



A.D. 1769 N^o 913.

Steam Engines, &c.

WATT'S SPECIFICATION.

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 the Fifth
5 day of January, in the ninth year of His said Majesty's 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 exors, admors, and assigns, should and lawfully might, during the term of years therein expressed, use, exercise, and vend, throughout that part of His Majesty's
10 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 recited Letters Patent is contained a proviso obliging me, the said James Watt, by writing under my hand and seal, to
15 cause a particular description of the nature of the said Invention to be inrolled in His Majesties High Court of Chancery within four calendar months after the date of the said recited Letters Patent, as in and by the said Letters Patent, and the Statute in that behalf made, relation being thereunto respectively had, may more at large appear.

20 NOW KNOW YE, that in compliance with the said provisoe, and in pursuance of the said Statute, I, the said James Watt, do hereby declare that the

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following is a particular description of the nature of my said Invention, and of 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 vessell in which the powers of steam are to be employed to work 5 the engine, which is called the cylinder in common fire engines, and which I call the steam vessell, must during the whole time the engine is at work be kept as hot as the steam that enters it, first, by enclosing 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 10 or 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 vessells distinct from the steam 15 vessells or cylinders, although occasionally communicating with them. These 15 vessells 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 20 out of the steam vessells 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 25 manner as the pressure of the atmosphere is now employed in common fire 25 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 vessells in form of hollow rings or circular channels, with proper inlets and outlets for 30 the steam, mounted on horizontal axles like the wheels of a water mill; within them are placed a number of valves that suffer any body to go round the channell in one direction only. In these steam vessells are placed weights, so fitted to them as intirely to fill up a part or portion of their channels, yet rendered capable of moving freely in them by the means herein-after mentioned 35 or specified. When the steam is admitted in these engines between these weights and the valves, it acts equally on both, so as to raise the weight to one side of the wheel, and by the reaction on the valves successively to give a circular motion to the wheel, the valves opening in the direction in which the

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weights are pressed, but not in the contrary. As the steam vessel moves round it is supplied with steam from the boiler, and that which has performed its office may either be discharged by means of condensers, or into the open air.

Sixthly, I intend in some cases to apply a degree of cold not capable of
5 reducing the steam to water, but of contracting it considerably, so that the engines shall be worked by the alternate expansion and constraction 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, rosinous bodies, fat of animals,
10 quicksilver and other metalls, 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.)

15 Sealed and delivered in the presence of

COLL. WILKIE.

GEO. JARDINE.

JOHN ROEBUCK.

Be it remembered, that the said James Watt doth not intend that any
20 thing in the fourth article shall be understood to extend to any engine where the water to be raised enters the steam vessell itself, or any vessell having an open communication with it.

JAMES WATT.

Witnesses,

25 COLL. WILKIE.

GEO. JARDINE.

AND BE IT REMEMBERED, that on the Twenty-fifth day of April, in the year of our Lord 1769, the aforesaid James Watt came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid,
30 and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stampd according to the tenor of the Statute made in the sixth year of the reign of the late King and Queen William and Mary of England, and so forth.

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

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EXTENSION OF PATENT

OF

JAMES WATT.

STEAM ENGINES, &c.

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A.D. 1769 N^o 913*.

Steam Engines, &c.

WATT'S EXTENSION.

AN ACT for vesting in **JAMES WATT**, Engineer, his executors, administrators, and assigns, the sole use and property of certain Steam Engines, commonly called Fire Engines, of his Invention, described in the said Act, throughout His Majesty's Dominions, for a limited time. [22nd May 1775.]

5 **WHEREAS** His most Excellent Majesty King George the Third, by His Letters Patent under the Great Seal of Great Britain, bearing date the Fifth day of January, in the ninth year of His reign, did give and grant unto James Watt, of the City of Glasgow, Merchant, his executors, administrators, and assigns, the sole benefit and advantage of making and vending certain
10 engines by him invented for lessening the consumption of steam and fuel in fire engines, within that part of His Majesty's Kingdom of Great Britain called England, the Dominion of Wales, and the Town of Berwick-upon-Tweed, and also in His Majesty's Colonies and Plantations abroad, for the term of fourteen years, with a proviso, obliging the said James Watt, by
15 writing under his 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 months after the date of the said recited Letters Patent: And whereas the said James Watt did, in pursuance of the said proviso, cause a particular description of the said engine to be inrolled in the said High
20 Court of Chancery upon the Twenty-ninth day of April, in the year of our Lord One thousand seven hundred and sixty-nine, which description is in the words and form or to the effect following; 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

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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 enclosing 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 or 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 elastick 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 [which fourth article the said James Watt declares in a note affixed to the Specification of the said engine should not be understood to extend to any engine where the water to be raised enters the steam vessel itself, or any vessel having an open communication with it]. Fifthly, where motions round an axis are required, I make the steam vessels in form of hollow rings or circular channels, with proper inlets and outlets for the steam, mounted on horizontal axles, like the wheels of a water mill; within them are placed a number of valves that suffer any body to go round the channel in one direction only; in these steam vessels are placed weights, so fitted to them as entirely to fill up a part or portion of their channels, yet rendered capable of moving freely in them by the means hereinafter mentioned or specified. When the steam is admitted in these engines between these weights and the valves, it acts equally on both, so as to raise the weight to one side of the wheel, and by the reaction on the valves successively to give a circular motion to the wheel, the valves opening in the direction in which the weights are pressed, but not in the contrary; as the steam vessel moves round, it is supplied with steam from the boiler, and that which has performed its office may either be discharged by means of condensers or into the open air. Sixthly, I intend in some cases to apply a degree of cold not

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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, rosinous bodies, fat of
5 animals, quicksilver, and other metals in their fluid state: And whereas the said James Watt hath employed many years and a considerable part of his fortune in making experiments upon steam and steam engines, commonly called
10 fire engines, with a view to improve those very useful machines, by which several very considerable advantages over the common steam engines are acquired; but upon account of the many difficulties which always arise in the execution of such large and complex machines, and of the long time requisite to make the necessary trials, he could not complete his Intention before the end of the year One thousand seven hundred and seventy-four, when he finished some large engines as specimens of his construction, which have succeeded so
15 as to demonstrate the utility of the said Invention: And whereas in order to manufacture these engines with the necessary accuracy, and so that they may be sold at moderate prices, a considerable sum of money must be previously expended in erecting mills and other apparatus, and as several years and repeated proofs will be required before any considerable part of the publick can
20 be fully convinced of the utility of the Invention and of their interest to adopt the same, the whole term granted by the said Letters Patent may probably elapse before the said James Watt can receive an advantage adequate to his labour and Invention: And whereas by furnishing mechanical powers at much less expence and in more convenient forms than has hitherto been done, his
25 engines may be of great utility in facilitating the operations in many great works and manufactures of this kingdom, yet it will not be in the power of the said James Watt to carry his Invention into that complete execution which he wishes, and so as to render the same of the highest utility to the publick of which it is capable, unless the term granted by the said Letters Patent be
30 prolonged and his property in the said Invention secured not only within that part of Great Britain called England, the Dominion of Wales, the Town of Berwick-upon-Tweed, and His Majesty's Colonies and Plantations abroad, but also within that part of Great Britain called Scotland, for such time as may enable him to obtain an adequate recompence for his labour, time, and
35 expence. To the end, therefore, that the said James Watt may be enabled and encouraged to prosecute and compleat his said Invention, so that the publick may reap all the advantages to be derived therefrom in their fullest extent, may it please your most Excellent Majesty (at the humble petition and request of the said James Watt), that it may be enacted; and be it enacted by the

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King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, that from and after the passing of this Act the sole privilege and advantage of making, constructing, and selling the said engines herein-before particularly described within the Kingdom of Great Britain and 5 His Majesty's Colonies and Plantations abroad, shall be and are hereby declared to be vested in the said James Watt, his executors, administrators, and assigns, for and during the term of twenty-five years, and that he, the said James Watt, his executors, administrators, and assigns, and every of them, by himself and themselves, or by his and their deputy or deputies, servants or 10 agents, or such others as he, the said James Watt, his executors, administrators, and assigns, shall at any time agree with, and for no others, from time to time and at all times during the term of years herein-before mentioned, shall and lawfully may make, use, exercise, and vend the said engines within the Kingdom of Great Britain and in His Majesty's Colonies and Plantations 15 abroad, in such manner as to him, the said James Watt, his executors, administrators, and assigns, shall in their discretions seem meet, and that the said James Watt, his executors, administrators, and assigns, shall and lawfully may have and enjoy the whole profit, benefit, commodity, and advantage from time to time coming, growing, accruing, and arising by reason of these his said 20 Inventions for the said term of twenty-five years, to have, hold, receive, and enjoy the same for and during and to the full end and term of twenty-five years as aforesaid; and that no other person or persons within the Kingdom of Great Britain, or any of His Majesty's Colonies or Plantations abroad, shall at any time during the said term of twenty-five years, either directly or indirectly, do 25 make, use, or put in practice the said Inventions, or any part of the same so attained unto by the said James Watt as aforesaid, nor in anywise counterfeit, imitate, or resemble the same, nor shall make or cause to be made any addition thereunto or subtraction from the same, whereby to pretend himself or themselves the inventor or inventors, deviser or devisors thereof, without the licence, 30 consent, or agreement of the said James Watt, his executors, administrators, or assigns, in writing under his or their hand and seal, or hands and seals, first had and obtained in that behalf, upon such pains and penalties as can or may be justly inflicted on such offenders for their contempt of this Act, and further, to be answerable to the said James Watt, his executors, administrators, and 35 assigns, according to law, for his and their damages thereby occasioned.

Provided always, and be it hereby declared, that nothing in this Act contained shall extend or be construed to extend to prejudice or hinder any person or persons from making or using any fire or steam engine, or any particular con-

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trivance relating to the same, which is not at present of the Invention of the said James Watt, or which has been publickly used or exercised by any other person or persons before the time of the date of the said Letters Patent herein recited, but that all such engines and contrivances which are not at
5 present of the said Invention of the said James Watt, or are not particularly specified in this Act, shall be and remain to the publick and to the respective Inventors thereof as if this Act had never been made, any thing herein contained to the contrary notwithstanding.

Provided also, that every objection in law competent against the said Patent
10 shall be competent against this Act to all intents and purposes, except so far as relates to the term hereby granted.

Provided always, that if the said James Watt, his executors, administrators, or assigns, or any person or persons who shall at any time during the said term of twenty-five years have or claim any right, title, or interest in law or
15 equity, of, in, or to the power, privilege, or authority of the sole use and benefit of the said Invention, shall make any transfer or assignment, or pretended transfer or assignment, of the said liberty or privilege hereby granted, or any share or shares of the benefit or profits thereof, or shall declare any trust thereof
20 cause to be opened any book or books for publick subscriptions to be made by any number of persons exceeding the number of five, in order to the raising any sum or sums of money under pretence of carrying on the said liberty or privilege hereby granted, or shall by him or themselves, or his or their agents or servants, receive any sum or sums of money whatsoever of any number of
25 persons exceeding in the whole the number of five, for such or the like intents or purposes, or shall presume to act as a corporate body, or shall divide the benefit of the liberty or privileges hereby granted into any number of shares exceeding the number of five, or shall commit or do, or procure to be committed or done, any act, matter, or thing whatsoever during such time as such
30 person or persons shall have any right or title, either in law or equity, which shall be contrary to the true intent and meaning of an Act of Parliament made in the sixth year of the reign of His late Majesty King George the First, intituled An Act for the better securing certain Powers and Privileges intended to be granted by His Majesty, by Two Charters for Assurance of
35 Ships and Merchandises at Sea, and for lending Money upon Bottomry, and for restraining several extravagant and unwarrantable Practices therein mentioned; or in case the said power, privilege, or authority shall at any time become vested in or in trust for more than the number of five persons or their representatives at any one time, otherwise than by devise or succession (reckon-

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ing executors and administrators as and for the single persons whom they represent as to such interest as they are or shall be intitled to in right of such their testator or intestate), that then and every of the said cases, all liberties and advantages whatsoever hereby granted shall utterly cease, determine, and become void, any thing herein-before contained to the contrary thereof in 5 anywise notwithstanding.

And be it further enacted by the authority aforesaid, that this Act shall be adjudged, deemed, and taken to be a publick Act, and shall be judicially taken notice of as such by all judges, justices, and other persons whomsoever without specially pleading the same.

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