

(No Model.)

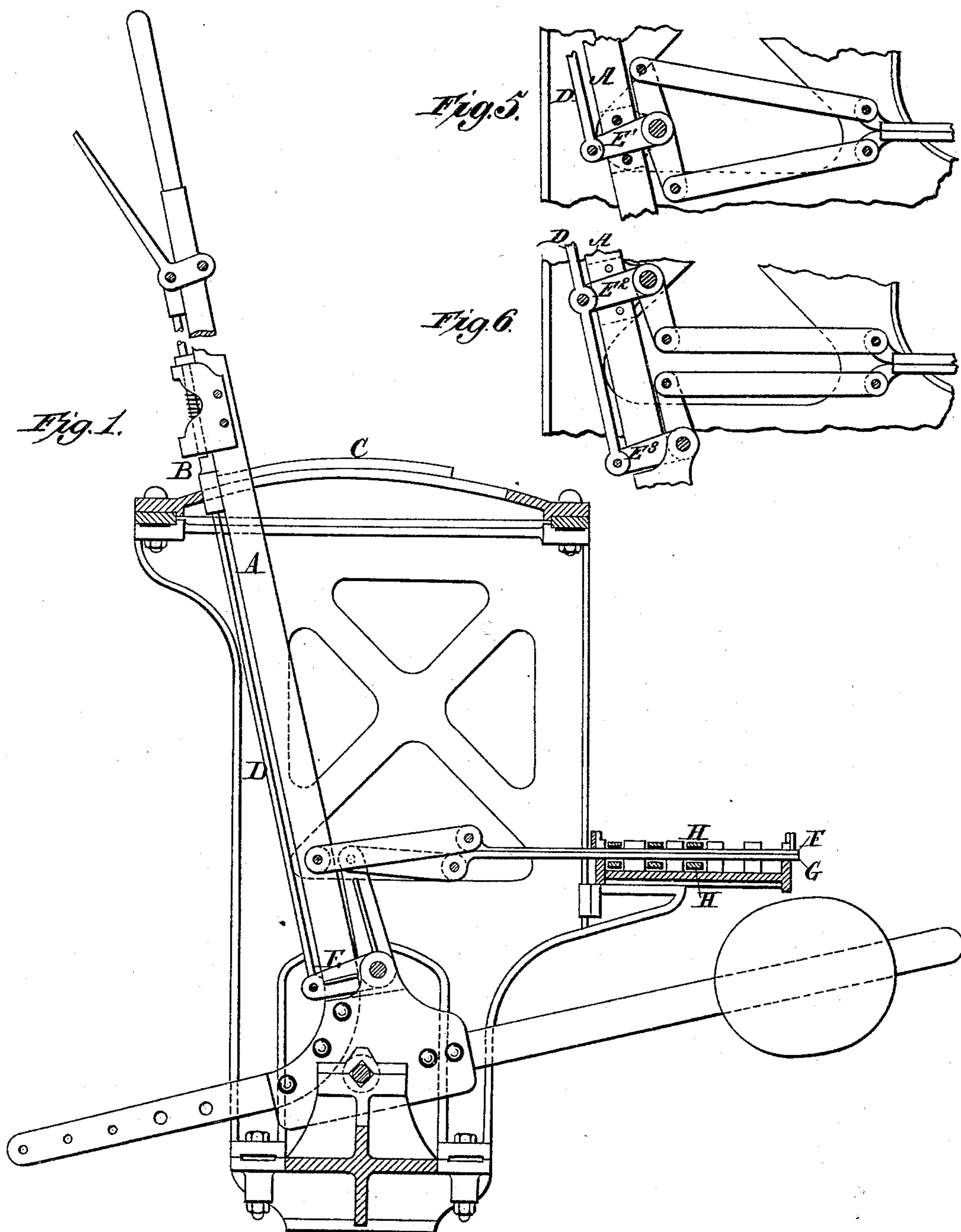
2 Sheets—Sheet 1.

H. REID.

SWITCH AND SIGNAL INTERLOCKING APPARATUS.

No. 395,588.

Patented Jan. 1, 1889.



Witnesses:
Geo. W. Rea.
Robert G. Pratt,

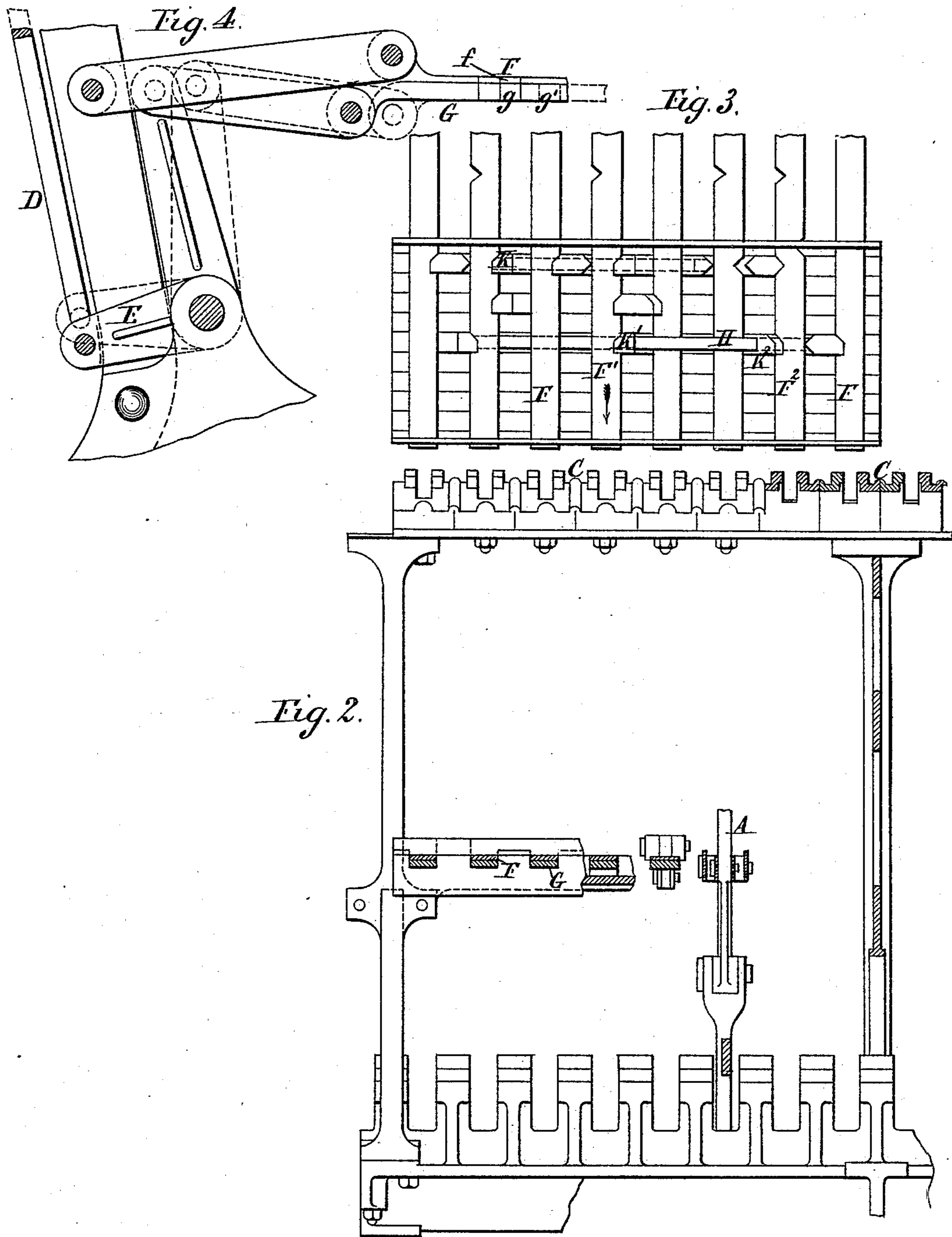
Inventor,
Hugh Reid.
By
James L. Norris,
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UNITED STATES PATENT OFFICE.

HUGH REID, OF DERBY, COUNTY OF DERBY, ENGLAND.

SWITCH AND SIGNAL INTERLOCKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 395,588, dated January 1, 1889.

Application filed May 23, 1888. Serial No. 274,858. (No model.) Patented in England January 5, 1888, No. 183; in France May 2, 1888, No. 190,374; in Belgium May 2, 1888, No. 81,665; in Victoria June 8, 1888, No. 5,884; in New South Wales June 12, 1888, No. 718; in Italy July 3, 1888, XLIV, 265; in India July 11 and August 14, 1888, No. 117/110; in Canada August 4, 1888, No. 29,638, and in Spain August 20, 1888, No. 8,264.

To all whom it may concern:

Be it known that I, HUGH REID, a citizen of England, residing at Derby, in the county of Derby, England, signal-fitter, have invented
5 new and useful Improvements in Interlocking Apparatus for Railway Point and Signal Levers, (for which I have obtained patents in France, dated May 2, 1888, No. 190,374; Belgium, dated May 2, 1888, No. 81,665; Italy,
10 dated July 3, 1888, Vol. XLIV, 265; Victoria, dated June 8, 1888, No. 5,884; New South Wales, dated June 12, 1888, No. 718; India, dated July 11 and August 14, 1888, No. 117/110; Canada, dated August 4, 1888, No. 29,638;
15 Spain, dated August 20, 1888, No. 8,264, and have made application for patent in Great Britain, which patent when granted will bear date January 5, 1888, No. 183,) of which the following is a specification.
20 In many interlocking apparatus for railway point and signal levers of the kind known as "tappet and plunger locking apparatus" there are sliding rods or plungers which are moved by the levers, and which have in their
25 edges V-shaped or rounded notches, and there are transverse slides or tappets with corresponding V-shaped or rounded ends that fit into the notches of the plungers. When a lever is moved, its plunger thrusts a tappet
30 out of its notch, and thus moves this tappet or a tappet on the same transverse slide into the notch of another plunger, if such notch happen to be presented for its reception, and thus the lever to which that other plun-
35 ger is connected becomes locked. If, however, no notch is presented for the reception of the tappet that has to be thrust out or for a tappet fixed on the same transverse slide, then the plunger that tends to thrust out the
40 tappet cannot do so, and consequently the lever to which that plunger is connected is locked. By suitably arranging tappets in transverse slides in relation to notches of the plungers of a set of levers these levers can be
45 interlocked consistently with the conditions of the points and signals which they work, as is well understood. It may happen, however, that when interlocking apparatus of this kind is employed one or other of the levers, though
50 it is not fully home to either end of its stroke

and secured there by its spring-catch, can unlock some other of the levers by presenting a notch on its plunger to receive a tappet which should not then be received, and serious accidents have been occasioned by such
55 unlocking of levers which ought to remain locked, except when the operating-lever is fully home and firmly held by the engagement of its spring-catch in the notch of the quadrant.
60

This invention has for its object to prevent the occurrence of such accidents by making sure that no lever can be begun to be moved at all unless it is properly unlocked and that
65 no other lever shall be unlocked by a lever so moved until the operating-lever is home and held firm by its spring-catch. For this purpose the notched plunger belonging to each lever, instead of being a single bar, is
70 made in two layers or thicknesses, the one layer lying close over the other, and both layers are provided with an equal number of similarly-shaped inclined or wedge-shaped notches. The tappets on the transverse slides are
75 wedge-shaped and of depth equal to the two layers of the plungers, so that they can enter these notches when the two layers coincide in position, but cannot enter when the one layer is so far displaced along the other that the notches in the two layers no longer coincide
80 in position. This displacement of the two layers relatively to one another is effected by the movement of the spring-catch of the lever, and consequently there is no coincidence of the notches of the two layers of any plun-
85 ger, except when the spring-catch is engaged at either end of the quadrant along which the lever is moved. From this it follows that except when a lever is at either end of its stroke and held there by the engagement of
90 its spring-catch its plunger cannot present coincident notches to any tappet, and consequently cannot unlock any lever to which that tappet is related.

The accompanying drawings show several
95 modified constructions and arrangements of parts whereby this system of interlocking can be carried out in practice.

Figure 1 is a side view, and Fig. 2 is a front view, both partly in section, of a lever- 100

frame. Fig. 3 is a plan showing the plungers and several of the tappets; and Fig. 4 is a part side view to an enlarged scale, showing the connection of the lever and spring-catch to the two layers of plungers. Figs. 5 and 6 are detail views, partly in section, showing modifications in the connections to the two layers of plungers.

In all the figures the same reference-letters are employed to indicate corresponding parts.

A is one of the point or signal levers, provided, as usual, with its spring-catch B, engaging at each end of the stroke of the lever against a shoulder or in a notch of the quadrant C. The spring-catch rod D is extended downward, and is jointed to one arm of a bell-crank lever, E, as shown in Fig. 1, or to one arm of a three-armed lever, E', as shown in Fig. 5, or to the arms of two bell-crank levers, E² E³, as shown in Fig. 6. The plunger belonging to each lever A consists of the two layers or thicknesses F and G, which, as shown in Fig. 1, are linked, respectively, to the lever A and to the upright arm of the bell-crank E, or, as shown in Fig. 5, to the two upright arms of the three-armed lever E', or, as shown in Fig. 6, to the upright arms of the two bell-cranks E² E³. Whichever of these connections be adopted the effect of raising the spring-catch rod D, so as to disengage the spring-catch B from the quadrant C, and thereby to permit the movement of the lever A, is to displace the two layers F and G relatively to one another, and thereby to make coincident notches in the edge of F and G no longer coincident. Thus, as shown in Fig. 4, the notch *g*, which, when the spring-catch is down, coincides with *f*, is displaced by the raising of the spring-catch, as indicated by the dotted lines at *g'*.

The tappet bars or slides H are arranged to slide across the lines of plungers F G, and, as here shown, such tappet bars or slides are located both above and below plungers; but I do not confine myself thereto. The tappet bars or slides H are each provided with wedge-shaped tappets K, which can enter the inclined notches of the plungers F G, or can be thrust out of said notches by the movements of the plungers when they are free to be so thrust out. For example, as shown in Fig. 3, the transverse slide H has two tappets, K', engaged in a notch of the plunger F', and K², facing a notch in the plunger F². In this condition F' might be moved in the direction of the arrow, thrusting K' out of its notch, because K² is free to enter the notch of F²; but if F² were moved so as to displace its notch from K², or if the two layers F and G of F² were relatively displaced by the raising of the spring-catch to which F² belongs, so that the notches presented toward K² no longer coincide, then, as K² could not enter a notch in F², the slide H could not be moved, the tappet K' could not be thrust out of the notch of F', and consequently the lever to which F' belongs would remain locked. Again, assum-

ing that the notch of F² could receive the tappet K², then if the spring-catch of the lever to which F' belongs were raised the displacement of one of its layers would thrust K' out, and would consequently engage K² in the notch of F², thus locking the lever to which F² belongs. It will thus be seen that the raising of the spring-catch of any lever before the lever itself begins to move locks all other levers that should be locked, and that after moving a lever there is no unlocking until the spring-catch of the moved lever is lowered to engage with the quadrant.

Heretofore it has been proposed to make sliding locking-bars in two layers or thicknesses, worked, respectively, by a lever and its spring-catch, and having notches to receive transverse sliding bars which are worked to and fro by extraneous devices; but such notched bars do not of themselves actuate a locking-gear, as in my invention, and there is no interlocking apparatus for the levers or any tappet and plunger devices, as in my invention.

What I claim is—

1. The combination, in tappet and plunger interlocking apparatus for railway point and signal levers, of plungers made in two layers, tappets, levers, and spring-catches, said layers of the plungers moved, respectively, by the levers and the spring-catches, and having inclined notches which actuate the tappets and receive, the latter only when the spring-catches are down, substantially as described.

2. The combination, in tappet and plunger interlocking apparatus for railway point and signal levers, of the plungers made in two layers, F and G, having inclined notches *f* and *g*, the levers A, the spring-catches B, the rods D, said levers and rods respectively connected with the layers of a plunger, and transverse slides H, having wedge-shaped tappets which are actuated by the inclined notches of the layers of the plungers when the latter are moved lengthwise, substantially as described.

3. The combination, with the levers and the spring-catches therefor, of plungers made in two layers and provided with inclined notches and wedge-shaped tappets which are thrust laterally out of engagement with one plunger by the inclined notches thereof when such plunger is moved lengthwise and into engagement with the inclined notches of the adjacent plunger, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 3d day of May, A. D. 1888.

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