

**A.D. 1769 . . . . . N° 913.**

**STEAM ENGINES.**

**WATT'S SPECIFICATION.**

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**TO ALL TO WHOM THESE PRESENTS SHALL COME**, I, **JAMES WATT**, of Glasgow, in Scotland, Merchant, send greeting.

**WHEREAS** His most Excellent Majesty King George the Third, by His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Fifth day of January, in the ninth year of His reign, did give and grant unto me, the said James Watt, His special licence, full power, sole privilege and authority, that I, the said James Watt, my executors, administrators, and assigns, should and lawfully might, during the term of years therein expressed, make, use, exercise, and vend, throughout that part of His Majesty's Kingdom of Great Britain called England, the Dominion of Wales, and Town of Berwick-upon-Tweed, and also in His Majesty's Colonies and Plantations abroad, my "**NEW INVENTED METHOD OF LESSENING THE CONSUMPTION OF STEAM AND FUEL IN FIRE ENGINES;**" in which said Letters Patent there is contained a proviso obliging me, the said James Watt, by an instrument in writing under my hand and seal, to cause a particular description of the nature of the said Invention to be inrolled in His Majesty's High Court of Chancery within four calendar months after the date of the said Letters Patent, as in and by the same, relation being thereunto had, may more fully and at large appear.

**NOW KNOW YE**, that in compliance with the said proviso, I, the said James Watt, do hereby declare that the following is a particular description of the nature of my said Invention, and the manner in which the same is to be performed (that is to say):—

My method of lessening the consumption of steam, and consequently fuel, in fire engines, consists of the following principles:—

**First**, That vessel in which the powers of steam are to be employed to work the engine, which is called the cylinder in common fire engines, and which I call the steam vessel, must, during the whole time the engine is at work, be kept as hot as the steam that enters it; *first*, by inclosing it in a case of wood, or any other materials that transmit heat slowly; *secondly*, by surrounding it with steam or other heated bodies; and, *thirdly*, by suffering neither water nor any other substance colder than the steam to enter or touch it during that time.

**Secondly**, In engines that are to be worked wholly or partially by condensation of steam, the steam is to be condensed in vessels distinct from the steam vessels or cylinders, although occasionally communicating with them; these vessels I call condensers; and, whilst the engines are working, these condensers ought at least to be kept as cold as the air in the neighbourhood of the engines, by application of water or other cold bodies.

**Thirdly**, Whatever air or other elastic vapour is not condensed by the cold of the condenser, and may impede the working of the engine, is to be drawn out of the steam vessels or condensers by means of pumps, wrought by the engines themselves, or otherwise.

**Fourthly**, I intend in many cases to employ the expansive force of steam to press on the pistons, or whatever may be used instead of them, in the same manner as the pressure of the atmosphere is

now employed in common fire engines: In cases where cold water cannot be had in plenty, the engines may be wrought by this force of steam only, by discharging the steam into the open air after it has done its office.

**Fifthly**, Where motions round an axis are required, I make the steam vessels in form of hollow rings, or circular channels, with pistons fitted to them, or with valves that open one way, so that the steam shall circulate and drive the fluids contained in the channels, or pistons directly, round an axis, or by other mechanical contrivances to convert the reciprocal motion of the pistons into a rotative motion.

**Sixthly**, I intend in some cases to apply a degree of cold not capable of reducing the steam to water, but of contracting it considerably, so that the engines shall be worked by the alternate expansion and contraction of the steam.

**Lastly**, Instead of using water to render the piston or other parts of the engines air and steam-tight, I employ oils, wax, resinous bodies, fat of animals, quicksilver, and other metals in their fluid state.

**IN WITNESS** whereof, I have hereunto set my hand and seal, this Twenty-fifth day of April, in the year of our Lord One thousand seven hundred and sixty-nine.

**JAMES WATT. (L.S.)**

**AND BE IT REMEMBERED**, that on the said Twenty-fifth day of April, in the ninth year of the reign of King George the Third, the aforesaid James Watt came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written.

*Inrolled the Twenty-ninth day of April, in the year of our Lord One thousand seven hundred and sixty-nine.*