In 1949, the newly formed Western Region took over all the ex-L.M.S. lines in South Wales, in 1950 the W.R. absorbed all the ex-S.R. lines west of Exeter and ex-L.M.R. lines South and West of Birmingham. Note: these lines are not included in this Register, as the work is based on the G.W.R. as at 1947. In January 1963 there were some wholesale transfers of areas between regions: lines north of Heyford, Cutnall Green and Craven Arms were lost to the L.M.R. and the S.R. territory west of Salisbury was transferred to W.R. control.

7. Layout of register

An alphabetical index of signal box names is given in Section 10 and a list of the different sections of line is given in Section 11. In each case the 'railref' code and the section number are given. Detailed information about each box is then listed in Section 12.

A small extract from Section 12 is given below to illustrate the format: this is section E13 - the name of the line is given, followed by details of each box along the route. Signal boxes controlling a junction are listed with the 'main line' regardless of their precise position in relation to the physical junction(s) and the milepost mileage quoted is that which relates to the line shown. A junction signal box may thus be shown with a milepost mileage of a few chains where it is sited a short distance along a branch line where the zero point for the branch line is the junction, whereas it would be shown with its 'main line' milepost mileage on the main line. Here the mileages on main and branch lines do not correspond.

There is a horizontal line ruled between each signal box, with boxes normally listed in the down direction. This line is dotted where boxes are listed in the up direction. For each box a 'railref' reference is given (with a note of any converging or diverging lines controlled from that signalbox). A separate line is used to show different generations of box (identified by a sequential number in the '**#**' column) and, within each generation, different frames. Where a box is rebuilt on the same (or similar) location it is given the next 'generation number' - if it is renamed, either during the previous generation or on rebuilding this is explained in the footnotes (and shown in the index).

The terms used under the column headings are explained below.

E13: Moretonhampstead Branch

				Signal Box				Locking Frame				BS	Notes
Ref	M	Name	#	Opened	Closed	Type	Construction/Size	Type	Cen's	Size	Date		
excluding Newton Abbot East (see GW 250-310, Section E1) - milepost mileage 0.00 originally Newton Abbot 'C'													
GW 260-010	0.49	Newton Abbot Goods Yard		00.00.1911	25.04.1926		17'6" x 11' x GL	GW Stud	5"	12	Yes	Y	
GW 260-020	2.27	Teigngrace		by 00.07.1887	14.11.1901	GW 21	15' x 8'6" x PL			11			
GW 260-030	3.74	Heathfield	1	L 00.1893	00.00.1916	n/s	Brick			25		N	
			2	00.00.1916	12.10.1965	GW 7D	33'6" x 12' x 9'	GW VT3	4"	42	Yes	N	
								GW VT5	4"	58	0.1927	N	
››GW261		››Chudleigh, see Section E12											
GW 260-040	6.07	Bovey		od 06.1892	02.03.1959	GW 6	15' x 8'6"	GW DbTw	5¼"	17	Yes	N	E78
GW 260-050	8.67	Lustleigh		by 00.07.1887	14.11.1901	GW 6	15' x 8'6" x PL			13	Yes		
GW 260-060	12.20	Moretonhampstead		00.00.1892	02.03.1959	n/s	17'3" x 8' x GL			15	Yes	N	
								GW Stud		12	c 00.1920.	N	

Section E notes

E78	Conv. Stud		

Column headed 'Ref'

Each signal box is given a unique three digit number which indicates its position, sequentially, along the route concerned. Each route has a five letter/digit code (RailRef) with distance along the line of route being given by the milepost mileage. Boxes are listed in the Down direction, i.e. going away from London. Junctions are indicated by » followed by the railref line code for the converging or diverging line. The adjacent box on that line is given in the 'name' column, along with the section number where details of boxes on that line are given. If no section number is given, then the branch is one with no intermediate boxes, often just a short chord linking two lines.

Column headed 'M'

Milepost mileage: the distance in miles and chains (mm.cc) (there are 80 chains to the mile, each chain being 22 yards or 20.1 metres) from the 'zero point' location (usually identified in the section heading). For the main lines and more important branches this is the distance from Paddington. Distances have been included, where known, for all boxes. The replacement box at some locations may have been in a new position, no earlier or later box should be more than about 10 chains difference from the mileage stated.

Column headed 'Name'

The name of the signal box is defined as that carried on the structure itself (excluding the words such as “cabin”, “signal box” etc.). This may vary slightly from the title shown in working timetables, appendices or on the signal box diagram. Obviously photos are not to hand of all boxes, in which case the name commonly used is given herein. No distinction is made between 'Jct', 'Jcn' and 'Junction' nor between 'Sdg', 'Sdgs' and 'Siding'. Where there have been two boxes at one station or location, but one of these closed/opened before or after the other the suffix such as East is shown in brackets to indicate that during the period that the other box existed it carried this title, but was renamed on the opening or closing of the other box. This avoids footnotes in each such case. In some cases part of the box name appears in square brackets (for example Station [Barrs Court Hereford]) and the portion within the brackets [thus] never appeared on the nameplate but has been added to clarify matters where listed out of context, for example in the alphabetical index.

Inevitably some abbreviations have had to be used: Jct=Junction; Nth=North; Sth=South; Rd=Road; Shntg=Shunting; Cmn=Common; Ln=Lane; Dn=Down; Bdge=Bridge; Ctl=Central; ; LC=Level Crossing; Gds=Goods; Pk=Park; GF=Ground Frame; NBP=non block post; BP=block post.

Column headed '#'

Where more than one box existed at a location (or nearby and bearing the same name), then the cardinal numbers are used to show the respective details. Where the box continued in use with a new frame, then the frame details are shown on separate lines. This column is also used to show the prefix letters for the box. This denotes the identification letters appearing on an enamel plate on the signal box and/or on signals controlled therefrom.

Column headed 'Opened'

This is the date (or year) when the box was brought into use. Where a box was built in advance of commissioning, information appears in the ‘Remarks’ column. Where the opening date is not known, “od” denotes the date that the box was ordered; this is usually a few months before it was commissioned, though in some cases over a year elapsed.
“c.” denotes approximate date.
“n” denotes the box was built but never commissioned.
“I” denotes date inspected.
“L” denotes the year “interlocking completed” in returns made to the Board of Trade.
“W” denotes date derived from working timetable or sectional appendix. Though generally reliable, boxes were sometimes in use over a year before they first appeared in such publications; similarly, some boxes continued to be listed even though they had been taken out of use. These dates are therefore not so reliable as the other sources. Boxes shown as 'open 2011' were still open as at 10th May 2011.

Column headed 'Closed'

Defined as the day on which a box became incapable of functioning as a block post; i.e. all arms and lamps removed or block switch/instruments disconnected. (Some boxes were permanently switched out of circuit prior to this date but were still capable of being manned if required.). In cases where the entire line closed, the closure date given is that of the line, even though the box may have remained in situ until actually demolished some time later.
“B” denotes box destroyed by bombing on date shown.
“F” denotes box destroyed by fire on date shown.
“A” denotes box destroyed by accident on date shown.

Column headed 'Signal box type'

Boxes are described according to the classification developed by The Signalling Study Group (see 'The Signal Box – A Pictorial History and Guide to Designs'; 1986, Oxford Publishing Company). Where it is only known that a box was timber or brick, then this is so indicated. Other notes used are n/s non-standard; GL ground level; BTF brick to floor and PL platform level. 'E' indicates that the box itself has been extended (to the new size shown), usually in connection with the installation of a new frame. The nomenclature is explained in Section 9.

Column headed 'Signal box Construction/size'

Size is quoted in feet and inches, the first figure is the length, the second the width, and the third is the height above rail level (ARL). Ground level ('GL') boxes have an ARL of 0ft. Length and width are measured externally unless otherwise stated - (i) indicates internal measurements. They may vary from those given on official documents.

Column headed 'Locking frame type'

The different types of frame are indicated by a code, explained in more detail in section 8. This gives the frame design (and manufacturer where different and known) as well as any additional information. 'Conv' means locking converted or replaced by the type shown, with the existing lever frame retained. Further details about the mechanical frames can be found in The Signalling Study Group's 'A Guide to Mechanical Locking Frames', a revised edition of which is shortly to be published by the SRS. The two-letter abbreviations used in this section to identify the manufacturer are explained in section 8. Where two names appear, e.g. StRS, this indicates that the frame is of a Stevens design but has been manufactured by the Railway Signal Company. Where a date (or other suffix) appears after the manufacturer's name this differentiates it from an earlier or later patent/model, e.g. SF 1871 and SF 1874. As used throughout, 'U' or 'u' indicates that the information (type of frame) cannot be confirmed.
'BO' means the frame was situated in the station booking office. Almost every mechanical frame manufactured in the 20th Century and a significant proportion of those from the latter part of the 19th were tappet locked from the outset. In addition, a majority of those 19th Century frames which were non-tappet at manufacture were relocked with tappets at or around the turn of the 19th/20th Century. Tappet locking is thus not always identifed specially.

Column headed 'Locking frame Cen's'

The distance between the centre of one lever and its neighbour in a frame is shown in inches. It should be noted that in a small number of early frame designs, not all levers were spaced at the same pitch.

Column headed 'Locking frame Size'

This shows the number of levers in the frame at the date of installation with any known changes subsequently being entered in the next row down along with the date of the change in the 'Remarks' column.

Column headed 'Locking frame Date'

The date that the frame was installed is entered (where known) or the date of the signal box's commissioning if not. "Yes" means coincident with the opening of the box. "O" Date frame ordered from works. "T" Date frame tested, usually coincident with opening of box or installation of new frame. "E" Denotes frame extended to this size. "S" Denotes frame shortened to this size.

Column headed 'BS'

Y Denotes block switch (or switch lever) provided. N Denotes block switch not provided
P Denotes block switch added later (date shown if known) R Denotes block switch recovered at later date.
NB Denotes non-block post

Column headed 'Notes'

A numbered reference is given to a footnote. The footnotes are listed at the end of each section. Other abbreviations include:

GF Date box reduced in status to ground frame. In this case closure date is that when the post was finally abolished.

Web Further details such as box diagram, dog chart, locking table etc. may be found at http://www.svrsig.org/diags/Diagrams.htm#list.

NB Non block post.

M Information derived from GW Magazine; though usually reliable, some information contained therein is suspect, particularly when new works are involved.

Z Denotes temporary box

U or u (In any column) denotes information unconfirmed.

8. Locking frame types

There were many different manufacturers of locking frames - the diversity of design being a necessary commercial imperative so that patent rights were not infringed. A signalling paper has been produced by the SRS explaining the principles of tappet interlocking and other signalling papers describe the Great Western 3- and 5-bar tappet frames and the twist frames in some detail. A series of articles on Railway Interlocking Frames by O.S.Nock was published in *'The Model Engineer'* in 1946 and 1947. A printed edition of the Signalling Study Group's *'A Guide to Mechanical Locking Frames'* is to be published by the SRS shortly.

The different types of locking frame all fulfilled the same purpose - of locking the levers in the frame so that conflicting routes could not be set up, that signals could only be lowered once the correct route had been set up and the route could not be changed unless the signal lever had been restored to normal.

The table below provides a key to the standard abbreviations used under the heading 'locking frame type' to indicate the type of frame provided and the method of locking used. Mechanical and electrical locking frames are initially described by the company who designed the equipment and these prefixes are listed in the column headed 'Code' below. The designed may or may not be the manufacturer and so where four letters are shown, for example 'StWh', the frame was designed by the first named, i.e. Stevens, but manufactured, usually under licence, by the second, i.e. Westinghouse. In the case of Stevens' frames only, since these were produced over time by various manufacturers, the latter, if known, is shown in this way but those known to have been produced by Stevens themselves are shown as 'StSt' and where the manufacturer is not known, then it is shown simply as 'St'. A suffix gives other information, where known, to describe the particular type of frame. Sometimes a generic suffix is shown, e.g. 'GF' for ground frame or 'Spl' for a frame to a unique or very rare design. Where frames were given a serial number by the manufacturer, these have been included where known, e.g. 'No. 11232' and 'No.L55'.

The list of abbreviations below is intended to be comprehensive across the British Isles and not all terms listed will be used in this register. Frames made up from mixed second-hand and new parts in a Railway Company's or B.R. Region's works are noted as 'recon' after the frame type if believed or known to be from multiple sources, or '2h' if believed or known to be largely a single frame from another box (with some new or reused parts).

In a small number of cases, the information available (given in parenthesis) is insufficient for a positive identification of one of the standard abbreviations, e.g. '(DirT5)' to signify '5 bar direct tappet' - many ground frames used direct tappet locking. A full list of the non-standard terms used in this register is given at the end of the main table.

Code	Frame design and method of locking	Frames Guide	Years of manufacture	Example of usage
	Anderson			
An	This lever (direct) locking frame included a selector lever to choose a route. Manufactured by Courtney & Stephens and Yardley.	p.72	u1864 - u1874	—
	Bailey			
Ba	Courtney & Stephens manufactured this lever (direct) locking frame, not sold outside of Ireland	p.73	1874 - u1877	—
	British Pneumatic Railway Signal Company			
BP LP	This was a low pressure pneumatic frame with pull out handles and slides	—	1901 - nk	—
BP pf	This was a power frame	—	1912	—
	Brady			
Br	Manufactured by the SER and Vickers, the frame is made up from several sections each separately fixed. The locking is driven directly by the levers at a pitch of 5". Also known as 'Brady Cam' and 'SE Cam'	p.134	1867 - c.1890	—

8. Locking frame types (cont'd)

Code	Frame design and method of locking	Frames Guide	Years of manufacture	Example of usage
	Chambers			
Ch Stp	This design had point levers located between signal stirrups	p.34	1860 - c.1861	*GW 001-090*
Ch Lvr	Manufactured by McKenzie & Holland (u) this revised design using lever (direct) locking was only suitable for simple layouts	p.35	c.1861 - c.1866	—
	Cheshire Lines Committee			
CL	Manufactured by the CLC at Warrington, this development of the Stevens tappet design featured lever (direct) tappet locking at a 5" pitch.	p.116	1885 - c.1935	GW 844-080
	Dell			
De pf	An electro-mechanical power frame developed for the LPTB (possibly the same as the Wh type 'V' interlocking machine).	—	1940s - nk	—
	Dutton			
Dn Com	The first Dutton design with tappets driven both by the catch-handle and the lever, and thus named 'combination'. The levers were at a 4½" pitch (in most if not all frames).	p.90	1888 - 1892	CM 040-020
Dn 1889	This design (1889 patent) allowed the lever handle to pivot, driving the tappet and effecting the locking.	p.91	1889 - 1890	—
Dn 1893	A redesign (1893 patent) of the combination frame, with the tappet locking drive adapted to work from a more conventional but characteristic catch handle. Lever pitch was 4" or 4½".	p.93	1892 - c.1914	CM 001-260
Dn DirT	This simple direct tappet design used curved tappet irons and was manufactured by Dutton and Pease. Lever pitch was 4" or 4½".	p.92	c.1890 - c.1900	CM 050-080
	Easterbrook			
Ea 1867	The locking on this March 1867 patent design was lever-actuated but operated on the catch-handle. Only one was ever installed but it was the first design to incorporate catch-handle locking.	p.74	1867	*GW 157-100*
Ea 1868	The locking on this 1868 patent design is unusual, certain levers being taller with a second catch rod driving a horizontal locking bar. Other levers drove a vertical studded bar, the studs effecting the locking. Lever pitch was 6".	p.75	1868 - u1872	—
Ea 1872	This (1872 patent) design reverted to lever actuation with locking actuated by vertical studded bars working against horizontal locking bars. Lever pitch was 6".	p.77	1872 - 1886	—
	Evans O'Donnell			
ED	Several Evans O'Donnell designs evolved but this design based on an 1891 patent and manufactured by themselves as well as Saxby & Farmer and Westinghouse was the only one known to have been used in the UK. The tappet locking was driven by the catch-handle. Lever pitch was 4".	p.95	1895 - 1922	*BY 001-110*
	Great Central Railway			
GC	The standard GC frame of later years, manufactured mostly by RS but also by MK, SF, Wh and BP. A simple direct tappet design with characteristic 'jug-handle' catch handles. Lever pitch was 4" also 4½".	p.101	1905 - 1927	—
	Great Northern Railway			
GN Clu	This design was the GNR's first in-house design with lever-actuated locking, named 'clutch'. Pitch was 3½".	p.96	c.1869 - c.1873	—
GN EL	A simple lever-actuated, direct tappet design with levers at a pitch of 4¼".	p.96	c.1887 - c.1904	—
GN Tap	A lever-actuated, direct tappet design with levers at a pitch of 4".	p.98	c.1883 - c.1913	—
GN Dup	This became the GNR standard frame design, manufactured by SF, Ty, MK, Atkinson and Wh. It is almost identical to the 'SF 1905' (duplex) frame but with cylindrical-section bent catch-handles. Also known as 'no.26' by MK. Lever pitch was 4".	p.99	c.1909 - c.1927	—
	Gloucester Wagon Company			
GR	The locking was lever-actuated, driven by a cam plate attached directly to the lever (Edward's patent). Lever pitch was 5".	p.85	1876 - 1884	MW 020-050
	General Railway Signal			
GS pg	An electric power frame with 'pistol-grip' slides.	—	1932 - nk	—
GS 'C'	An electric power frame with 'pistol-grip' slides.	—	1933 - nk	GW 001-010
GS 'D'	An electric power frame with 'pistol-grip' slides.	—	1935 - nk	GW 150-390

8. Locking frame types (cont'd)

Code	Frame design and method of locking	Frames Guide	Years of manufacture	Example of usage
	Great Western Railway			
GW DbTw	A simple modification of the SgTw design to effect both initial locking and final releasing by including two twists (double twist) in the the twist bar driven by the lever. Lever pitch was 5¼".	p.126	u1890 - 1906	GW 080-140
GW HT3	A cam plate drives horizonal tappets via a vertical drive rod. Each locking channel contains three bars. Lever pitch was 5¼" as for earlier frames.	p.129	1906 - c.1908	GW 030-060
GW HT3	A cam plate drives horizonal tappets via a vertical drive rod. Each locking channel contains three bars. Lever pitch was 4" in a revised design of frame.	p.129	1908 - 1926	GW 080-120
GW La	This 1865 patent design by Lane was lever-actuated, driving lock plates by rack and pinion.	p.125	u1865 - u1870	GW 824-010
GW SgTw	The twist bar, driven by the lever, performed locking and releasing at the same part of the stroke, named 'single twist'. Lever pitch was 5¼".	p.125	1870 - 1890	GW 440-120
GW Stud	Each lever directly drives one or more curved blades. Slings around a tier of blades have studs operating in slots and notches on the blades. Lever pitch was 4" or 5¼".	p.128	c.1892 - 1908	GW 040-030
GW VT3	A development of the 4" HT3 frame, but only used for frames with less than 60 levers to avoid excessive height. Pitch 4".	p.130	1908 - 1926	GW 020-050
GW VT5	A cam plate drives vertical tappets. Each locking channel contains five bars. Lever pitch 4".	p.131	c.1926 - 1966	GW 020-020
	Greenly			
Gy	A special design (1927) for the Romney, Hythe & Dymchurch Railway.	p.146	1927	—
	I'Anson			
IA 1867	A lever-actuated design.	p.78	c.1867 - c.1869	—
IA 1869	A simpler design (1869 patent) where the lever directly drove a vertical rod with pins working in slots in horizontal locking bars.	p.78	1869 - c.1887	—
	London, Brighton & South Coast Railway			
LB 1880	A simple direct-tappet design closely based on the 'SF 1874' design. Pitch 5".	p.132	x.1880 - 1896	—
LB 1905	A simple direct-tappet frame. Pitch 5".	p.133	1905 - 1928	—
LB lug	-	—	nk	—
LB Spl	A 5" pitch direct lever tappet frame. Also known as 'Bosham pattern'.	p.146	1901 - 1904	—
	London, Chatham & Dover Railway			
LD	A lever-actuated, direct-tappet design. Pitch 4¼".	p.137	c.1878 - c.1906	—
	London Midland Region			
LM	The final form of the 'Midland' frame, designed in 1943 but not produced until 1948/9. The tappet locking was 'standard 1943 pattern' catch-handle actuated. Pitch was 4½" or 6".	p.114	1948 - c.1970	GW 750-365
	London, Midland & Scottish Railway			
LS 1938	A 1938 development of the 'NW Tap' design. Levers were 4½" pitch with stirrup catch handles.	p.146	1938	*GW 641-030*
LS DW	Point switches are worked from two wires worked from a wheel, hence the name 'double wire'. The levers move through 180° with locking actuated by the catch handle.	p.143	1923 - 1940s	—
LS Wig	A variant of the 'RE' design, with LNW-style stirrups instead of catch handles. All three were installed at boxes in the Wigan area.	p.146	1940	—
	Lancashire & Yorkshire Railway			
LY Tap	This design is based on the 'RS Tap' design with a few minor variations. Pitch 5½".	p.124	1889 - c.1928	—

8. Locking frame types (cont'd)

Code	Frame design and method of locking	Frames Guide	Years of manufacture	Example of usage
	McKenzie & Holland			
MK 16	This was the first MK direct action tappet design, manufactured by MK and Wh. Pitch was 5".	p.70	1903 - 1924	—
MK 17	Identical to the 'MK 16' design, except for lever pitch which was 4".	p.70	1903 - 1924	TV 030-040
MK 21	This lever (direct) tappet design (1908 patent) was a development of the type 16, 17 and 17A designs. Pitch was 4".	p.69	1908 - c.1920	TV 030-260
MK 1866	This was the first mass-produced MK frame and existed in no. 1 (6" pitch) and no. 2 (5½" pitch) versions.	p.61	1866 - 1873	—
MK 1873	Also known as 'MK Hook' and 'MK cam and soldier', this design existed with several minor variations (no. 4 at 6" pitch, nos. 5, 5A, 6 and 6A with 5" pitch and no. 8 with 6" pitch).	p.62	1873 - c.1888	GW 510-130
MK 1886	This lever-actuated frame design existed in no. 9 (4½" pitch), no. 11 (5" pitch) and no. 12 (4" pitch) variants. Also known as 'T-bar', 'Holland & Page' and 'H&P'.	p.65	1886 - 1890s	BM 001-070
MK CT	This lever, indirect tappet design, was named 'cam & tappet' and was manufactured by MK and Wh. It existed in no. 13 (4" pitch) and no. 14 (5" pitch) variants.	p.67	c.1893 - 1924	BM 030-110
MK em	This was an electro-mechanical power frame.	—	c.1930 - nk	—
	Manchester, Sheffield & Lincolnshire			
MS IB	This lever-actuated frame design is still in extensive use, but all have been relocked with tappet locking. The name 'iron brackets' relates to the actuation method but the original form of locking is not known.	p.100	c.1873 - c.1886	—
MS Tap	This lever-actuated tappet design was not used extensively. Pitch was 6".	p.101	c.1890s	—
	Metropolitan Railway			
MT Tap	This design used simple lever (direct) tappet locking at 5" pitch.	p.139	u1889 - u1896	—
	Midland Railway			
MR 1865	A somewhat crude design with up to three levers in each slot.	p.105	c.1865 - c.1869	—
MR LAT	This 'lever-action tumbler' frame was similar to the 'MR Tum' design but employing lever action rather than catch-handle locking. Pitch was 6"U.	—	u1870s - 1880s	—
MR SW	This 'single wire' frame design included wire-worked points and lever-actuated locking.	p.142	1870s - 1910s	—
MR Tap	Constructionally similar to the 'MR Tum' frame, this frame employed catch-handle tappet locking. Pitch was 6".	p.112	1909 - 1922	GW 132-100
MR Tum	This 'tumbler' frame used catch-handle locking at 6" pitch.	p.106	u1869 - 1909	GW 132-010
MR WR	Constructionally identical to the 'MR Tum' frame, but with tappet locking fitted. Although this was known as a 'works relock', the frames were actually made new in this form. Pitch was 6".	p.110	1906 - 1909	—
	North Eastern Railway			
NE	The design of this frame is not known.	p.104	c.1870	—
	North London Railway			
NL	This frame was a simple direct tappet design at a pitch of 5½" pitch.	p.123	1890 - 1909	—
	London & North Western Railway			
NW 1874	This was the first LNWR design, based on the rapidly-wearing 'SF' frames. It haad catch-handle locking with a direct drive rod. Pitch (unconfirmed) was 5½".	p.117	1874 - 1875	—
NW cam	A much-improved design using catch-handle locking using a 'cam-head rack'. Pitch was 5½".	p.117	1875 - 1876	—
NW Tap	This design used tappet locking, actuated by the catch-handle. Pitch was 5½".	p.122	1903 - c.1930	GW 030-070
NW Tum	This design was to prove one of the most successful of frame designs. Locking was lever-actuated at a pitch of 5½".	p.118	1876 - 1906	GW 810-140
	Rapier			
Ra	Also called 'Ransomes & Rapier', 'Horserake', 'Hayrake' and 'Mowing machine', this distinctive design utilised lever actuation , with the lever pivoted above floor level. Pitch was 5½".	p.81	1871 - 1880	—
	Railway Executive Committee			
RE	A development of the 'MR Tap' design with reduced lever centres, this frame used tappet locking actuated by the catch-handle at a pitch of 4½".	p.113	1923 - 1948	—

8. Locking frame types (cont'd)

Code	Frame design and method of locking	Frames Guide	Years of manufacture	Example of usage
	Railway Signal Company			
RS 1877	This lever-actuated frame (1877 patent) used locking bars and studs. Pitch was 5½".	p.86	1881 - c.1884	*BP 001-050*
RS GNI	Designed by Potter of the Great North of Ireland Railway, this simple lever (direct) tappet frame became something of a standard on BR(ER), distinguished by a noticeably long lever travel. Pitch was 4".	p.89	1930s - c.1964	—
RS LNER	This was a development of the GC design, with minor differences and referred to as 'LNER standard'. A lever (direct) tappet design at a pitch of either 4" or 4½".	p.102	c.1928 - c.1945	—
RS pf	A power frame with electric locking.	—	1903 - nk	—
RS Tap	This simple direct elever tappet frame had four variants, 'FB' (flat baseplates), 'IFB' (individual flat floorplates), 'IRF' (individual raised floorplates) and 'SC' (spring catch). Pitch was mostly 5½" with some at 4".	p.87	1884 - 1920s	—
	South Eastern & Chatham Railway			
SE cam	see 'Brady cam'	p.134	-	—
SE NP	This 'new pattern' frame was patented jointly (1907) by Sykes and SECR with reduced movement, lever-actuated tappet locking. Pitch was 4½". Also known as 'Sykes & Hallam'.	p.138	1907 - 1928	—
SE Tap	This frame was similar to the 'Br' frame but with lever (direct) tappet locking. Pitch was (mainly) 4½".	p.136	c.1890 - c.1906	—
	Saxby			
SX 1856	Signal rods were coupled to point rods with extra levers provided to put a signal to Danger. The signal and point levers were at different pitches in this 1856 patent design.	p.45	1856 - 1860	*GW 001-040*
SX 1860	This frame design was lever-actuated with irregularly-shaped locks, pivoted each end on the main frame and a locking bar. Signal and point levers could be at different pitches.	p.47	1860 - 1867	—
	Saxby & Farmer			
SF Wdg	This design (July 1867 patent) used catch-handle activation via diagonal wedge pieces. Pitch (unconfirmed) was 5½".	p.49	1867 - c.1869	—
SF BC	This design (July 1867 patent) was a further development with the catch rod activating longitudinal bars by means of bell cranks. Pitch was 5½".	p.50	u1867 - 1871	—
SF 1871	This design (1871 patent) used catch-handle activation with a rocker arm to translate grasping and releasing of the catch handle at each end of the lever movement into additive movement. Pitch was 5" or 6".	p.51	1871 - 1874	—
SF 1874	A further development (1874 patent), one of the best non-tappet designs, with an improved rocker action. Pitch was mostly 5" with some earlier 4".	p.53	1874 - 1888	BM 030-250
SF 1888	This design used tappet locking and catch-handle actuation, the first to combine these, christened 'Duplex'. Pitch was 4".	p.56	1888 - 1905	GW 663-020
SF 1905	A further development (1905 patent), also using Duplex locking. Pitch was 4" or 4½".	p.57	1905 - u1914	—
SF 1914	This design (1914 patent) featuring catch-handle actuation of a single tappet was little used in the UK but was the predecessor of the 'Wh A2' and 'Wh A3' frames. Pitch was 4".	p.59	1814 - 1924	—
	Siemens			
Si	An electric power frame.	—	c.1900 - nk	—
Si FI	A further development (the 'Ferreira Insell' design) with four-position route levers and point slides underneath.	—	nk	GW 089-100
	Siemens/ General Electric			
SG pf	An electric power frame with miniature levers.	—	c.1930 - nk	*GW 080-140*
SG rs	An electric power frame with a route-setting panel.	—	c.1960 - nk	—
	Smith			
Sm	This frame design used locking activated by a treadle in front of the lever.	p.80	1870 - 1882	—
	Stevens			
St Cal	A Caledonian development of the 'St GNP' design at a pitch of either 4¼" or 5¼".	p.44	c.1897 - c.1964	*GW 303-010*
St GNP	A development of the 'St GOP' design, named 'Glasgow New Pattern. Lever pitch was 4¼" or 5¼" or mixed.	p.41	c.1865 - c.1923	—
St GNP (GSW)	A variant of the 'St GNP' design developed by the GSWR. Pitch was 4¼".	p.43	-	—

8. Locking frame types (cont'd)

Code	Frame design and method of locking	Frames Guide	Years of manufacture	Example of usage
	Stevens (cont'd)			
St GOP	A variant of the 'St Tap' design 'Glasgow Old Pattern' with pitch of 4¼" or 5¼" or mixed.	p.40	c.1868 - 1900s	—
St GOP (GSW)	A variant of the 'St GOP' design developed by the GSWR. Pitch was 4¼".	p.42	-	—
St Hook	Each point lever worked a locking bar to which were fitted hooks to lock other levers as necessary.	p.35	1860 - 1870	—
St Knee	A development of the 'St Tap' design but wholly above ground for ground-level boxes and ground frames. Pitch was 4⅝".	p.140	u1880s - 1960s	—
St CT	This design is based on the 'MK CT' below operating floor but 'St Tap' above and was manufactured by MK. Pitch was 4".	p.38	u1890s - 1910s	—
St 28	This design is based on the 'MK 17' below operating floor but 'St Tap' above and was manufactured by MK. Pitch was 4".	p.39	1910s	—
St Stp	A partially interlocked frame, preventing conflicting signals (worked by stirrups) but with point levers each end of the frame but not connected to it.	p.33	1843 - 1860	—
St Tap	A lever (direct) tappet frame with levers at pitches between 4" and 5¼", the most common being 4⅛".	p.36	c.1870 - c.1928	—
	Sykes & Company			
Sy	An electro-mechanical power frame consisting of an 'LB 1905' frame with miniature slides above to operate signals.	—	c.1900 - nk	—
	Tweedy			
Tw 1873	This frame design (1873 patent) was lever-actuated by a stud driving a link plate, rotating a longitudinal shaft.	p.82	u1873 - u1890	—
Tw Tap	This is a simple direct tappet design at a pitch of 5½".	p.83	u1890 - u1895	—
	Tyer & Company			
Ty DirT	This is a simple direct tappet design at a pitch of 4".	p.84	u1909 - u1930	—
Ty Knee	This frame, manufactured by Tyer and Tweedy, was a lever (direct) tappet design at 5½" pitch.	p.141	c.1890s - c.1940s	BP 001-020
	Webb & Thompson			
WT	An electric power frame developed for the LNWR.	—	from 1898	—
	Westinghouse			
Wh 17A	A minor modification of the 'MK 17' design by Wh. Pitch was 4".	p.71	1940 - 1961	—
Wh A	An electro-pneumatic power frame.	—	1902 - 1903	—
Wh A2	A catch-habdle actuated single tappet locking at 4" pitch.	p.59	1924 - 1949	CM 010-040
Wh A3	Almost identical to the 'Wh A2' frame. Pitch 4".	p.59	1949 - 1977	GW 220-250
Wh B	An electro-pneumatic power frame for Underground railways.	—	1903 - 1920s	—
Wh DW	Double-wire, catch-handle tappet locking.	—	1923 - 1940s	—
Wh GB	Ground frame with electro-pneumatic action.	—	1907	—
Wh K	An electric power frame with mechanical interlocking.	—	1923 - 1928	—
Wh L	An electric power frame with all-electric locking.	—	1929 - 1961	GW 530-140
Wh M1	An electric power frame with mechanical locking, produced by McKenzie, Holland & Westinghouse Power Signalling Company prior to it becoming part of WB&S.	—	nk	GW 106-020
Wh N	An electric power frame with mechanical locking, developed for LPTB.	—	1931 - 1948	GW 003-080
Wh O	An electric power frame developed for use in collieries.	—	1952 - 1955	—
Wh pf	An electric power frame.	—	from 1898	—
Wh US	An electro-pneumatic frame.	—	1899	—

Other abbreviations

Abbrev.	Meaning	Abbrev.	Meaning
(DirT)	direct tappet	E=nn	Frame extended, number of levers and date are also given if known
(DirT5)	5 bar direct tappet	S=nn	Frame reduced or shortened, number of levers and date are also given if known
(3 bar)	3 bar	RS (HT)	A frame originally manufactured by RS now with HT locking
(tappet)	tappet	SF (Dx)	a SF duplex frame, i.e. either 'SF 1888' or 'SF 1905'
(Rack&Tap)	rack & tappet	GW (class 6)	ground frame (GF) class 6
(HT)	horizontal tappet	Spl	frame specially made up for a particular location
(VT)	vertical tappet	2h	second hand

8. Locking frame types (cont'd)

Note - not all variants of a manufacturer's design are listed as separate standard abbreviations. The McKenzie and Holland 1873 patent had six variants, namely nos. 4, 5, 5A, 6, 6A and 8; the 1886 patent had three variants namely nos. 9, 11 and 12 and their cam and tappet design had variants nos. 13 (4" centres) and 14 (5" centres). Such additional information as this is included, where known, in brackets after the standard abbreviation.

Panels, switches and Automatic Route setting equipment (all electric)

In the electronic era, panels of various types have been and are superseding mechanical locking frames. For the panel signal boxes at Birmingham, Bristol, Britannia Crossing, Cardiff, Gloucester, Leamington, Maindee (Newport), Margam, Old Oak Common, Oxford, Plymouth, Port Talbot, Reading, Slough and Swindon, the panel is described by type thus, P(type). Where a panel is installed in an existing signal box with a lever frame, it is often simply referred to as 'panel' (of unspecified type).

A glossary of terms used in this register to describe electric and electronic equipment and installations is given below:

Term	Explanation
P(—)	panel (type)
P(INT)	Henry Williams Integra Domino 'Entrance-Exit' panel
P(ICS)	Individual control switch
P(NX)	Entrance-exit (NX) where a route is selected by selecting the start and end of the route in sequence.
P(OCS)	one control switch
ERTMS	European Railway Traffic Management System
SSI	Solid state interlocking
WS	work station
VDU	Visual display unit
panel	unspecified panel
IECC	integrated electronic control centre
SC	signalling centre
P(IFS)	Individual Function Switch(es)
P(PB)	Push Button; various types, mainly shunting yards
RETB	RETB; uses radio transmission with VDUs
TBS	Transmission based signalling (no lineside signals)