Joseph Dodds and Robert Leslie – a mystery solved and an interesting discovery made

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The Harris Collection at Belmont contains an unusual, ebonised balloon clock with moon-phase indication on top (Fig. 1) signed on the movement Joseph Dodds London, but 'L. Dodds, London, BY THE KINGS PATENT' on the white-painted dial. As no patents are recorded in the name of Dodds (either J or L), the clock's signatures remained a mystery until a two-part article by Rich Newman in the NAWCC Watch & Clock Bulletin provided the solution. Dodds went into an unofficial partnership with American watchmaker Robert Leslie who shared his patents with Dodds. There the story would have ended, but for the discovery of a watch movement signed by Dodds (Fig. 2) in the collection of the Russell-Cotes Art Gallery & Museum in Bournemouth, prompting a closer look at the Dodds and Leslie business, a few of its known products and the watch patents themselves.

The extraordinary story of the horological career of Robert Leslie (c.1765–1803) is excellently and comprehensively told by Rich Newman,[1] and will only be briefly summarised here, where relevant to the London part of his story.

Joseph Dodds

Less is known about Dodds, though it is certain he is *Joseph* Dodds (c.1759–1817) and that he was primarily a goldsmith and jeweller, based in Aldersgate Street, London at the turn of the century, and retailing watches and clocks made by others. The authority on London goldsmiths, Arthur G. Grimwade, suggests he was the Joseph Dodds apprenticed to jeweller and goldsmith Matthew Derbyshire of Kingston-upon-Hull for seven years on 17 July 1773 on payment of £42.[2] If apprenticed at the usual age of fourteen, Dodds would thus have been born about 1759, and if this was the same man, which under the circumstances seems plausible, then Joseph Dodds would have been out of his apprenticeship in 1780. It is equally plausible he made his way to London at this point to further his fortune, which is when one begins to find early references to Dodds in the city. In the records of trade clock and watchmakers A. Thwaites in London, there is a reference to cleaning a watch for a Mr Dodd in London that year, and later Thwaites references to 'Mr Dodd' are certainly to Joseph.[3]

On 27 October 1787 Joseph Dodds was witness to the will of goldsmith and jeweller John Troutbeck at Troutbeck's business address of 12 Aldersgate Street in the City (Fig. 3), just around the corner from Goldsmiths' Hall. Troutbeck had become a

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1. Rich Newman 'Robert Leslie, The Greatest American Watch and Clock Maker Ever Forgotten (Parts 1 and 2)', *NAWCC Watch & Clock Bulletin*, Vol 60/Issue 1 and 2 (Jan/Feb and Mar/April 2018), 69–88 and 149–163.

2 Arthur G. Grimwade, *London Goldsmiths 1697–1837: Their Marks & Lives,* 3rd Edition (London: Faber & Faber, 1990), p. 493 and p. 747.

3. A. Thwaites day books, 15 July 1780.

Fig. 1. The ebonised balloon clock at Belmont, Inventory ref: FAVBT/C/49. It is signed on the dial 'L.DODDS London BY THE KING'S PATENT' (Harris (Belmont) Charity).

Freeman of the Goldsmiths' Company in December 1785 and had evidently not been in business long. Aldersgate Street ran north up to Clerkenwell and was populated by a large number of goldsmiths and clock and watchmakers. By that date Dodds was probably working for Troutbeck, as they would soon establish a partnership at the Aldersgate Street address. In 1789 and 1790 Dodds registered his own sponsor's marks at Goldsmiths' Hall, as a Plate Worker and then a Small Worker, respectively ('[I.D]' in cameo). Troutbeck's drafting of his will and his taking Dodds into partnership at this time may have been inspired by Troutbeck's declining health, as five years later, on 7 November 1792, his will was proved. The will reveals Troutbeck was a wealthy man with properties in his home county of Cumberland; he was a member and Steward of The Cumberland

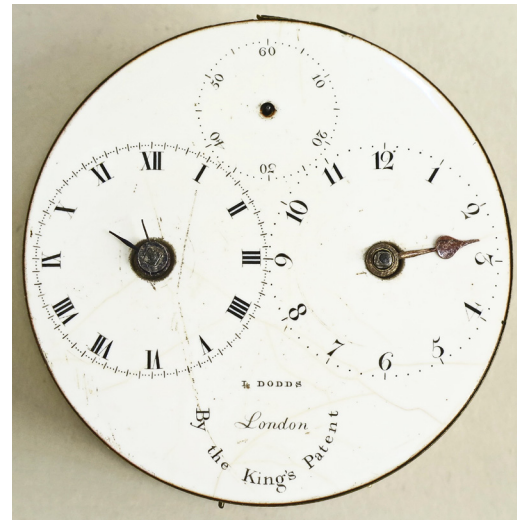


Fig. 2. The dial of 'Nautical Watch' movement with Leslie's constant force escapement, in the Russell-Cotes Art Gallery & Museum, Accession Number: 869.67.3 (Dale Sardeson).

Society in London at that time.[4] So, although the partnership was formally dissolved on Troutbeck's death, the business which Dodds continued at Aldersgate Street would seem to have been financially secure at the time.

Now in business on his own account in Aldersgate Street, and trading in competition with many other goldsmiths and watchmakers, it seems Joseph Dodds sought to widen his market, and in the spring of 1793, he took on the American watchmaker and inventor Robert Leslie, lately over from Philadelphia.

Robert Leslie

Leslie was a highly significant figure in eighteenth-century American horology, described by Newman as 'One of the most important and impactful makers in American history.'[5] From a longstanding Maryland family, originally of Scottish descent, Leslie was born about 1765 in the house his ancestors had bought in 1658. As a young man he taught himself the elements of the clock and watch trade, then working briefly for the gilder and watchmaker Thomas Morgan in Philadelphia before opening his own business in that city in 1787, advertising

4. St. James Chronicle or British Evening Post, 'meeting at the Crown and Anchor Tavern on the Strand' 13 April 1790.

5. Newman, 'Robert Leslie, Part 1', 70.

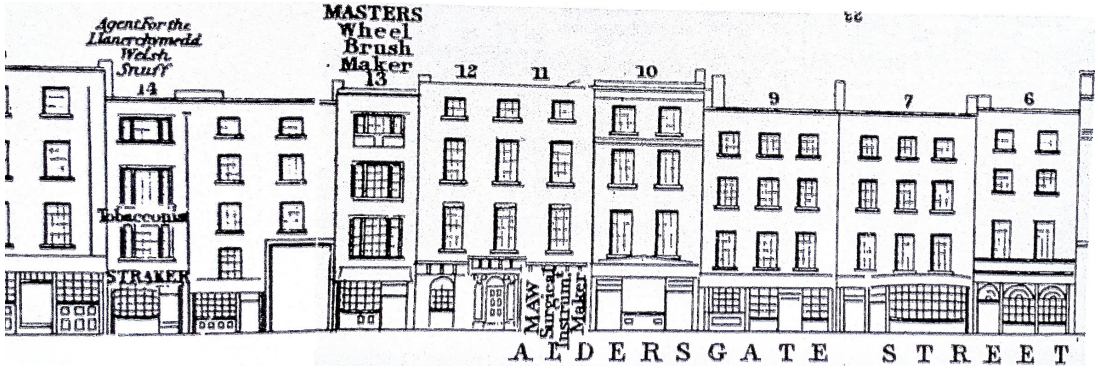


Fig. 3. Aldersgate Street from Tallis's *London Street Views* (1838-40). Between 1789 and 1809, Dodds was at No. 12, which was probably the same building as in this view (London Topographical Society).

his services and several new improvements in watch and clockwork. In 1789, after petitioning the Commonwealth of Pennsylvania, Leslie was granted 'protection' for eight horological inventions, including escapements for both clocks and watches. The first US Patent Bill was passed in 1790 and of the 55 original federal patents, five were Leslie's, granted in 1793.[6]

In addition to his watch and clockwork, Leslie was intensely interested in other new technologies, making models of inventions for the Philadelphia scientific community. His involvement in advancing scientific endeavours in the US brought him into contact with some of the most celebrated Americans of the day, including George Washington, Thomas Jefferson, Benjamin Franklin and many other important figures of which much more can be learned in the NAWCC articles by Newman.

An unfortunate result of his ambitious advertising and much-publicised patents was that the established horological community in Philadelphia began to resent his presence in the city trade and, on the pretext of his having no formal apprenticeship or training, in 1790 began moves to block his access to materials and stock, and to prevent him from taking on staff or apprentices. One member of the Philadelphia horological trade, Isaac Price, refused to join this anti-Leslie 'horological Mafia', and consequently also had his trade blocked. Refusing to be forced out, Leslie and Price then decided to work in tandem, and to broaden their sources of supply well beyond the city. With the help of Leslie's influential government contacts, by the end of 1791 Leslie and Price had established contacts in London and were importing materials and stock from England, advertising this in direct competition with their opponents.

Another plan of Leslie's at this time, supported by Jefferson as Secretary of State, to import French watchmakers to assist in the business, seems to have failed, almost certainly owing to the upheavals of the Revolution raging in France at the time. And so it was that in November 1792 Leslie and Price formally announced their partnership in Philadelphia, along with a new plan to situate Leslie in London, as agent for the new company, whilst also attempting to form a separate partnership in the British capital. While they had not been the first to import horological goods and materials from Europe, the concept that one of the American partners would reside on the other side of the Atlantic and act as agent – cutting out the middle-man – was new.

Leslie & Dodds

Armed with several letters of introduction signed by Jefferson, Leslie arrived in London on 9 June 1793. Within a month of his arrival, writing to Jefferson and others, he stated that

6. Sadly, almost all of America's early patent records were destroyed in a Patent Office fire in 1836, so details of these early 'protections' and patents are not extant, though his British patents, described later in this article, are probably similar.

he had placed orders for a variety of watches for export and sale under the names Leslie & Price in Philadelphia.[7] A number of London-made silver pocket watches with plain verge escapement, signed 'Leslie and Price, Philadelphia', survive today in testament to Leslie's purchases over the period he was resident in London,[8] and there exists an interesting and highly decorative London-made watch movement of unusual caliper, signed by Leslie and made during this time.[9]

Leslie met a wide range of people in the London trade but, most importantly in his letter to Jefferson was his news that he had already found a supporter, Joseph Dodds:

> I find my improvements much better received here than I expected, so much so, that several of the most eminent watch and Clock makers, have offered to be at all expense of getting patents here, and allow me half of all the profits, which I should have thought very advantageous proposals, if better had not offered, as the patents will cost one hundred guineas each, but I have now agreed with one who is very largely in business, he is to be at all the expense of the patents, and furnish any sum of money I wish, under fifteen thousands pounds, to work on, so that I shall have one half of all the profits, and not be under the necessity of using any of my own money, this is a contract by which I cannot lose, and may perhaps gain something handsome. [-] … the gentleman I am connected with, has given me the entire direction (of) the business, and wishes to indulge me with every experiment I choose to make at his expense.[10]

Evidently wishing to improve the quality and interest of his horological stock, Dodds was apparently prepared to support the ambitious American with exceedingly generous terms. However, the maximum figure of £15,000 on offer seems doubtful – it was an enormous amount, perhaps over £1m in today's money, and whether the 'contract' was quite as open-ended as Leslie suggests is uncertain. It seems he was not being taken on as a partner in the business, only being given space at Aldersgate Street to develop his plans and create or commission new watches and clocks to his designs, some for sale in the shop under Dodds' name and some exported to the US for Leslie & Price. But Leslie was evidently a convincing communicator and was able to excite real support for his proposals. So, true to his word, Dodds provided Leslie with the necessary funds and things moved ahead quickly.

Leslie's patents

By December that year, Leslie had been granted a range of twelve British horological patents, all described in detail elsewhere.[11] Briefly, these comprised: 1. A design for a torsion 'pendulum'; 2. A 'rolling pendulum' in which a cylindrical 'bob' rolls to and fro on parallel wires; 3. A form of rise and fall regulation for pendulum clocks which he claims incorporates temperature compensation, though this is fallacious; 4. A form of spring-pallet, constant-force escapement for pendulum clocks; 5. A form of constant-force escapement for watches; 6. A simplified form of count-wheel striking in which an oscillating balance with a form of duplex escapement controls the rate of striking; 7. A different form of repeating work for clocks; 8. A design for a dual-time dial for a 'nautical watch', incorporating a tidal dial and/or calendar, as required; 9. A form of detached, constant-force escapement in which the balance is impulsed through the balance spring; 10. A different form of repeating work for watches; 11. A crude form of mainspring in which a double-ended, thick curved spring steel arm in the edge of the

7. Newman, 'Robert Leslie, Part 1', 77–82.

8. Newman, 'Robert Leslie, Part 1', 78–79.

9. Robert Leslie No. 1651, watch movement in David Penney's Antique Watch Store Archives. (www.antiquewatchstore.com)

10. Letter from Robert Leslie to Thomas Jefferson dated 26 September 1793, cited in: Newman 'Robert Leslie, Part 1', 80.

11. Newman, 'Robert Leslie Part, 2', 150–156.

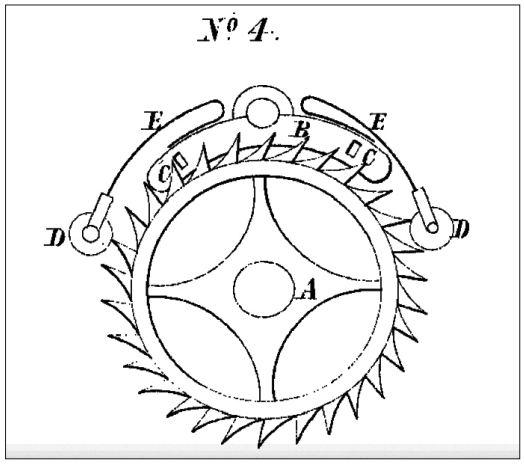


Fig. 4. Leslie's constant-force clock escapement (Patent No. 4), employing impulsing springs mounted on the pallet frame, with rollers acting on the escape wheel teeth (Rich Newman).

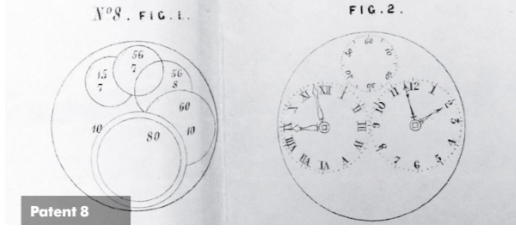


Fig. 5. Patent No.8. Leslie's design for the dual dial of the Nautical Watch (Rich Newman).

case is 'wound' by bending slightly, the great force then delivered being de-multiplied by a lever with toothed rack acting on a pinion on the other side of the movement; and 12. A form of keyless winding whereby the pendant is pushed in and pulled out, the clicks being on an extension to the pendant, under the dial, acting on the ratchet.

The group makes a fascinating collection of the ingenious, the quaintly impractical and the bizarre. The constant-force escapement for clocks in No. 4 (Fig. 4) ought to work well, though the authors are unaware of any examples having been made. The design for push-pull keyless winding was ingenious, though not the first of this type. Celebrated London chronometer maker John Arnold (1736-1799) had created such a watch in about 1766. An example, marked 'John Arnold

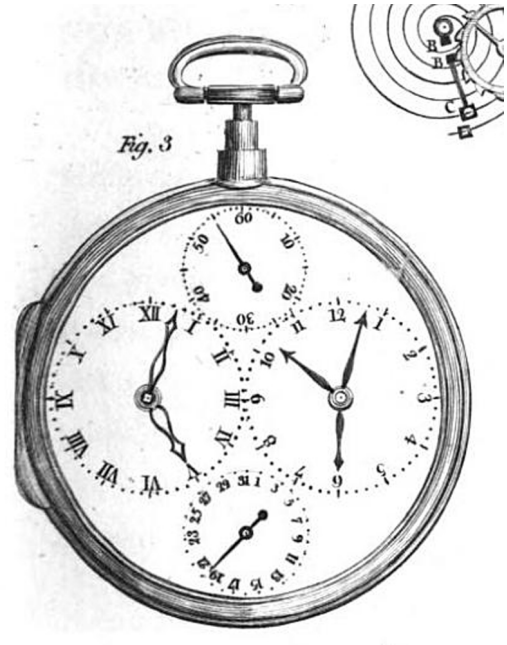


Fig. 6. Leslie's Nautical Watch as depicted in the *Repertory of Arts and Manufactures* (Rich Newman).

Invenit London No.1' is in the Patek Philippe Museum.[12]

The Repertory of Arts and Manufactures

Getting himself noticed in London's technological world, in 1794 and 1795 Leslie submitted several articles for publication in the newly launched *Repertory of Arts and Manufactures* in London. The first was his proposal for a universal standard based on the length of the seconds pendulum, in fact the reciprocal of a very well-established concept in which the different lengths of a seconds pendulum in different latitudes could provide the changing value of gravity and enable the determination of the shape of the Earth. Leslie recognises this phenomenon and simply states that the standard measure would have to be agreed as taken at a specific place.

Following a description of an improved tide wheel acting in both directions of tidal flow, in 1795 he published a description of a 'short pendulum', really a torsion balance, along with a description of his 'Nautical Watch' incorporating two of his patents.

12. Catalogue: Peter Friess, *Patek Philippe Museum, Volume IV, The Emergence of the Portable Watch* (Geneva: Patek Philippe Museum, 2015), p. 608.

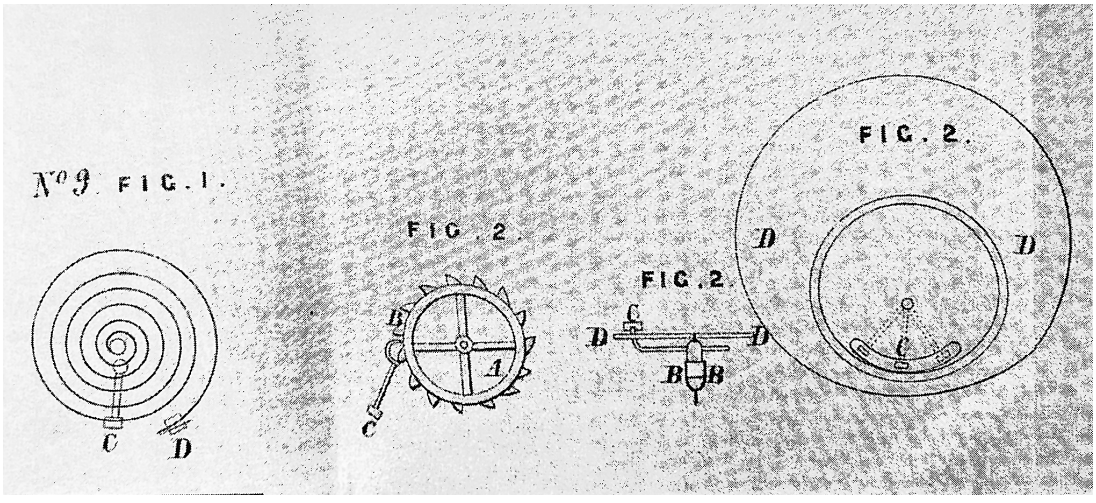


Fig. 7. Leslie's constant-force watch escapement impulsing through the balance spring. The precursor to later free balance and free pendulum designs, including those of Riefler a century later (Rich Newman).

The Nautical Watch

In fact, the real interest and value in his group of patents is in the concept of the 'Nautical Watch', to which the dual time dials (Patent No. 8, see Figs 5 and 6) and the constant force escapement (Patent No. 9, see Fig. 7) appear to have been associated.[13]

The dual-time dials naturally provide time at two different longitudes, the idea being that one is maintained on the time of the home meridian and the other on the local time at sea, the difference on the dials of the nautical watch translating directly (each 4 mins = 1 degree) into one's longitudinal position from the home meridian. The second dial is driven by having a second intermediate pinion meshing with the going barrel, but not forming part of the train. This means the second dial will have some shake in the minute hand if the pinion is not closely pitched with the barrel teeth. The ingenious escapement, discussed later in this article, was obviously regarded by Leslie as qualifying the watch as a marine timekeeper – a *chronometer*, as the instrument was beginning to be termed.

This design was duly put into production, and Leslie reported to Jefferson in January 1794 that four watches 'for the use of navigation' with the escapement as in Patent No. 9 were finished and 'were engaged by the first four Sea Captains that saw them.'[14] At least three examples of watches made to Leslie's specification, in one form or another, are known to have survived to this day. Two are illustrated by Newman,[15] both with duplex escapements. One is a kind of boxed prototype movement marked 'No. 5 Leslie's Patent' but engraved with a plate on the movement for 'Brearley, Philadelphia', and evidently for sending to the US by Leslie as a kind of marketing model. The second, which does not have the dual-time dials, is signed within the piercing on the balance bridge 'Joseph Dodds London' and is engraved on the potence plate: 'BY THE KING'S PATENT, No. 5'. As both watches bear this number it is likely this is not a serial number but relates to the patents in some way. The third is the watch movement in the Russell-Cotes Art Gallery & Museum in Bournemouth (Figs 2 and 8).

All three are basically of the same slim, going barrel calibre with the balance under a bridge, and the evidence suggests that Leslie sourced the basic unfinished movements as *ébauches* from Switzerland, having them made to his specification and then finishing

13. The keyless winding patent was not associated with the Nautical Watch as that requires the winding at the pendant, and the Nautical Watch design has the movement arranged with the seconds at the top.

14. Letter from Robert Leslie to Thomas Jefferson dated 22 January 1794, cited in: Newman 'Robert Leslie, Part 1', 84.

15. Newman, 'Robert Leslie, Part 2', 157–159.

Fig. 8. The upper plate of the Russell-Cotes movement. The balance bridge is signed by Joseph Dodds in the piercing (Dale Sardeson)

them in London. Many London makers routinely bought in from outside, in addition to using London and Lancashire-made rough movements, depending on the price and

Figs 9, 10 and 11. Fine gold enamel-cased watch retailed by Dodds, c.1795, with movement of Swiss origin and case produced in London by Gaspard Richard (Dr Crott Auctioneers).

requirements of the movement. For example, two finely cased gold watches retailed by Joseph Dodds in the 1790s are both basically of Swiss origin. One (Figs 9, 10 and 11) c.1795 in a gold and enamel case,[16] was probably imported as a Swiss-finished movement and cased in London, the gold and enamelled case made by Gaspard Richard,[17] and another (Figs12 and 13 on following page) with virgule escapement, is believed to have been produced entirely in Switzerland by Jaquet-Droz for Dodds.[18] It is likely therefore that Dodds introduced Leslie to his Swiss contacts in both Switzerland and London.

16. Watch sold by Crott, 94th sale, 12 November 2016, lot 132.

17. Gaspard Richard is recorded as a watchcase maker registering two incuse marks GR, in February and March 1794, at 3 Great St. Andrew Street, Seven Dials, London. (See Grimwade, *London Goldsmiths,* p. 296).

18. Watch sold by Crott 87th sale, 11 May 2013, lot 447.

Figs 12 and 13. Slim, gold-cased Lepine calibre watch with virgule escapement, retailed by Dodds, c.1795, probably wholly manufactured by Jaquet Droz in Switzerland (Dr Crott Auctioneers).

The Russell-Cotes movement

The Russell-Cotes example (Figs 2, 8 and 14-17), which is sadly now only a movement,[19] is particularly important as it is the only example known which contains Leslie's patent watch escapement (Patent No. 9), impulsing the balance through the balance spring. Scratched on the brass edge is: 'No. 1' and it could be that this was in fact the first watch of this type to have been made. As with the second watch shown by Newman, the movement has a finely engraved and pierced balance bridge signed in the piercing: 'Joseph Dodds, London' and the upper plate (the movement employs no potence) is engraved: 'BY the KING'S PATENT', the dual dial being similarly signed.

The escapement

The *Repertory of Arts…* describes the escapement patent as 'a method of giving motion to the balance without any friction',[20] and goes on to say that the patent can be applied to any escapement, though in practice this would be very difficult with any other than a cylinder. The principal invention here is the concept of impulsing the balance through the balance spring, thus detaching the balance from direct contact with the escapement. An arm is 'fastened on one end

19. The movement was bequeathed to the The Russell-Cotes Art Gallery & Museum in 1967 by Alderman A.C Meader, a local councillor who sat on the relevant Bournemouth Borough Council Committee and was consequently heavily involved in the museum. His family owned a chain of pawnbrokers' shops in the area, and many objects that came into them were subsequently donated to the museum. These included many watches and watch movements which were most likely separated from their cases in order for the valuable case material to be recycled.

20. 'Description of a short Pendulum to vibrate Seconds; and of a Nautical Watch. Extracted from the Specification of a Patent granted to Mr. Robert Leslie, No. 13, Aldersgate-street, London; for sundry Improvements in Clocks and Watches.' *The repertory of arts and manufactures: consisting of original communications, specifications of patent inventions, and selections of useful practical papers from the transactions of the Philosophical Societies of All Nations, &c.* Vol. II. (December 1795), p. 95.

Fig. 14. 'No.1' scratched on the brass edge. Was this Leslie's first example of the Nautical Watch? (Dale Sardeson)

Fig. 15. The train of the Russell-Cotes movement showing the going barrel and cylinder escape wheel. (Dale Sardeson)

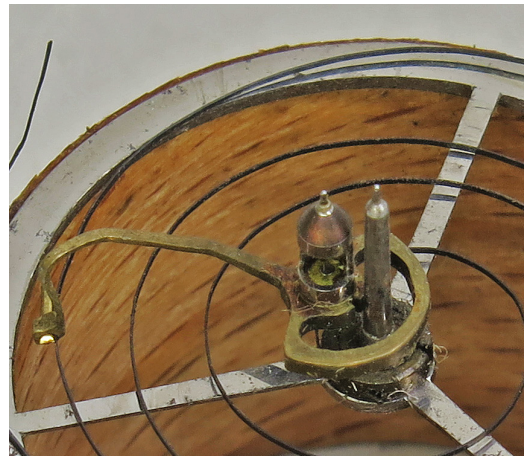


Fig. 16. The cylinder mounted alongside the balance staff, but only connected to the balance via the brass arm, impulsing through the balance spring. The photo was taken before conservation cleaning. (Dale Sardeson)

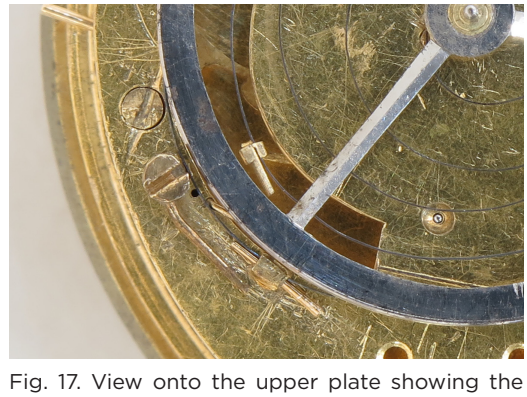


Fig. 17. View onto the upper plate showing the brass arm pinned to the last turn of the balance spring and the brass regulating screw with brass pin, on the left - should be turned through 180 degrees to act alongside the outer turn of the balance spring. (Dale Sardeson)

of the [escapement], passing through a hole cut through the frame' and fixed at the other end to the balance spring 'at a distance of about one turn from its outward end'. In the case of the Russell-Cotes watch the escapement is a cylinder (See Figs 15 and 16), and as the cylinder is impulsed by the escape wheel, its motion is communicated to the balance spring by the arm (Fig. 17). Leslie states that

> though the motion of the [arm] is not one fifth of a circle, the motion of the balance will be more than one whole turn, as it receives the impulse entirely from the action or elasticity of the balance spring, in which there is no friction.

He goes on to say that therefore the only friction acting on the balance will be at the pivots, so if the pivot holes are jewelled (as they are on this watch) then a small movement with a light mainspring will still result in a healthy amplitude.

Leslie summarises the three main benefits of his invention as follows:

1. The balance receives the impulse without any friction.
2. Since the escape wheel has no connection with the balance arbor, bankings are not necessary. If, by accidental excessive amplitude, the balance spring should 'set' in a tighter or looser spiral, this will not put the escapement out of beat even though the balance itself will be in a different position when at rest.
3. Positional error is done away with since any slight change in the position of the balance arbor does not change its relationship with the escapement, since motion is communicated through the spring only.

While these benefits are generally true, the third point fails to recognise the main issue of positional errors – that of the balance and spring and the effects of gravity on those parts alone. Nevertheless, the concept of delivering the impulse through the balance spring was feasible; it does indeed reduce escapement friction on the balance and Leslie's is the first example of several later designs, some more practical than others. In his great work *The Marine Chronometer,* R. T. Gould was unfairly critical, writing that 'if it were mechanically feasible it would constitute the best of all escapements. But in practice this is not so.' [21] He goes on to say that the escapement '… presents no advantage over the ordinary cylinder escapement', which is certainly incorrect: the escape wheel running on the edge of the cylinder in an ordinary cylinder escapement greatly increases the friction that the balance experiences. Gould also claims: 'Its chief defect is that […] the impulse is given more or less at the extremity of the arc of vibration, instead of at its centre', and incorporated into his drawing of the escapement is his remark that 'This arrangement is impracticable…', implying that it would not work. In this Gould was not correct as, with the balance at rest, the cylinder escapement is unlocked and in the position of delivering impulse to the balance. Indeed, following careful conservation and technical analysis by the second author, the Russell-Cotes movement was found to work quite well, ticking away merrily even with the movement in the vertical position.[22]

Other features of note

On the upper plate of the Russell-Cotes watch, close to where the balance spring is fixed, is a brass screw with a protruding pin. In Fig. 17 the pin is shown pointing in the opposite direction, but with the screw turned through 180 degrees (the top of a pillar has been cut off to allow this), the pin falls alongside the balance spring and fits Leslie's description that 'the watch may be regulated by applying a curb to the outward turn of the spring in the usual way.' [23] Swivelling the screw will alter the degree of its contact with the spring during operation. Two empty holes in the edge of the plate could have been where a scale was affixed, with an extension of the pin protruding from the other side of the screwhead used as indicator.

Leslie's overall concept of impulsing through the balance spring certainly had highly important successors, including Riefler's escapements for both watches and precision pendulum clocks, so it was the start of important innovation. Having said this, Leslie's own escapement may well have been temperamental in use, and at the time of writing no other physical examples of this patent have been found. One wonders if more were made than those for 'the first four sea captains that saw them'. The extract in *Repertory of Arts…* clearly indicates that the train count/dial layout and 'free-balance arm' were intended to *both* form part of a Leslie 'nautical watch', and yet the only other known double-dial Leslie watch (illustrated by Newman) has a duplex escapement which acts on the balance in the usual way.[24] Perhaps this is more evidence that Leslie fairly swiftly abandoned the escapement patent.

21. Rupert T. Gould, *The Marine Chronometer: Its History and Development. 2nd Edition* (Woodbridge: Antique Collectors Club, 2013), pp. 144–146.

22. Dale Sardeson *Instagram post on account @dalesardeson shows the watch working well*. 5 June 2019.

23. 'Description of a Nautical Watch.' *The repertory of arts and manufactures*, Vol. II. (December 1795), p. 96.

24. Newman 'Robert Leslie, Part 2', p. 157.

Train of the Russell-Cotes movement

Great	80t				
Centre	10l	60t			
3rd		8l	51t		
4th			7l	56t	
Escape				7l	15t

Motionwork of the Russell-Cotes movement

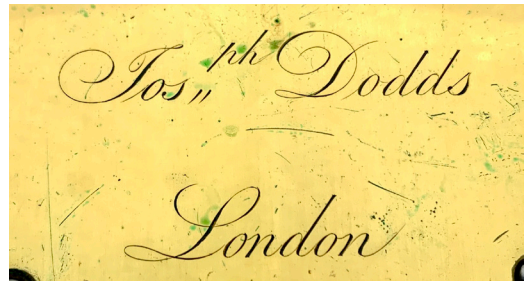
				(2nd Centre)	10l	
Cannon	10l			Cannon	10l	
Minute	40t	12l		Minute	40t	12l
Hour		36t		Hour		36t

In the Russell-Cotes movement there is another oddity in its construction. The train count differs slightly from that given in the patent, the third wheel having only 51 teeth instead of the 56 on the patent diagram (Fig. 5). This very odd number means that not only does the balance beat at the unusual frequency of 13,114/hour, but the seconds hand cannot register correctly on its dial, taking just under 66 seconds to complete a full rotation. The wheel appears to be correct and unaltered and one can only assume it was an error which was never put right owing to the unreliability of the movement as a whole.

Clocks in stock

Meanwhile, how was the rest of the business faring? Getting more involved in the horological side of the trade, Joseph Dodds had joined the Clockmakers' Company as a Freeman at the end of 1794 and in March the following year joined the Livery. Echoing the high style of his stock of watches exampled earlier, in the 1790s Dodds was also retailing domestic clocks in the latest fashions, balloon clocks being notable among his offerings.

This is where we meet the balloon clock at Belmont again (Figs.1, 18 and 19), a type very much in vogue during the 1790s. In an ebonised fruitwood and oak case, the clock has a two-train fusee movement with rack hour striking with trip hour repeating. Designed to employ a half-seconds pendulum, the clock has a seconds dial and now has a mid-nineteenth century anchor escapement and pendulum. The half-white, half-black globe Moon situated in a hemi-spherical brass shroud on top of the case (showing the phases



Figs 18 and 19. The movement of Belmont's balloon clock by Joseph Dodds with detail of the movement signature (Harris (Belmont) Charity).

in the manner of a 'Halifax moon'), is driven from the hour wheel of the motion work. A single pin on the hour wheel (one turn in 12 hours) advances a wheel of 12 teeth at the lower end of a vertical arbor (thus rotating once in six days) with a pinion of six at the top. The pinion meshes with a wheel of 29 teeth at the base of the arbor on which the moon globe is mounted, and the moon thus rotates once every 29 days – not a very accurate lunar representation. The moon globe can be lifted out of engagement with the pinion, and setting it back by one tooth every two lunations (59 days) would provide reasonably long-term accuracy.

In December 1793, 'Mr Dodd' is recorded in the daybooks of Aynsworth Thwaites as ordering 'A New Spring Clock with 7" round

Fig. 20. The Thwaites day book entry for January 1794, showing a spring clock with ball moon indication, supplied to Dodds (Clockmakers' Company).

Fig. 21. A trade card of Leslie's dated to c.1799, showing him in business in Oxford Street, presumably having given up his arrangement with Dodds. (British Museum).

Diall Plate with a Ball Moon at the Top of the Case with Chains to the Fuzeys with Dead Scapement & Patent Pendulum' priced at 'T/T/-' (£8/8/0 – Eight Guineas). In January 1794 another exactly the same was supplied to Dodds (Fig. 20), and another, including 'Patent Scapement' in February, this time charged to Messrs Dodd & Leslie., all charged at the same price. It is very tempting to suppose that one of these might be a reference to Belmont's balloon clock, but sadly Belmont's example has (and always has had) gut lines to the fusees. There are also no signs of punched or cast letters or a serial number that one often sees on Thwaites movements and it is just as likely this clock was sourced by Dodds from another trade clockmaker working in the same manner as Thwaites. So, it appears that there were at least four balloon clocks retailed by Dodds and Leslie.[25]

Why the dial of the Belmont clock should be signed *L* Dodds remains a mystery (the dial painting appears to be the original), though one possible explanation is that, because the 'King's Patent' was actually in Leslie's name, the 'L' might be a way of hinting at the Leslie/Dodds co-operative. But then Dodds didn't feel the necessity with the nautical watches, so it may just have been a mistake by the dial painter. The 'King's Patent' also suggests something patented in the object itself, and as the escapement has been replaced, it is possible that the earlier one had been one of Leslie's constant-force escapements. The design would certainly have been tricky to set up and is likely to have been troublesome for ordinary clock repairers.

In September 1794, under the bill for: 'Messrs Dodd & Leslie' in Thwaites day-book, was a sub entry: 'Messrs Leslie & Price - To 2 new Plain Spring Clocks with 7in Plates Silvered & 1 Jappannd, in Plain Mahogany Cases' (£7/12/- each) and 'To a (ditto) better finished with flat pendulum & in a neat black Case (£8/12/-) with Package to the above 7/-' (seven shillings). This order for three clocks, probably bank-rolled by Dodds for the time being, was evidently for export to Philadelphia.

25. Another, even more elegant, balloon clock signed by Dodds is seen in: Andrew Nicholls, *English Bracket and Mantel Clocks* (Poole: Blandford Press, 1981), p. 109, and a small number of other clocks signed by Dodds are known.

Dodds & Leslie

Nothing is currently known of the activities at 12 Aldersgate Street between 1796 and 1798, though Newman shows London-made watches being produced signed Leslie and Price up to 1797/8, so Leslie was still in business up to that time. However in September 1798, disaster struck. Isaac Price, Leslie's partner in Philadelphia, died of fever at just 30 years old, and Leslie's businesses in the US were quickly closed. It seems Leslie did not return home immediately and in June 1799 he was advertising from a new address at 230 Oxford Street (Fig. 21), surely representing an end to the relationship with Joseph Dodds, which does not appear to have been very profitable for Dodds. In 1800 Leslie returned to the US, and with his businesses closed (though still busy trying to sort out the US business affairs which had been badly mismanaged), he turned his attentions to improving machinery for stamping and minting coinage. However, he was now suffering from poor health, and in 1803 Leslie contracted a fever and died at the end of that year.

Meanwhile, Joseph Dodds was continuing in business at 12 Aldersgate Street. The Old Bailey records reveal that in 1802 he was witness to a robbery near to his shop. Following the robber for some time through the London streets, Dodds was able to get him accosted and gave evidence which saw him found guilty and transported. In April 1803 Dodds took on an apprentice, one William Stephens from Scarborough, but nothing more can be found about him and it seems he did not complete his apprenticeship. In 1807, Dodds had another go, taking on a young namesake Joseph Dodds, 'son of William Dodds, Gent.,' for the cost of 'one penny' and who was very likely a relative, perhaps Joseph's nephew.

Bankruptcy

Unfortunately, Dodds's business did not prosper, and on 12 July 1809 he was declared bankrupt, the *Morning Chronicle* on 5 August that year sadly recording the sale of:

> The genteel HOUSEHOLD FURNITURE, plate, linen, china, books, table clocks, capital mahogany glass cases, valuable stock, beneficial lease, and effects of Mr Joseph Dodds, Jeweller and Silversmith; the stock consisting of a fashionable assortment of jewellery, a variety of modern plate, plated goods, cutlery, &c, will be sold the second day.

It is impossible to say what led to his tragic circumstances, but one wonders if Joseph's unlimited support for Robert Leslie in the preceding decade might have contributed. It would appear that the apprenticeship of the younger Joseph Dodds continued, either with Joseph senior, or perhaps turned over to another master after the bankruptcy, as Joseph junior was made a Freeman of the Clockmakers' Company on 7 November 1814. In January 1816, the *Courier* records the death of Mrs Mary Bearda Dodds, wife of Joseph Dodds, late of Aldersgate Street and, according to the Clockmakers' Company archives, on 7 July the following year Dodds died too. A Joseph Dodds, living in Chiswell Street a couple of streets away from the old Aldersgate Street shop, is recorded as marrying Ann Catton of York on 23 April 1824 and is likely to have been the younger Dodds continuing in business.

On reflection one might conclude that Dodds's support of Leslie had been naïve and ill-advised. Nevertheless, while some of the patent designs were evidently not technically important, the evidence in this one surviving watch movement represents a sound idea and one which a century later was developed with great success in precision clockwork. In the 1790s though it seems it was just too far ahead of its time to be beneficial for Joseph Dodds and Robert Leslie.

Acknowledgements

Thanks to Rich Newman for providing the link between Leslie and Dodds and encouraging the writing of this article. Thanks also to Duncan Walker and staff of the Russell-Cotes Art Gallery & Museum, for allowing the study of the watch, and use of its image, and to West Dean College, where much of this research was carried out when Dale was a student there under the generously helpful, and always expert, tutelage of Malcolm Archer. For other help thanks also to Robert Wren, James Nye, Stefan Muser and David Penney, and to Jeremy Evans for generously searching the newspaper archives for references.