sliding bolt, H, by means of a slot and pin, as shown. This sliding bolt H is secured to the post by straps $j j$ or other devices, which permit it to move freely in a horizontal direction, but prevent any vertical movement. Besides the lug h , by which it is connected with the actuating-lever F, the bolt H has another lug, h' , extending downward and at right angles to the lug h , and to this lug is connected, by means of a pin and slot, a bell-crank lever, K, which is pivoted to the post, or rather to the frame J, which, as shown in Fig. 6, is bolted to the post and sustains the bearings and frame-work, which in turn sustain the main parts of the operative mechanism. By this device the relative position of the connected parts is properly maintained.

The end k' of the lower arm of the lever K.

is made into a ring, as shown, or forked, if preferred, and provided on its under side with a notch, in which rests the knife-edge l of a nut, L , which meshes with a screw-threaded rod, M , forming the termination of the operating-cord m , which moves the semaphore-arm.

N is the semaphore, which, for reasons hereinafter explained, I prefer to make double, as shown in Fig. 2, two similar arms, n n' , being securely fastened together so as to leave an open space between them. The semaphore-arms are pivoted to the post A at n^2 , and each side has an inwardly-projecting lug, n^3 , which serves as a stop, resting when the arm is horizontal against a rubber cushion, n^4 , inserted in a thimble, n^5 , secured to the post.

To prevent the rubber cushion from escaping from its thimble, I perforate it centrally, as shown, and perforate also the bottom of the thimble n^5 and insert a screw, n^6 , therein, which engages with the cushion and holds it securely in the thimble.

At the extremities of the semaphore-arms N , and between the sides, n and n' , I hang a lantern, O , which is suspended from a center, n^7 , so that its light will come directly between openings P in the arms n and n' when the semaphore-arm is in the horizontal position indicating danger. These openings P are of course provided with red glass, so that they will show the red signal-lights at night. At the same distance from the center n^7 and in front of them, I provide openings P' in the arms n and n' , so placed that the lantern will swing in front of them when the semaphore falls to the position indicating safety, which should be in a line forty-five degrees from the horizontal. The openings P' may be unglazed or covered with plain glass, so as to show a white light.

The foregoing description relates to the signals governing one of the intersecting tracks, the signals relating to the other being in all respects similar, and secured to the post A in the same manner, (see Fig. 6,) the two signals being interlocked in the simple way indicated in this figure or in Fig. 8. Referring first to Fig. 6, which shows the actuating-levers, &c., arranged on adjacent sides of the post, as they would naturally be where the tracks cross each other at right angles, as shown in Fig. 5, it will be seen that the sliding bolts H and H' project beyond the side of the post A toward and across each other, the one, H' , being higher than the other, H , but not enough higher for its lower edge to pass over the upper edge of H . At the point where the two bolts intersect when the signals actuated by them are in their normal danger position, square notches h^3 and h^2 are cut in the lower edge of the upper bolt and the upper edge of the lower bolt, each being in breadth a little greater than the thickness of the bolt, and in depth a little deeper than the distance of the overlap of the two bolts. (See Fig. 7.) It will be evident at a glance that when the bolts are in their normal position, as shown in Fig. 6, either may be moved, and that in moving the edge of the moving bolt will

pass into the slot of the stationary bolt and effectively lock it to "danger," it being impossible to move it until both are again in their normal position. When the sliding bolts are on opposite sides of the post A , as is convenient when the tracks run as shown in Fig. 9, they may be made to interlock, as shown in Fig. 8, where the bolts H H and H' H' are substantially parallel. A third sliding bolt, H^2 H^2 , a little longer than the width of the side of the post A to which it is secured, is provided and placed so that it will intersect the bolts H H and H' H' . Its ends are beveled, as shown, and the bolts H H and H' H' have similar bevels, either at their ends h h or in slots h' h' , against which the beveled ends of the bolt H^2 H^2 rest when pushed out at either side of the post. As shown in Fig. 8, the bolts are in their normal position, and either may be moved, and it is clearly apparent that the movement of one will lock the other to "danger" in the same way as shown in Figs. 6 and 7.

To the framing J , by means of a strong supporting-bracket, J^2 , is secured the upper end of a shaft, S , situated below the shaft E and with its axis preferably in the same line. To the top of this shaft is secured a bent lever, R , which rises from the head of the shaft S until it passes through the annular rim G and then turns outwardly to a practically horizontal position. To this lever is secured a spring-pawl, r , like the pawl f of the lever F , and placed and adapted like it to engage with the slots g' g' of the rim G . Near the bottom of the shafts S and S' are secured grooved wheels T and T' , from which run the actuating-lines t t and t' t' which move the distance-signal. By the described arrangement of the levers R and F an interlocking of the point and distance signals is effected, for, as will be at once seen, the lever R cannot be moved to or secured in the notch g' which it occupies when the distance-signal shows "safety" until the lever F , which occupies this notch when the semaphore is at "danger," is moved to the notch g , thereby showing safety at the point.

The operation of my devices may be readily understood from the above description. As shown in the drawings, all signals are in their normal or danger position. Then, when it is desired to open one of the intersecting tracks the operator takes hold of a lever, F , and withdrawing the pawl f from the notch g' , moves it through an angle of ninety degrees until the pawl engages with the notch g . The shaft E of course turns through an equal angle and the gate D turns with it until it lies parallel with the track. The bolt H is, through its lug h moved along by the short bent arm f' of the lever F , and at the beginning of its movement locks the bolt H' in its normal position and through it all the signals relating to the intersecting tracks. By means of its lug h' the bolt H in moving operates the bell-crank lever K , which in turn, by means of the cord m , pulls the semaphore-arm down to a po-

sition indicating "safety," the cord *m* being kept taut by means of the knife-edged nut *L* working on the threaded rod *M*. When the semaphore falls to its safety position, the openings *P* swing away from the lanterns *O*, and the openings *P'* come in front of them, thereby automatically changing the red danger-signal for the white safety-signal, as well as showing the angular line of the semaphore. All this is accomplished by the movement of the lever *F*, and as soon as it is secured in the notch *g* the lever *R* is moved along through ninety degrees and locked in the notch *g'*. This sets the distance-signals to "safety" and the route is clear. In closing the route the distance-signals must first be operated by moving the lever *R* back to the notch *g'*, and then the lever *F* is moved into the notch *g*.

Many parts of my above-described device are capable of useful separate as well as conjoint use, and the different elements may also be varied in position and arrangement, those described by me being, I believe, the best and most practicable.

In order to illustrate my invention clearly, I have in Figs. 6 and 7 found it necessary to depict some of the operative parts in a somewhat exaggerated proportion. Especially is this true of the lugs *h'* and *h'* of the sliding bolts *H*, the first of which should in practice project directly from the bolt *H*, instead of from the lug *h'*, as shown, while the lug *h'* is shown as of greater length than is at all necessary in practice.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a signal-post, of two signals, a sliding bolt for each, said bolts being each out of locking engagement with the other only when the signals are both in the normal or danger position, operating-levers pivotally connected with the bolts, and signal-actuating mechanism connected with the bolts, substantially as and for the purposes specified.

2. The combination, on a signal-post, of two sets of signal-actuating devices, each consisting of a lever, *F*, arranged to operate a swinging gate and a sliding bolt, substantially as described, a bell-crank lever arranged to actuate a signal and having one of its arms connected with the sliding bolt, the sliding bolts of each set being interlocked with each other, substantially as specified, so that any movement of one from the normal danger position locks the other and its actuating-lever to "danger."

3. In combination with a signal-post having an annular rim, *G*, secured thereon, a lever, *F*, having a catch, *f*, adapted to engage with notches *g g'* in the rim, and arranged to operate a point-signal, and a bent lever, *R*, provided with a catch, *r*, and passing through the annular rim to the head of the distance-signal shaft situated below the fulcrum of the lever

F, substantially as and for the purpose specified.

4. In combination with a signal-post having notched annular rims *G G'*, the interlocked sliding bolts *H H'*, each connected with a signal upon the post, the actuating-levers *F F'*, adapted to move the bolts and through them their connected signals, and the bent levers *R R'*, passing through the rims *G G'*, respectively, and arranged to actuate the distance-signals, substantially as and for the purpose specified.

5. In combination with a signal-post having notched annular rims *G G'*, the interlocked sliding bolts *H H'*, each connected with a signal upon the post, the actuating-levers *F F'*, adapted to move the bolts and through them their connected signals, and at the same time to operate the swinging gates *D D'*, and the bent levers *R R'*, passing through the rims *G G'*, respectively, and arranged to actuate the distance-signals, substantially as and for the purpose specified.

6. In combination with a bent lever, *K*, and mechanism for operating the same, the threaded rod *M*, connected to the signal-cord *m*, and the nut *L*, having knife-edge *l*, substantially as and for the purpose specified.

7. The combination, with the signal-post *A*, of the semaphore-signal consisting of double arms *n n'*, hinged at *n²* to the post, a swinging lantern, *o*, suspended between said arms, and red and plain lights *P P'*, arranged in the arc of a circle of which the lantern-support is the center, so that the lantern will be opposite the red lights when the signal indicates "danger," and opposite the plain lights *P'* when the signal indicates "safety," substantially as specified.

8. The double semaphore-arm *N*, having two or more sets of openings, *P P'*, each arranged with respect to the point *n'*, from which its lantern is suspended, substantially as specified, so that the lanterns will be opposite the red lights *P P* when the signal indicates "danger," and opposite the plain lights *P' P'* when the signal assumes the angular position indicating "safety," and whereby the position of the signal-arm is indicated by the plane in which the lights appear, substantially as specified.

9. In combination with a signal-post and a semaphore-arm having a lug, *n³*, a stop consisting of a perforated rubber cushion, *n⁴*, perforated thimble *n⁵*, and retaining-screw *n⁶*, all substantially as and for the purpose specified.

10. In combination with a signal-post and signal-actuating and interlocking devices, substantially as described, the iron frame *J*, forming and sustaining the bearings of the interdependent actuating elements, as and for the purpose specified.

JAMES MCCREA.

Witnesses:

S. C. SCOTT,
E. M. NORTON.