(No Model.)

W. G. SCOTT.

RAILROAD SIGNALING APPARATUS.

No. 522,676. Patented July 10, 1894.

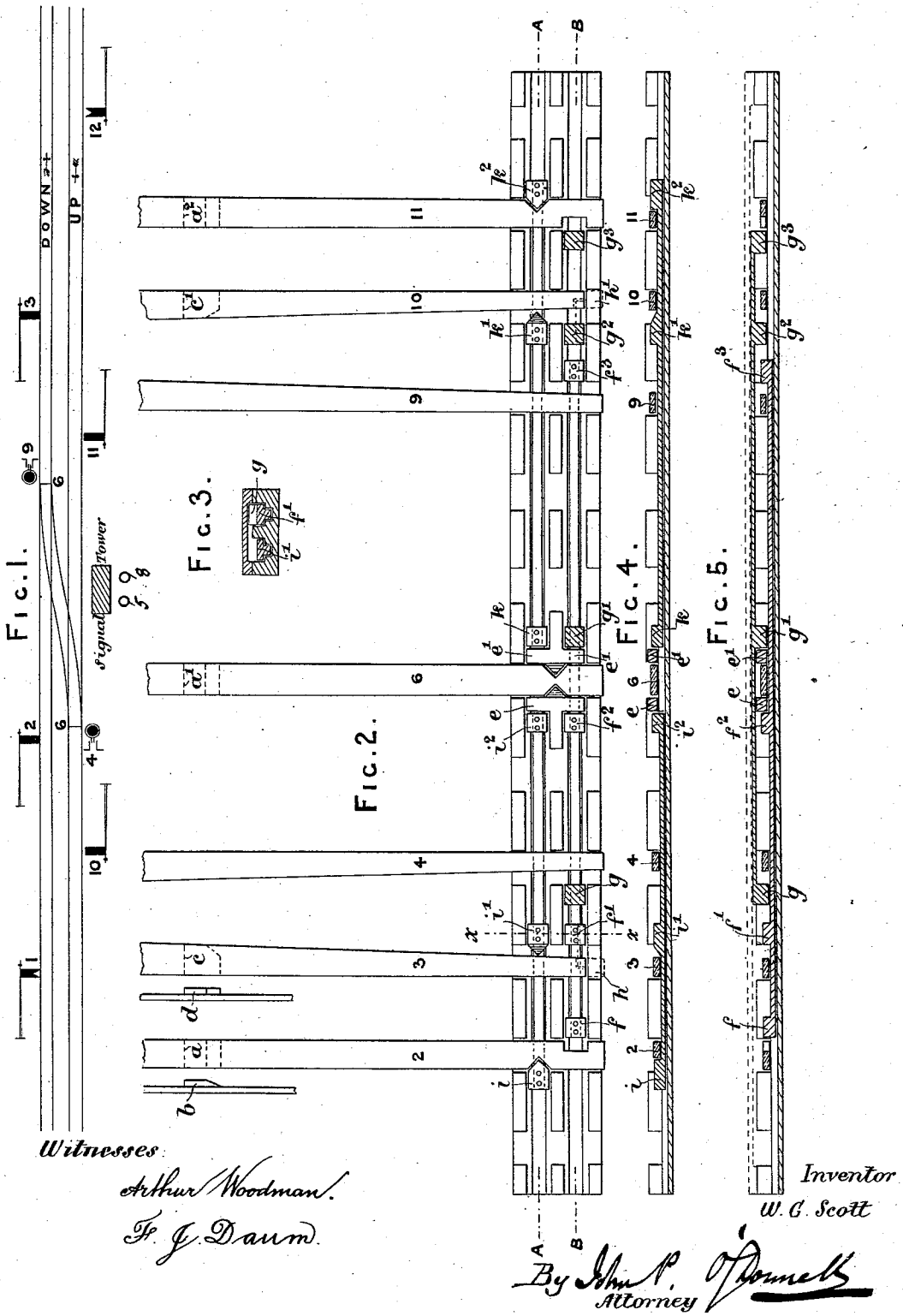

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

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RAILROAD SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 522,676, dated July 10, 1894.

Application filed June 18, 1892. Serial No. 437,215. (No model.) Patented in England November 11, 1891, No. 19,575.

To all whom it may concern:

Be it known that I, WILLIAM GEORGE SCOTT, engineer, a subject of the Queen of Great Britain, residing at Liverpool, in the county of Lancaster, in the Kingdom of England, have invented certain new and useful Improvements in Railroad Signaling Apparatus, (for which I have received Letters Patent in England, dated November 11, 1891, No. 19,575,) of which the following is a specification.

My invention of improvements in lock signaling consists of additions to the interlocking of levers working points and signals ordinarily in use on railways. These additions to the interlocking, which I have named "automatic check locking," are for the purpose of preventing a signalman forgetting that he has shunted a train from one main line to another (as was the case, and which caused the accident, at Norton Fitzwarren near Taunton on the 11th of November, 1890) or from a goods line or siding to a main line. My invention attains something more than this; for, providing that, after a train has arrived inside a home signal, a cross-over-road from the main line upon which the train is standing to another main line, or to a goods line or siding be used, the train will be protected by the fixed signals until it is allowed to depart into the section in advance, or until it has been shunted clear of the main lines.

That my invention may be understood, I proceed to describe the drawings hereunto annexed, such description enabling any one to carry out the same principle in all cases differing from that illustrated, such as at junctions, places where there are more than two main lines, or where there are goods lines or sidings, or both.

Figure 1 is a diagram of an ordinary block signaling station where there is a cross-over-road from one main line to the other. Fig. 2 is a plan view of the tappets and the locking case with the cover removed. Fig. 3 is a cross-section taken on the line $x\,x$ in Fig. 2. Figs. 4 and 5 are longitudinal sections taken respectively on the lines A A and B B in Fig. 2.

The figures on the diagram are the numbers of the levers in the signal cabin working the points and signals as follows: lever No. 4, down distant signal; lever No. 2, down home signal; lever No. 3, down starting signal; lever No. 4, up to down line signal; lever No. 5, spare; lever No. 6, cross-over-road points; lever No. 7, facing-point-lock on No. 6 points; lever No. 8, spare; lever No. 9, down to up line signal; lever No. 10, up starting signal; lever No. 11, up home signal; lever No. 12, up distant signal.

My invention only affects levers 2, 3, 4, 6, 9, 10 and 11, and it must be understood that the usual interlocking between these levers, namely, 2 and 11 interlocking with 6, 3 and 10 locking and back locking 6, 6 preceding 4 and 9, and 4 and 9 interlocking, is to be carried out by any of the ordinary systems at present in use.

Fig. 2 is a plan, and Fig. 3 a section, of a locking case (the plan shown with the cover removed) for locking gear of the type well known as "tappet" locking, and the parts numbered according to the levers to which they are attached 2, 3, 4, 6, 9, 10 and 11 are tappets; 2, 6 and 11 being similar to tappets ordinarily in use, but having pieces $a\,a'\,a^2$ on their under sides, b being an elevation of these pieces. Tappets 3 and 10 are tapered and have pieces c, c' on their under sides; d being an elevation of these pieces; and tappets 4 and 9 are tapered only. e and e' are locks known as T-locks and are similar to those ordinarily in use, excepting that the nose part is thinner than the body of the lock as shown in the section, Fig. 5.

The object of the inclined blocks $a\,a'$ and a^2, fixed to the tappets, is to provide a raising device for these tappets; when the tappets 2, 6 or 11 have been sufficiently moved, their respective inclined blocks will come to rest on the frame, so that the tappets will then be able to rise on the blocks and allow the respective locks abutting on the tappets to slide under such tappets. Further, the object of the blocks c and c' on tappets 3 and 10 is, when the levers of these tappets have been sufficiently drawn over, to engage the sloping faces of the blocks $i'\,k'$ and push these blocks ($i'\,k'$) back again.

The T-locks fit into notches cut in the sides of tappet 6. Some of the other locks are thick and some thin, for purposes hereinafter described; f and f' are thick, and f^2 and f^3 indifferently thick or thin square locks connected together by a thin under strip of metal

in the ordinary way; and g^2 g^3 are thick, and g and g' indifferently thick or thin square locks connected together by a thin overstrip of metal in the ordinary way. In the drawings, the tappets are shown in the normal position, with the levers back in the frame, and it is evident that, when the cross-over-road lever 6 is pulled over, the tappet of the same number will cause the T-locks e and e' to spread, and these, in their turn, will force the locks f, f', f^2 and f^3 to the left, and the locks g, g', g^2 and g^3 to the right. This will lock levers 2 and 11 working the home signals, and these can only be released, first, by the pulling over of lever 3 or 9 which will draw the lock f out of the notch in tappet 2: and second, by the pulling over of lever 4 or 10 which will draw the lock g^3 out of the notch in tappet 11, it being possible to do this while the cross-over-road lever 6 is still over, as the piece a' on the under side of tappet 6 has, at the end of the stroke of that tappet, caused it to be lifted sufficiently to allow the thin part of the T-locks e and e' to slide under the tappet, the thicker part of the locks preventing their being pushed so far, that they will not re-engage with tappet 6 when lever 6, to which the tappet is attached, is put back into its normal position.

Taking a case in illustration—supposing a train to have arrived inside the home signal 2, which signal has afterward been put to "danger," and the train shunted from the down to the up line, the signal 9 having been used for this purpose; the signalman would now be free to use signal 2 again, but not signal 11 until signal 4 had been used to signal the train back to the down line, or signal 10 to allow it to depart on the up line.

Providing that a signalman is in the habit, after receiving and giving the telegraphic signals for a train, of lowering the home signal before the starting signal, the above described "automatic check locking" fulfills what is required of it, but I find, from observation, that many signalmen are in the habit of lowering the starting signal first, and, to compel the signalman to acquire the habit of lowering the home signal before the starting signal, and, to make him lower the home signal first, excepting when a cross-over-road between the main lines, or between the main line and a goods line or a siding, has been used, I shorten the tappets 3 and 10, as shown, and rivet pieces h h', which I call fast-locks, on to the locking case at the end of the tappets, or I cut square notches in the tappets 3 and 10 and rivet pieces on to the locking case, as shown in dotted lines, so as to prevent tappets 3 and 10 being moved by the levers to which they are attached until they (the tappets) have been lifted above these fast-locks. (In case the square notches are cut in tappets 3 and 10, and the pieces for the fast-locks riveted on to the locking case, as shown in dotted lines, locks f' and g^2 would have to lie partly by the side of, and partly on, the pieces riveted to the locking case.) To lift tappet 3, I employ the locks i, i' and i^2, these being connected together by an under strip of metal in the ordinary way; lock i is a thin lock, lock i^2 indifferently a thick or thin lock, and lock i' a wedge-shaped lock, as shown in the section, Fig. 4. To lift tappet 10, I employ the locks k, k', and k^2, k^2 being a thin lock, k indifferently a thick or thin lock, and k' a wedge-shaped lock as i' in Fig. 4 reversed. Supposing lever 2 or 6 to be worked, the locks i i' and i^2 are drawn or forced to the left, the wedge-shaped lock i' raising the tappet 3 over its fast lock. When lever 3 is worked, the piece c on the under side of tappet 3 will come in contact with the lock i' and force the locks i, i' and i^2 back into their original positions, the thin lock i passing under tappet 2 if that tappet is pulled over and lifted by the piece a on its under side, or the thin part of the T-lock e will pass under tappet 6 if that tappet is pulled over and lifted by the piece a' on its under side. In like manner, tappet 10 will be released by the working of tappet 6 or 11, and the locks k, k' and k^2.

I declare that what I claim is—

The combination, with a locking case, of the tappets 2, 3, 4, 6, 9, 10 and 11 sliding therein, the tappets 2, 6 and 11 being notched and provided respectively with the blocks a, a' and a^2, and the tappets 3 and 10 being provided with the blocks c and c'; the locks i, i' and i^2 connected together and pertaining respectively to the tappets 2, 3 and 6; the locks k, k' and k^2 connected together and pertaining respectively to the tappets 6, 10 and 11; the locks f, f' f^2 and f^3 connected together and pertaining respectively to the tappets 2, 3, 6 and 9; the locks g, g', g^2 and g^3 connected together and pertaining respectively to the tappets 4, 6, 10 and 11; and the T-locks e and e' having their nose parts engaging with the notches in tappet 6, and operating the locks i^2, f^2, and k, g', substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

W. G. SCOTT.

Witnesses:
WM. B. THOMPSON,
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