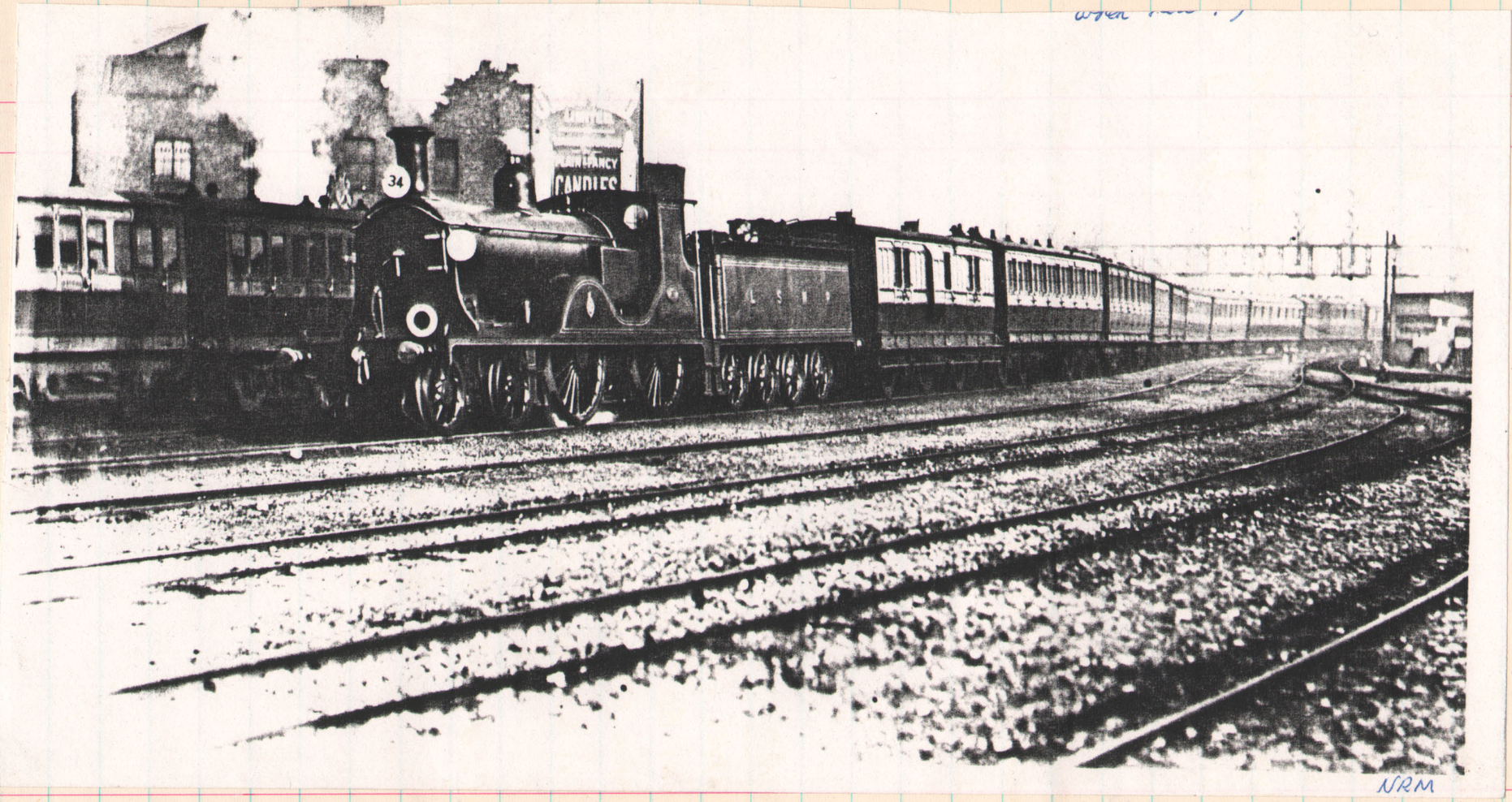


Waterloo 1900, Portsmouth train behind new T9 Class. Heavy over-sleeper ballasting
(discontinued c. 1905)

JOSEPH FIRBANK

Born Durham 1819. Worked in pits 1826. First contract (sub) Woodhead Tunnel. Married Melton Mowbray 1849. Son: Joseph Thomas Firbank (later 'Sir' 1899 d. 1910). Worked on own from 1840s. Association with LBSCR. M.R. Kentish Town - Brent Viaduct (excl). Metropolitan Extension (Harrow) 1880, then Aylesbury. Survived crash of 1866 (except MR shares). Assisted by son, and nephew (Ralph). Settle & Carlisle Line. GNR widening in London. Bournemouth Direct Line; died during this contract 1887. (Was involved in unsuccessful promotion of Holsworthy & Bude railway 1883, which was abandoned in 1892). Son, Joseph: Marylebone, Goods/Tunnels.

LUCAS & AIRD

1860s: Charles Lucas, Alfred Lucas, Thomas Lucas.

1870s Lucas Bros. (public & general): Liverpool St & Hotel 1870
London Chatham & Dover Railway (after Peto)
Lucas & Aird: Tilbury Docks, Hull & Barnsley, etc.

(John Aird. d. 1911) West Highland (Craigendoran - F. William)
Egyptian dams & rlys (1900s)
Avonmouth Royal Edward Dock.

RELAYING BY HAND

Rails not always delivered as 'specials' for curves. Curves laid until 2¼" lead on outside rail. (once it was 4½").
Rails laid in Sixfoot for relaying – dropped off from bolster wagons

Sleepers (Baltic redwood (30 year life) or Douglas Fir (15 years) dropped off from wagons and laid offset to sites.

"Lumping" ¾ mile with 45 men. full day (or night) work.
(i) Knock out keys "Drive out"
(ii) Remove fishplates "Take off")
(iii) Rails to sleeper ends "Turn out"
(iv) Collect fishplates and bolts
(v) Stack old sleepers.
(vi) Pick out old beds "Picking")
(vii) Lay new (chaired) sleepers in line
(viii) Rails bumped to shake off dirt.
(ix) Rails tipped in
(x) Expansion bits
(xi) New keys and fishbolts/plates
(xii) Keying in (bar & hammer) "Drive in"
(xiii) Hopper train –
(xiv) Shovel pack (top)
(xv) Alignment (bars)
(xvi) Tighten fishbolts
(xvii) Hopper train (plough?)

Tools: Spanners, bars, sleeper tongs, rail tongs, keying hammer.

LNWR Permanent Way.

30'0" panels 10 to length (11 on sharp curves) up to 1894

3'0⅛" spacings; 1'2⅛" (2'4") at joints) Rails 2¾" heads (90lb)
2 9/16 " (80lb)

Hexagonal nuts until 1890 – then square (1905)

New FPs for 60' were identical outdivided inside. Bolts with heads to suit

Keys 6" compressed English oak

Sleepers: machine bored – adzed on top side to depth. 32lbs creosote

Zelt pad ¼" thickness

Chairs: 14⅜" x 7¾" 45lb (intermediate) 14⅜" x 9¾" at joints

Bolt Holes (30') 4½" inner 1" bolts / 1⅜" square heads

~~The~~ Fishplates 1'8" x ~~3⅛~~ (curved under – 5¼ deep)

LNWR used iron, later steel screws. Each chair 2 spikes / 2 screws UNIQUE

Screws 6½" tapered, Spikes 6" x 13/16" arranged diagonally

Ferrules for each

60' Rails 1'6" fishplates (4½ x 5 x 4½" holes)

Ballast:- Broken Clay furnace slag (iron prepared – the toxic content discouraged weeds, did not crumble to dust)

Then broken granite.

Platelayers transition: 1" in 30' > 1" in 120' to superelevation.

Weeding

Riddling

Lifting: Ganger could impose speed restriction (temporary) while lifting

Gauging: plugging and reboring

Rail adjusting – creep (also in crossings)

London & Brighton Railway

Gauge 4' 9" ("sufficient play for the wheels and now far more usual than 4'8½" ")

Interval 6' 5" Side 2' 9"

Rails 15'0" 76lb/yard Chairs 10¼" X 5½" (joint) 2 + 1 holes
10¼ X 4¾" (intermediate) (Spiked)

Cross-sleepers, or stone blocks (felted) at 3' 9" spacings

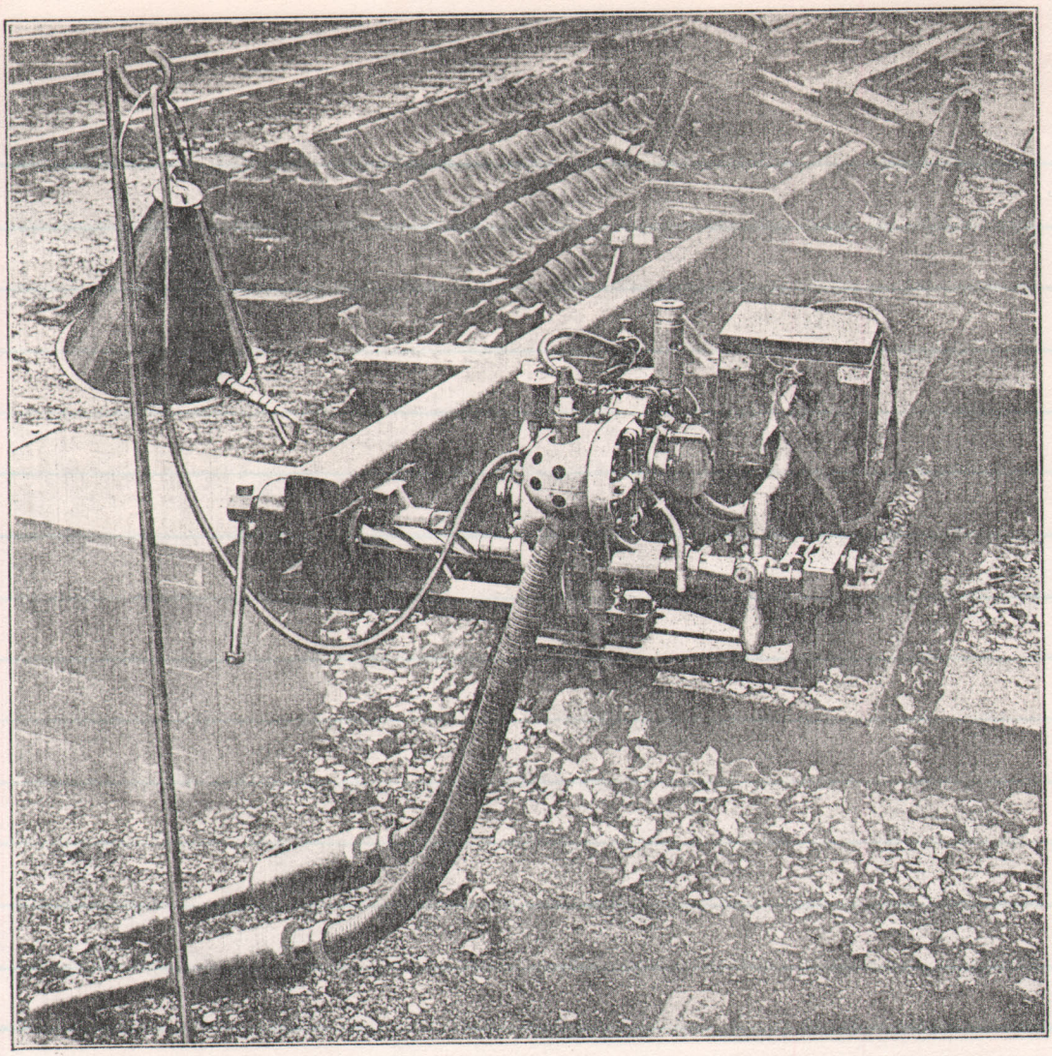
Keys 6" X 2⅜" X 1⅝" (joints) 4¾" X 2⅜" X 1⅝" (ordinary)

(NB Wilshaw "recommended" 2'9" spacings at joints#
3' 2" otherwise over 15' length
NB supported joints then (not suspended)

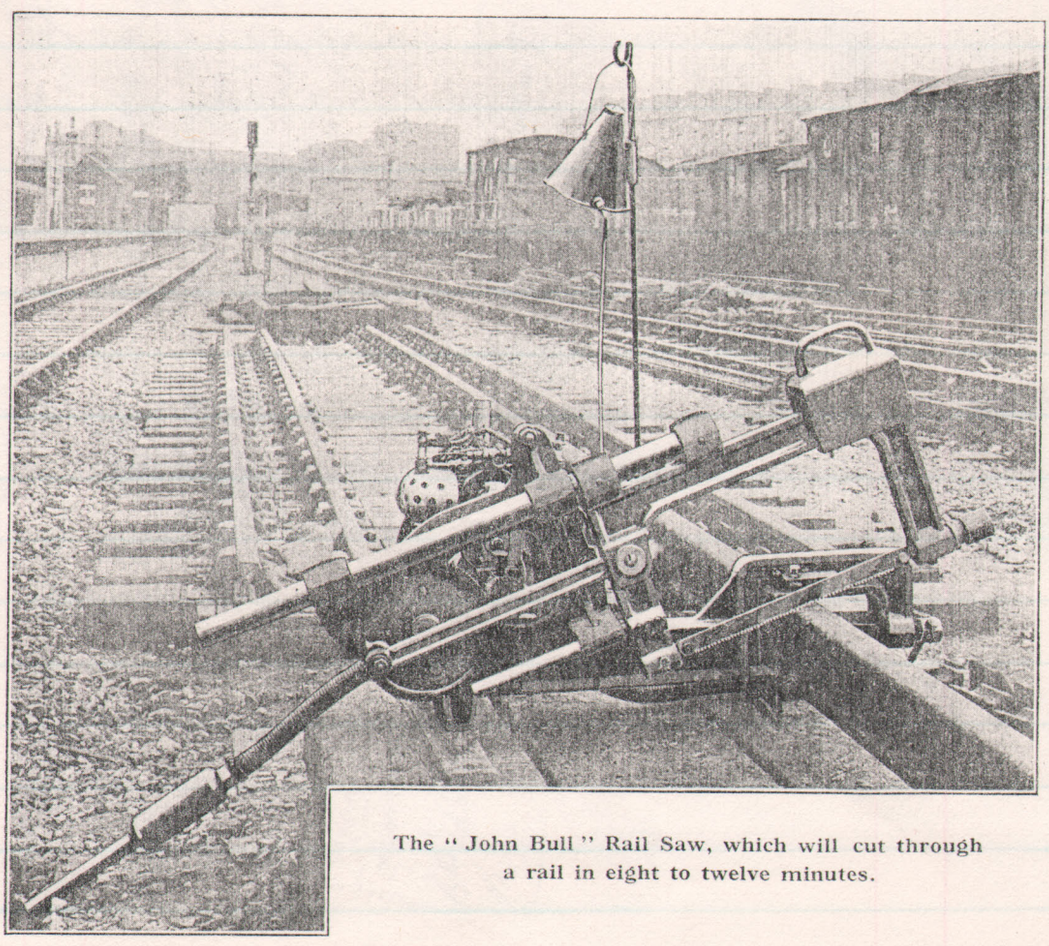
London & Greenwich (cont from p. 30)

The first rails, L.Br to Deptford were ⊥ section (cf "parallel" mentioned before). *Head 1¼" (4'-11" outer – (2 X 1¼ = 2½) = 4' 8½"), Cast iron chairs 9" x 4½", wedges, 4" iron spikes - oak plugs (treenails) + felt pads. Breakages occured (manufacturing or 'welding' of the iron) considerable defects. Deptford-Greenwich had heavier - reversible rails of 85lb (!), laid on 12" X 12" long timbers, 10" X 6" cross sleepers on top at 4'0" centres, iron tie gauges, ballast depth 2'0"
Some bridge rails on part ~~- on 12" X 12" long timbers spiketed~~
* L&G Act provided for 2¼" heads.

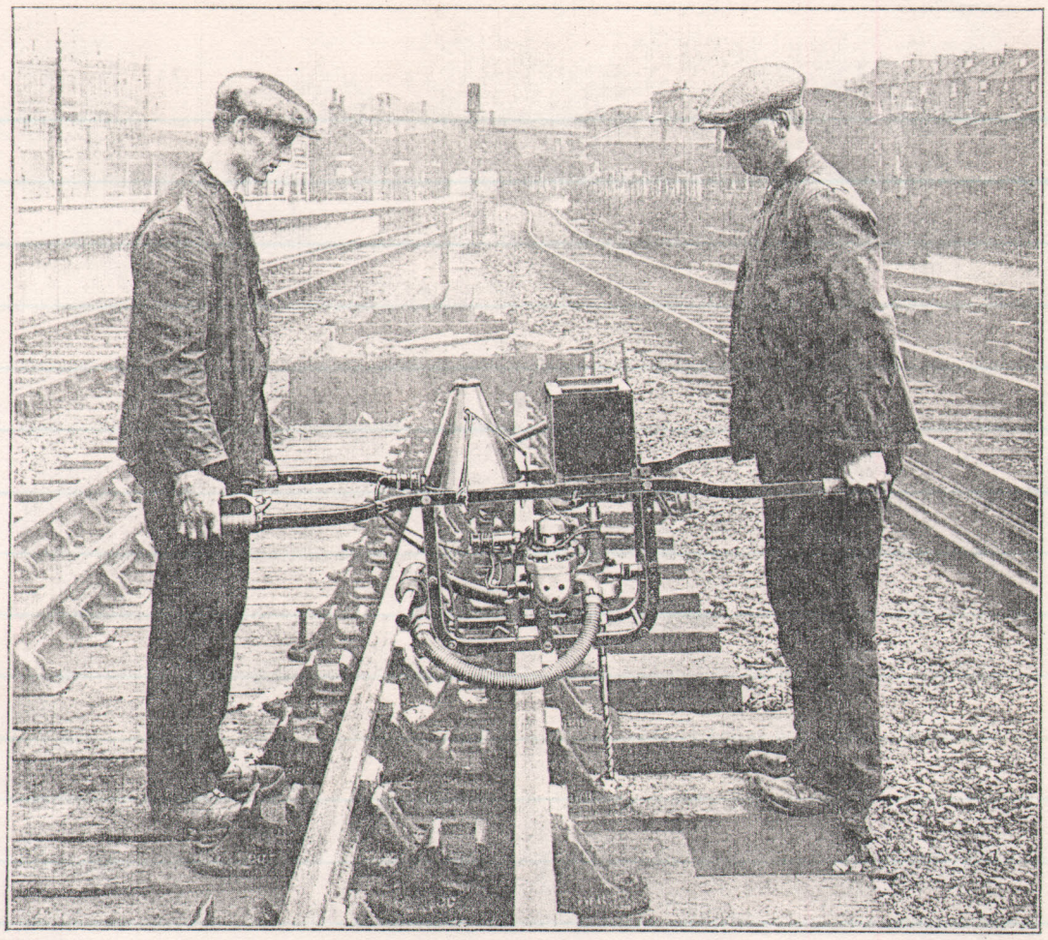
Point used at Greenwich were patent ones invented by Charles Fox engineer to the L&BR. They were rather similar to modern points '... whereby the whole of the main line may remain a fixed line' (previously LGR used Curtiss's switches



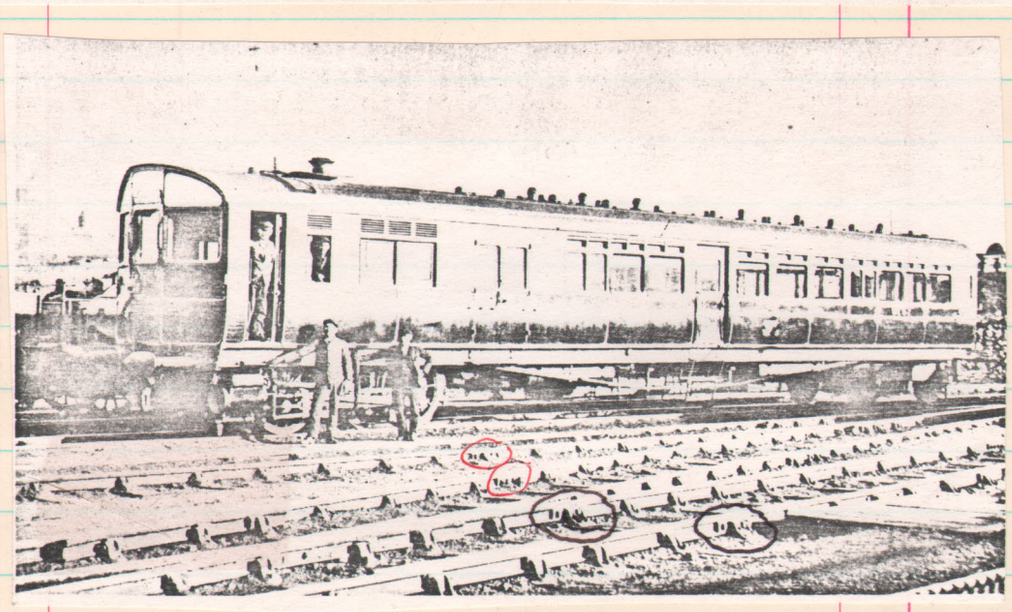
The " John Bull " Rail Drill by which a hole can be drilled through a rail of the permanent way in two minutes.



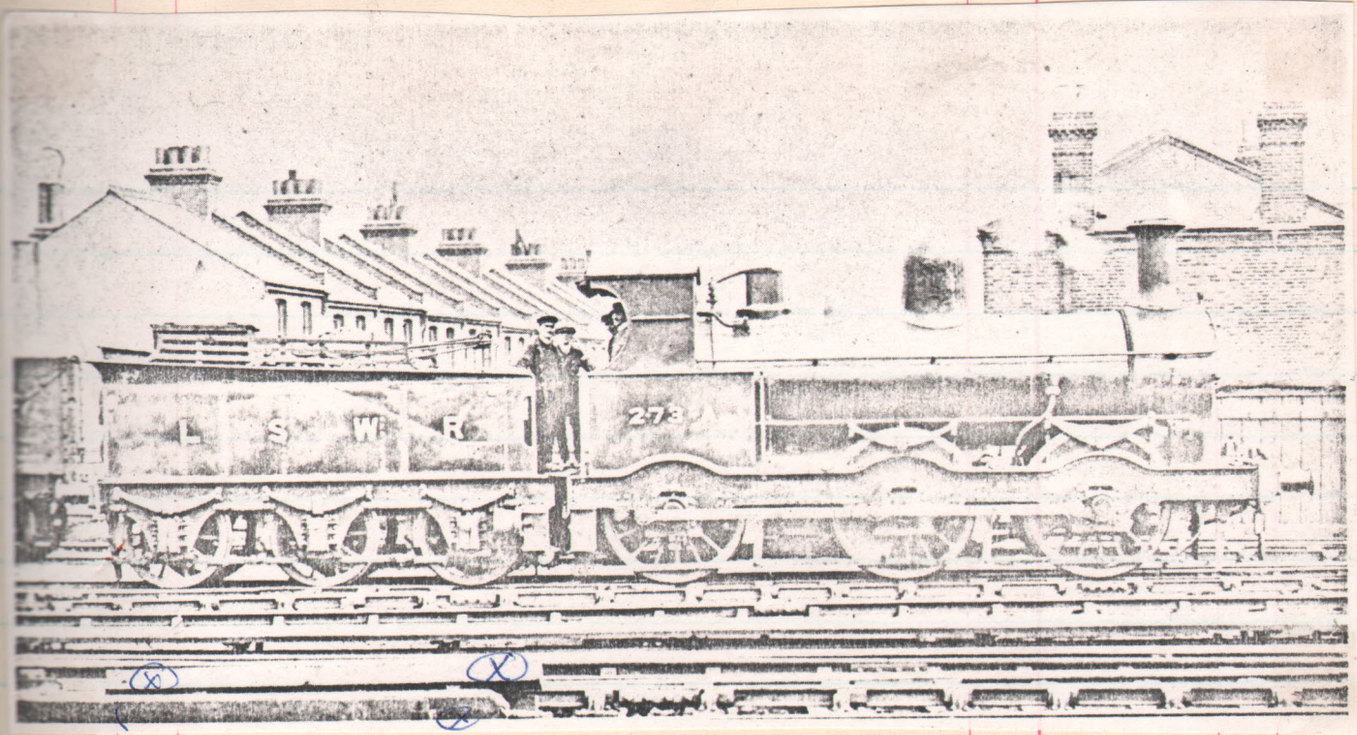
The " John Bull " Rail Saw, which will cut through a rail in eight to twelve minutes.



The " John Bull " Sleeper Borer, by which the boring of a sleeper is done in ten seconds.

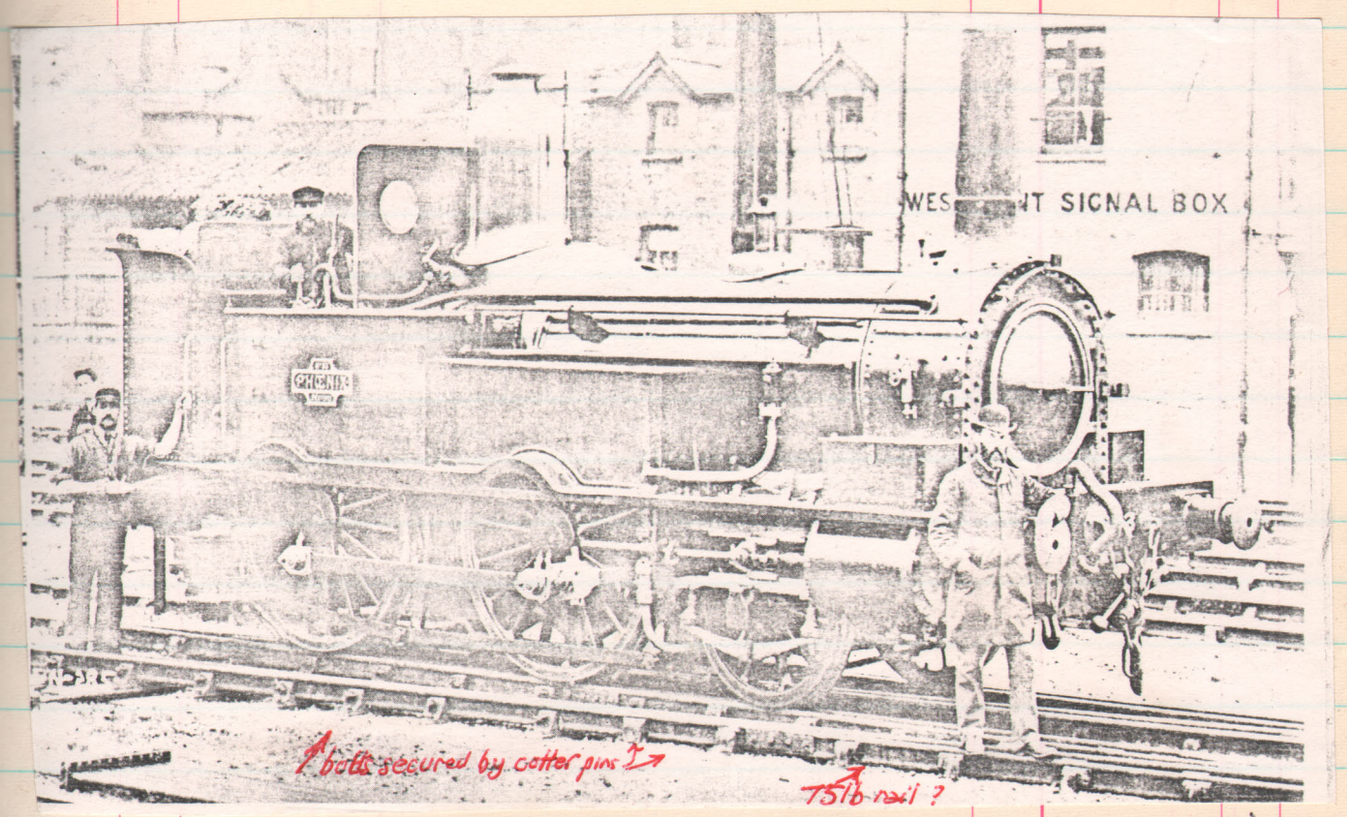


Weymouth Engine Shed. GWR Rail Motor. Note supported joints (BL. Jackson)



Beyer Peacock Double Framed 0-6-0 No 273 (Built June 1872; Withdrawn ~~1923~~ 1924/ (273A from 9/1917). Seen here at Wimbledon in 1921 (Strawberry Hill depot engine)

NOTE large guard boards for conductor rail Ⓧ - Ⓧ



Standard Beattie 2-4-0WT No 33 "PHOENIX" at Wimbledon (1872-1890) c1882.

TWO RAILWAY SYSTEMS ~~1850~~ 1872

Early view of LSWR train; engine "Tartar" Class No. 13 "Orton" as rebuilt in 1852. Scene is thought to be at Basingstoke.*
LSW track obscure in original but foreground shows G.W.R. bridge rail on long timbers (the "baulk road") and is mixed gauge (4' 8½" and 7' 0¼")

LSWR engines were either 2-2-2s as above, 0-6-0s, and, to suit the Salisbury (and later to Exeter) 2-4-0s were appearing. These lightweight engines and rolling stock were not too punishing on the 15' and 21' wrought iron rails (even a few cast irons were about). There was increasing trouble with joints, however, which led to the development of the fishplated versions. At first with joint chairs support, but later 'suspended' as known today. Ballast was gravel or broken stone, well heaped up to the rails and covering the sleepers.

The 'baulk road' although appearing fortified and in fact a much steadier assembly, needed constant retimbering and attention to alignment. Keeping gauge was difficult with both forms. The adoption of the 4' 8½" guage by the GWR gave the death knell to the long timbered road. The cross-timbered, Stephenson railway improved considerably over the years, particularly following the introduction of the steel rail in the 1860s.
Chard Junction May 1872. LSW track also appears to be bridge rail – or perhaps Vignoles?

Correction note by oldpway, May 2022:
This view is actually of Chard Joint Station, which was later known as Chard Central.
It is taken from the south end looking northwards.
L&SWR bay on the left.
GWR through platform on the right.
Thanks to Chris Osment, West Country Railway Archives, www.railwest.org.uk, for this information.

There are signs of "wide" 6-foots and there is room for 2 x 7'0"s under some overbridges.

History of L.S.W.R. R.A. Williams, Staines

..... while at the Dorchester junction with the broad-gauge Wilts, Somerset, and Weymouth the company was to provide facilities for interchange of traffic and 'to provide and lay down upon any part, not exceeding eight miles of the Southampton & Dorchester Railway adjacent to Dorchester, additional rails.... to enable engines and carriages constructed for the gauge of the said W.S.&.W Rly to pass along such part of the Southampton & Dorchester'

This strange section meant the mixed gauge ending abruptly in mid-country eight miles East of Dorchester, probably only to balance Board of Trade power, under Section 29, to require mixed gauge on the W.S.&W. Between Dorchester and Weymouth.

136-15 (D. Jn)
− 8.00
128-15 (East of Morton)