July 24, 1923. 1,462,816

H. W. PARTLOW

GAS GOVERNOR FOR TYPESETTING MACHINES

Filed May 21, 1921 3 Sheets-Sheet 1

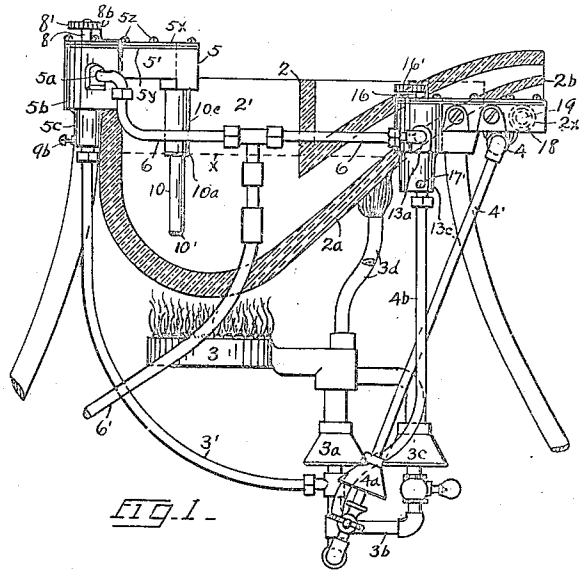

FIG. 1.

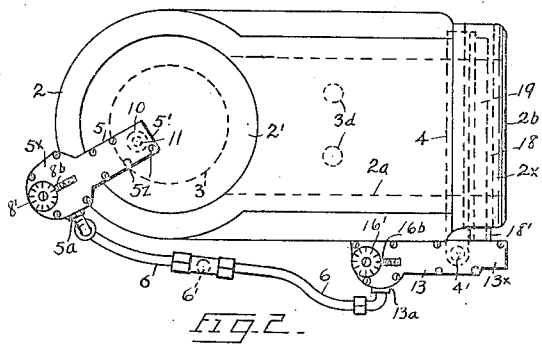

FIG. 2.

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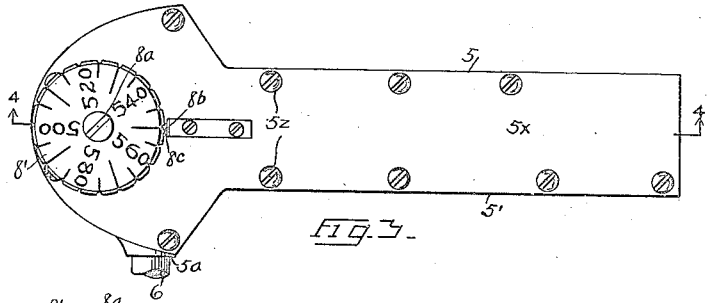

Fig. 3.

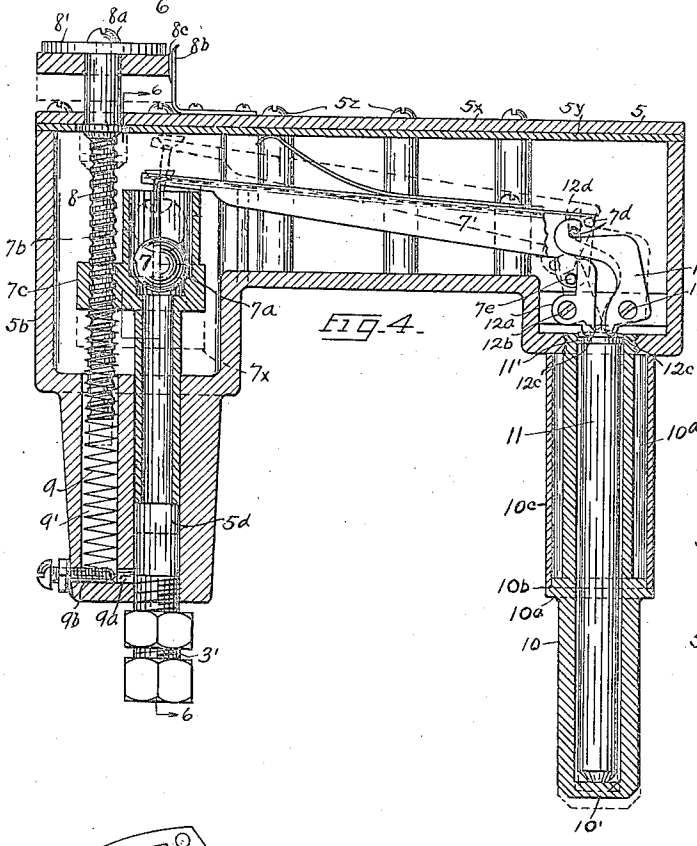

Fig. 4.

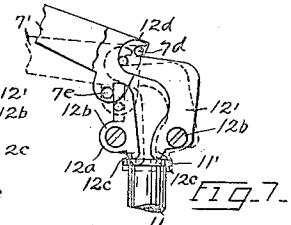

Fig. 7.

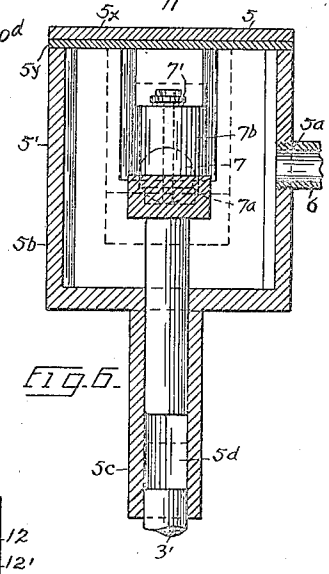

Fig. 6.

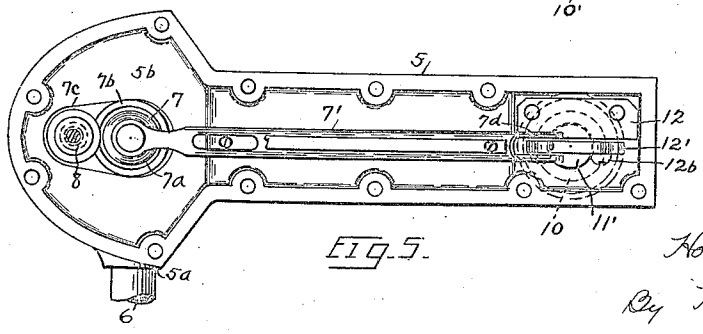

Fig. 5.

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GAS GOVERNOR FOR TYPESETTING MACHINES

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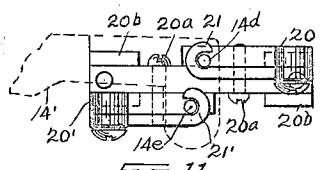

Fig. 11.

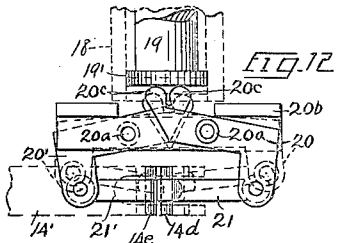

Fig. 12.

Fig. 8.

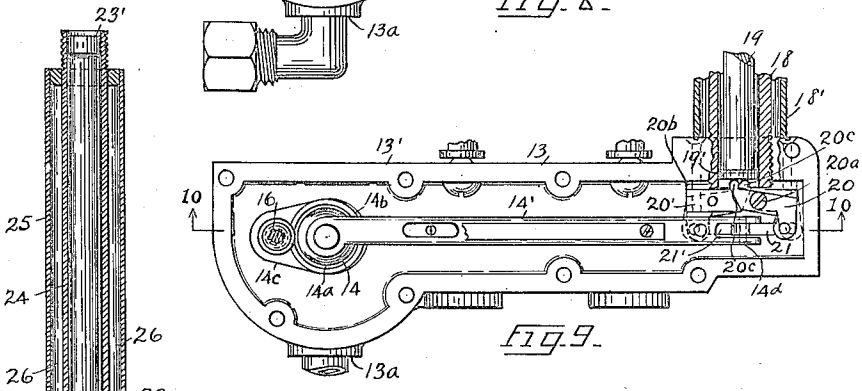

Fig. 9.

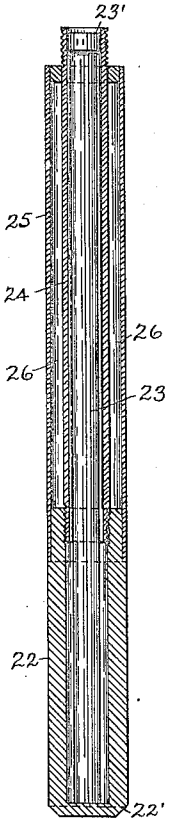

Fig. 13.

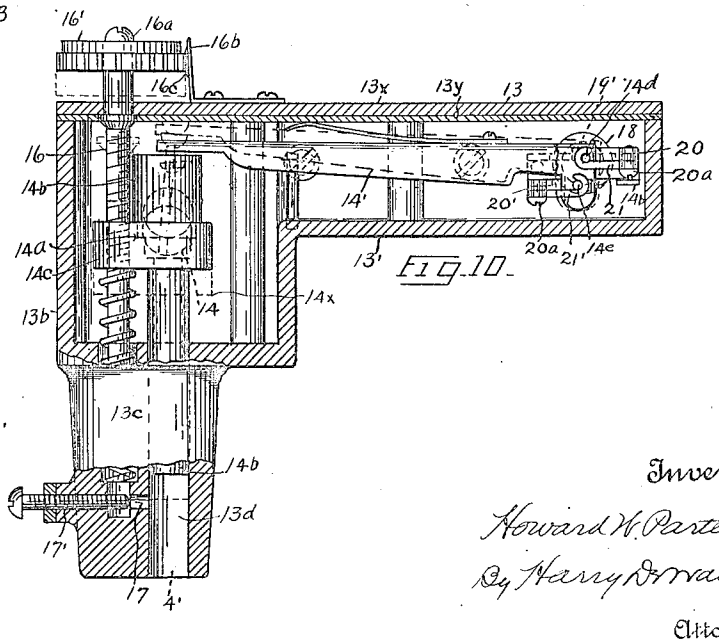

Fig. 10.

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Patented July 24, 1923. 1,462,816

UNITED STATES PATENT OFFICE.

HOWARD W. PARTLOW, OF UTICA, NEW YORK.

GAS GOVERNOR FOR TYPESETTING MACHINES.

Application filed May 21, 1921. Serial No. 471,516.

To all whom it may concern:

Be it known that I, HOWARD W. PARTLOW, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Gas Governors for Typesetting Machines, of which the following is a specification.

This invention relates to gas governors for melting-pots of linotype and other machines, wherein molten metal is employed, and has for its object to provide novel, simple, effective and automatic means for governing or regulating the gas-burners or other devices employed for melting the metal and for heating the pouring spouts of the pots, so as to maintain the metal at the proper and even temperature. A further object is to provide sensitive temperature governing mechanisms for melting-pots and the like, which are controlled mainly by the expansion and contraction of certain members of the governing apparatus, and which are so constructed and arranged as to readily and quickly effect the increasing or decreasing of the heat of the fusing and dispensing parts, whenever the temperature of the molten metal rises or falls a fraction of a degree. A further object is to provide a dial which is operatively connected with certain members of the fuel-controlling valve and by which any desired temperature, within a relatively broad range, may be predetermined and indicated. The said dial being manually operable and affording ready and convenient means for varying the temperature range independent of the automatic parts. A further object is to provide means by which the several burners are independently supplied with gas for preventing their accidental extinguishment, at times when the governing valves are entirely closed by the automatic controlling parts. A particular object is to provide a fuel valve actuating member having two pivot or fulcrum points, which are engaged by two oppositely movable and simultaneously operable devices which effect the opening and closing of the valve, the said devices being in constant operative engagement with the expansible and contractable members of the governor, and adapted to register positive movements at the slightest variations of the temperature.

I attain these objects by the means set forth in the detailed description which follows and as illustrated by the accompanying drawings in which—

Figure 1 is a sectional view of a melting-pot to which my improvement is applied. Fig. 2 is a top-plan view of the same. Fig. 3 is a top-plan view of one of the thermostatic governors. Fig. 4 is a vertical longitudinal section, taken on line 4—4 of Fig. 3; showing the construction and arrangement of the operating parts, the full and dotted lines showing the several positions of the valve and its actuating parts. Fig. 5 is a top-plan view of the body with the cover and dial removed. Fig. 6 is a vertical cross-section, taken on line 6—6 of Fig. 4. Fig. 7 is a detached partially broken view of the automatic valve-operating parts. Fig. 8 is a top-plan view of the auxiliary governor. Fig. 9 is a similar view of the same with the cover and dial removed. Fig. 10 is a vertical longitudinal section, taken on line 10—10 of Fig. 9; showing by full and dotted lines the various positions of the valve and related parts; also showing the manual controlling means for adjusting the valve casing relatively to the valve. Fig. 11 is an enlarged side elevation of the mechanism which tilts the valve lever. Fig. 12 is a top-plan view of the same parts, in which the full and dotted lines show the idle and the operated positions of the parts. And Fig. 13 is a sectional view showing a modification of the expansible parts.

In order to properly govern or regulate the temperature of melting-pots employed in connection with linotype and similar casting machines, it requires two or more thermostatic gas valves which must be located at different parts of the pot. Hence the present case is intended to embrace two governors, which perform identical work, both when operated manually and automatically, but wherein the automatic mechanisms necessarily differ somewhat in the details of construction and operation. The two governors while being supplied with fuel gas by a common medium, are practically independent in all their actions. This is due mainly to the fact that one governor has parts which are constantly in direct contact with the molten metal in the melting-pot, and its fuel valve is automatically operated by the changes in the temperature of the metal, while the other governor has

no direct contact with the molten metal, but is operated solely by the changes in the temperature of the metallic mouth portions of the spout through which the molten metal is poured during the casting operations. One of the governors however is materially influenced and its operations are partially controlled by the other governor, as will more clearly appear from the detailed description.

In the drawings, 2 represents conventionally a pot for melting type or other metals, which comprises the usual bowl 2′, a pouring spout 2^a, and a mouth 2^b. The heat for melting the metal in the bowl is produced by a burner 3, which receives the gas or other fuel through a pipe 3′, which discharges the gas into a mixer 3^a. Gas from the same source is carried by a pipe 3^b to a mixer 3^c and thence to a pair of similar burners 3^d, which serve to heat the intermediate portion of the spout 2^a (see full and dotted lines in Figs. 1 and 2). The mouth 2^b is heated by a horizontal burner 4, which receives the gas through a pipe 4′, a mixer 4^a, and a pipe 4^b. In Fig. 1 is shown all of the aforesaid burners in full flame for supplying the maximum heat to the several parts. The dotted line X in Fig. 1 shows approximately the normal level of the molten metal in the melting-pot 2.

The thermostatic governor of primary importance is designated by the numeral 5. This device is mounted upon the top edge of the bowl 2′, preferably as shown in Figs. 1 and 2. The body 5′ of the governor is elongated and hollow, as best seen in Figs. 3, 4 and 5, and is intended to be charged with the fuel gas which it receives through a port 5^a by means of a pipe 6, which also supplies the gas to the secondary governor, the supply of gas being delivered to the pipe 6 through a common pipe 6′. The open top of the body 5′ is closed by a cover 5^x, which rests upon a packing 5^y, and is held in place by a number of screws 5^z. The gas for the burners 3—3^d is drawn from the boxes 5′ of the governor 5. One end of the body 5′ has a depending hollow portion or depression 5^b, below which depends a reduced portion 5^c, which is bored out to provide an outlet passage 5^d, through which the gas flows into pipe 3′. The feeding of the gas from the body 5′ to the burners 3 and 3^d is controlled mainly by a valve 7, which in the present case is spherical. The said valve is loosely suspended from one end of a lever 7′, which is in operation a cantalever and permits the valve to gravitate to the seat without help from the rod 7′. The seat for the valve 7 is an annular ledge 7^a, which is disposed concentrically within a hollow cylindrical valve-case 7^b, the latter being slidably disposed in and is guided when moved vertically by the bore 5^d. By referring to Fig. 4 it will be seen that the valve casing 7^b may be reciprocated to a considerable extent, as shown by the full and dotted lines, for varying the position of the seat 7^a relatively to the valve 7. The vertical movements of the valve casing 7^b are effected by a screw 8, which passes through a threaded lug 7^c, the said screw preferably extending a considerable distance above and below said lug and its top end projecting above the cover 5^x, and being fitted with a dial 8′, which is held in place by a screw 8^a. The dial is graduated, and bears degree numbers, which in the present case cover the usual range of temperature (500°–600°) required for type and other similar metals. The dial is employed for manipulating the screw 8, for predetermining the proper position of the valve casing 7^b, for producing any desired temperature in the melting-pot within the range indicated by the markings on the dial. In order to hold the screw 8 and the valve casing 7^b from accidental shifting, I provide a spring 8^b which has a tooth 8^c that engages peripheral notches 8^d of the dial. In setting the dial the proper graduation is positioned opposite the tooth 8^c. The lower end of the screw 8 telescopes the top end of a compression spring 9, which exerts a constant upward pressure against the lateral ear or lug 7^c, and tends to normally hold the valve casing, as well as the screw 8, in the full line position shown in Fig. 4, which prevents the accidental gravitation of said parts. The lower end of the spring 9 projects into a well 9′, which communicates with the passage 5^d, by means of a relatively small hole or opening 9^a, the latter constituting a by-pass for supplying a small amount of gas to the burners 3—3^d, thereby preventing the accidental extinguishment of the flames. The by-pass is controlled by screw valve 9^b, as shown in Fig. 4.

The thermostatic elements and related parts which automatically control the gas supply for the burners 3—3^d will now be described: The opposite end of the body 2 is provided with a depression 2^c, whose bottom is perforated to receive the threaded top end of an expansion tube 10 (preferably brass), which projects downwardly into the molten metal in the bowl 2′. The free end 10′ of the said tube is preferably closed. Intermediate its ends, the tube 10 is provided with an annular flange 10^a and a corresponding shoulder 10^b, upon which rests a steel or other tubular jacket 10^c. The arrangement of the jacket is such that a clear annular air space 10^d is provided between it and the tube 10, which serves to insulate the top portion of the tube 10 from the heat of the molten metal, and likewise protects the said tube from radical temperature changes due to the action of the atmosphere. By this construction and arrangement the top of the

tube 10 is but slightly affected by either the atmosphere or the heat of the melting-pot, and therefore the expansibility of the said part is practically nil. The lower end portion of the tube 10 is normally submerged in the molten metal, and this portion alone of the tube 10 responds, by expansion and contraction, to the varying temperature of the melting-pot. This construction and arrangement furthermore renders the device more sensitive and constant in the performance of its work, than would be the case if the top portion of the tube 10 were bare and intermittently exposed to the atmosphere and the molten metal. Within the tube 10 is disposed a rod 11, preferably made of steel of a relatively high carbon content, which renders the said rod less liable to extreme ranges of expansion and contraction. It is preferred that the rod 11 have but a slight expansion and contraction, as will more clearly appear later on. The body of the rod 11 preferably loosely fits the bore of the tube 10 for facilitating its free expansion and contraction linearly, in case the said rod becomes warped or buckled when subjected for long periods to the extreme heat of the molten metal. The top end 11′ of the rod is preferably enlarged to approximately the same diameter as the bore of the tube 10, and the said head is preferably hardened for preventing wear. Above the rod 11 is rigidly mounted a block or base 12 and to one side of this base is pivoted two bell cranks or rockable members 12′ and 12^a, by pins or screws 12^b. These cranks are disposed and are operable in a common vertical plane and their lower ends are provided with ball portions 12^c, which are intended to be in constant frictional engagement with the top face of the head 11′. The ball-tips 12^c are both arranged eccentrically to the pivots 12^b, and therefore a slight lengthening or contraction of the rod 11 tends to tilt the upper or free ends of the cranks in opposite directions. The free end of the crank 12′ is formed into a hook 12^d which engages a fulcrum pin 7^d of the valve lever 7′. The free end portion of the crank 12^a is plain and is normally in frictional engagement with a similar fulcrum pin 7^e of the lever 7′, the latter pin being disposed in a lobe 7^f of said lever, and some distance below the pin 7^d. The full lines in Fig. 4 show the lever 7′, the cranks 12′ and 12^a and the expansion rod 11 in the idle position, which owing to the predetermined arrangement of the dial (the same being set for 550°, which is the normal temperature for type metal) effects a positive seating of the valve 7 in the casing 7^b. The dotted lines in Fig. 4 indicate that the rod 11 has expanded and has been moved upwardly, thereby tilting the cranks 12′ and 12^a in opposite directions and accordingly tilting the remote end of the valve lever 7′ upwardly, for opening the valve, and for allowing gas from the interior of the body 5′ to pass downwardly through the casing 7^b and the passage 5^d and on to the burners 3—3^d. At the first slight upward movement of the head 11′ the hook-end of the crank 12′ moves towards the right and exerts a pull on the pin 7^d. At the same time the crank 12^a is being rocked towards the left and pushes the pin 7^e in that direction. This simultaneous operation of the two cranks effects the upward tilting of the valve-end of the lever 7′, and during the said operation the lever 7′ fulcrums or pivots like a cantalever on both of the pins 7^d and 7^e. The spacing of the pins 7^d and 7^e and the eccentricity of the ball-tips 12^c, when taken with the length of the lever 7′, increases or multiplies the leverage many times. So that in practice, the lengthening of the rod 11 a few thousandths of an inch effects the lifting of the valve 7 sufficiently to allow the gas to the full capacity of the valve to be supplied to the burners 3—3^d. In Fig. 7 the full lines indicate the operated position of the parts, while the dotted lines correspond to the full line positions in Fig. 4, in which the parts are idle.

The temperature of the melting-pot may be greatly increased independently of the thermostatic parts, by turning the dial 8′ in the direction for lowering the valve casing 7^b, as to the position shown at 7^x in Fig. 4. This lowering of the casing 7^b disposes the seat 7^a out of reach of the valve 7, whose downward play is limited by the cranks 12′—12^a and allows the gas to flow freely from the box 5′ to the burners 3—3^d, until the temperature is run up to the desired height. The operator should then reset the dial for indicating the normal casting temperature. This latter change of the dial raises the seat 7^a back within the normal range of the valve 7, and therefore the thermostatic parts will control the temperature in the manner described. When the temperature of the molten metal has been raised to the normal, or above the normal, the tube expands and lengthens downwardly, as shown by the dotted lines in Fig. 4. If the valve 7 had been opened previous to the expansion of the tube 10 this lengthening of the said tube allows the rod 11 to drop correspondently and this effects the lowering of the valve 7 into its seat, due to the relaxing of the pressure of the rod 11 against the cranks 12′—12^a. The temperature of the molten metal rarely remains at any given point, whether the burners are operated at full blast or not, so that there are constant changes taking place in the tube 10 and the rod 11. That is to say, these parts are constantly expanding or contracting corresponding to the rising and falling of the

temperature of the melting-pot. Whenever the molten metal becomes chilled either because the burners have been shut off or because fresh cold type-metal has been inserted in the pot 2′, the tube 10 quickly contracts or shortens. This instantly effects the raising of the rod 11, which in turn tilts the lever 7′ and opens the valve 7. The gas then rushes out towards the burners, and the latter flame up and quickly restores the lost temperature, and so on, throughout the casting periods. When cold metal is placed in the melting-chamber the first effect is the chilling of the exposed end of the tube 10, which opens the valve 7, as described. In a few seconds' time this chill penetrates the tube 10 and reaches the rod 11 and said rod contracts sufficiently to slightly close the valve, and thus serves to prevent the burners from raising the temperature of the metal above the normal or what it has been before the insertion of the cold metal. In this way, extremes of temperatures which result in wasting the fuel, as well as the production of inferior castings are obviated. It furthermore shows the extreme sensitiveness of the automatic thermostatic control, which further enhances the value of my improvement. When the dial 8′ is set for any temperature within the range of the movements of the valve 7, any change in temperature as slight as one-half of a degree will set the automatic controlling part in operation, for correcting or restoring the temperature to the predetermined indication.

The auxiliary governor 13 which is employed for regulating the temperature of the mouth 2^b will now be described: 13′ represents a hollow body similar to the part 5′, which receives its supply of gas through a port 13^a and discharges the gas for heating purposes through a passage 13^d, which is formed in the depending portion 13^c, and from which the gas flows through the pipe 4′ to the burner 4, which is disposed beneath the mouth 2^b. The valve 14 (also spherical) is loosely swiveled to the forward end of a similar cantalever 14′, and is disposed in a hollow upright valve casing 14^b, in which is disposed an annular seat 14^a. The casing 14^b extends downwardly and is bored out its entire length and its lower reduced end loosely telescopes the gas passage 13^d. This casing has a threaded lug 14^c which receives a long screw 16, by which the casing may be raised and lowered, as shown by the full and dotted lines in Fig. 10. The top end of the screw 16 passes through the cover 13^x and the packing 13^y, and is surmounted by a dial 16′, which is similar in construction, markings and operation to the dial 8′, and is employed chiefly for predetermining the different temperatures at which the mouth 2^b may be maintained during the casting operations.

A similar by-pass 17, which is controlled by a screw valve 17′, supplies gas to prevent the extinguishment of the burners 4. The thermostatic elements consisting of an expansion tube 18, which is screwed into the rear side of the body 13′, projects horizontally beneath the mouth 2^b and is disposed parallel to the burner 4, as best shown by the dotted lines in Figs. 1 and 2. The pouring spouts of practically all melting-pots used in connection with linotype machines are provided with a transverse opening 2^x immediately beneath the mouth 2^b, and the expansion tube 18 is usually inserted in this opening, as shown.

A short jacket 18′ surrounds the tube 18 adjacent the body 13′, particularly for preventing circulation of the cooling atmosphere through the opening 2^x. The tube 18 is closed at its free end, and within said tube is loosely disposed a similar expansion rod 19 of harder metal, the said rod having a head 19′ which is disposed adjacent the inner wall of the body 13′, as best seen in Fig. 9. 20 and 20′ represent similar bell-cranks which are pivoted by screws 20^a to a block or support 20^b, the latter being rigidly fastened to the inner bottom portion of the box 13′. These cranks lie horizontally in parallel planes and the corresponding arms of the cranks are provided with ball-tips 20^c, which are in constant engagement with the head 19′ of the rod 19. The other arms of the bell-cranks are perforated, and to these are pivoted similar hooks 21—21′, which respectively engage fulcrum pins 14^d—14^e of the valve lever 14′, the said pins being arranged in substantially the same relation as shown in Figs. 4 and 7. By referring to Figs. 10 and 12, it will be seen that the weight of the lever 14′ and the valve 14 tend to hold the ball-tips 20^c in close frictional engagement with the head 19′, so that any slight lengthening or shortening of the rod 19 effects the raising or lowering of the valve 14 and its supporting lever. The functions and purposes of the parts 18, 19, 20 and 21 are identical to the similar parts employed in connection with the governor 5. So that further detailed description of the same seems unnecessary for the clear understanding of this secondary governor.

In practice whenever any slight change of temperature takes place at the mouth portion 2^b, the tube 18 and the rod 19 expand and contract as the case may be and effect the tilting of the lever 14′ and the opening or closing of the valve 14. These actions turn on and shut off the gas to the burner 4 and tend to hold the temperature of the mouth 2^b steadily at a predetermined degree. The thermostatic parts of the secondary governor are equally sensitive and act positively, quickly and independently whenever

the temperature varies as little as one half a degree. The said parts are so sensitive that a gust of wind striking the mouth portion 2^b, in the vicinity of the expansion parts 18 and 19, will instantly set the thermostatic elements to work and effect the turning on of the gas and the prompt restoring of the temperature of the parts. Whenever the burners 3—3^d are turned up for increasing the heat of the pot 2′, and the throat 2^a, more or less of the heat from the throat is conducted towards the mouth 2^b and therefore tends to maintain the proper temperature at the mouth. For this reason the governor 13 has less work to perform. This effects a considerable economy in the consumption of the fuel.

In Fig. 13 I have shown a slightly modified expansion tube which is composite and consists of the usual brass or similar metal portion 22, having a closed end 22′, which loosely receives the lower end of an expansion rod 23. The tube 22 is relatively short and represents the portion of the fitting which is normally and constantly submerged in the molten metal. The top end of the tube 22 is threaded internally to receive a longer and smaller tube 24 which receives and supports the upper end of the expansion rod 23, the said end preferably being provided with the usual enlarged head 23′ for the purposes heretofore explained. The top end of the tube 22 is also slightly reduced circumferentially to receive a shell 25, which with the tube 24 forms an annular air space 26 for insulating the parts 23—24 from the atmosphere as well as from the heat of the molten metal, as explained.

The entire absence of springs or other tension parts for either aiding or resisting the functions of the automatic control elements, enhances the sensitiveness and reliability of the present invention, and enables me to control temperatures within the broadest or narrowest ranges with greater accuracy and positiveness and at a greater saving of fuel than is possible by any other thermostatic governors known to me.

Having thus described my invention, what I claim, is—

1. A thermostatic governor including a hollow body adapted to be charged with fuel gas, an expansible tube projecting from the body, its free end adapted to be subjected directly to the heat of the element to be governed, a rod of lower expansibility loosely disposed in said tube, means for insulating the attached end portions of said tube and said rod, a loosely pendant valve for dispensing the gas from said body, a seat for said valve, a cantalever for supporting and operating said valve one end of said lever provided with spaced fulcrums by which said lever is pivotably supported, and a pair of oppositely movable cranks each frictionally engaging one of said fulcrums and each crank being in frictional engagement with said rod.

2. A thermostatic governor including a hollow body adapted to contain fuel gas, a valve for controlling the outflow of the gas from said body, a lever for supporting and operating said valve, the end of said lever remote from said valve having spaced fulcrum pins, a pair of rockable members engaging said fulcrum pins and supporting and operating said lever, an expansible rod having a head normally in constant engagement with the corresponding ends of said members and adapted when moved longitudinally to simultaneously rock said members in opposite directions for tilting the free end of said lever towards and from the valve seat, and an expansible tube in which said rod is loosely disposed, the free end of said tube adapted to be exposed to the direct heat of molten metal and the like, and having a greater expansibility than said rod for effecting the major movements of said valve.

3. The combination with a gas containing box and a valve for dispensing the gas, of a cantalever, one end of said lever loosely supporting said valve, the remote end of said lever provided with spaced fulcrum members, a pair of bell-cranks, one of said cranks having a hook engaging one of said fulcrum members, the other crank in frictional engagement with the other fulcrum member, said cranks adapted when rocked away from each other to effect the upward tilting of the valve-end of said lever, a rod of low expansibility in constant engagement with corresponding parts of said bell-cranks adapted to effect the minor movements of said cranks by its own expansion and contraction, a tube enclosing and supporting said rod, said tube having a greater expansibility than said rod adapted when expanding and contracting to move said rod longitudinally for effecting the major rocking movements of said bell-cranks.

4. A thermostatic governor including a hollow body adapted to contain fuel-gas, a valve for controlling the outflow of the gas from said body, a lever for supporting and operating said valve, the end of said lever remote from said valve having spaced fulcrum pins, a pair of rockable members engaging said fulcrum pins and supporting and operating said lever, an expansion tube adapted to be normally submerged in a body of molten-metal, a rod of lower expansibility than said tube loosely disposed in the tube, said rod being in constant and direct operative engagement with the corresponding parts of each of said members and adapted to rock said members for fully

opening the said valve by the contraction of said tube and to relax its pressure on said members for effecting the closing of the valve, by its gravitation, when said tube expands.

5. A thermostatic governor including a hollow body adapted to contain fuel gas, a valve for dispensing said gas disposed in said body, a valve seat movable in a vertical plane within said body, a lever supporting said valve, said lever movable in a vertical plane and having two transversely spaced fulcrum pins carried by its end remote from the valve, a pair of cranks normally engaging with and exerting pressure in opposite directions on the respective ones of said pins for pivotally supporting said lever adapted when rocked away from each other to lift the valve away from its seat, an expansible tube depending from the body and having its lower closed end normally submerged in a body of molten metal, said tube adapted to expand and contract linearly by the rise and fall of the temperature of said metal, a rod of lower expansibility loosely disposed in said tube adapted to raise and lower said lever for fully opening and closing said valve by the contraction and expansion of said tube, the top end of said rod being normally in engagement with each of said cranks and adapted to partially open and close said valve by its own expansion and contraction, and means for adjusting said valve seat for predetermining different degrees of temperature for the molten metal.

6. A thermostatic governor including a hollow body adapted to be charged with fuel gas, an expansible tube projecting from said body its free end adapted to be normally submerged in a body of molten metal. a rod of lower expansibility loosely disposed in said tube, means for insulating portions of said tube and said rod from the heat of the molten metal as well as from the cooling effect of the atmosphere, a valve for dispensing the gas from said body, a vertically movable seat for said valve, means for adjusting said seat for predetermining different degrees of temperature for said molten metal, a lever for supporting and operating said valve, said lever having spaced fulcrum pins, and a pair of bell-cranks engaging said pins and normally supporting said valve in suspended relation to its seat, the said bell-cranks being pivoted for movement in opposite directions and having ball-tips normally in engagement with one end of said expansion rod.

7. A thermostatic governor comprising a body having an outlet, a valve seat having an extension guided in the outlet, a thermostatically controlled valve coacting with the seat to govern the passage of fluid through the outlet, an adjusting screw journaled in the body and threaded through a portion of the valve seat to adjust the latter, and a spring engaged beneath said portion for urging the seat toward the valve.

8. A thermostatic governor comprising a body having an outlet and a well communicating at its lower end with the outlet, an adjustable valve for the communicating opening, a valve seat having an extension guided in the outlet, a thermostatically controlled valve coacting with the seat, a spring arranged in the well and urging the valve seat toward the valve, and an adjusting screw mounted in the body and engaging the valve seat member for adjusting the same.

9. A thermostatic governor comprising a body, heater-controlling means, and means for controlling the first means and including a lever pivotally mounted on the body, a thermostatic element extending from the body laterally of the plane of movement of the lever, and a movement-increasing leverage connecting the element to the lever.

10. A thermostatic governor comprising a body, heater-controlling means, and means for controlling the first means and including a lever pivotally mounted on the body, a thermostatic element extending from the body laterally of the plane of movement of the lever, a pair of opposed crank levers each engaged at one end by the element, a hook pivoted to the opposite end of each crank lever and engaged with the first lever to constitute the pivotal mounting therefor.

11. A thermostatic governor comprising a hollow body, a thermostatic element, a heater-controlling means, a lever connected to the last means, a pair of cooperating crank levers operable by the element and each interlocking with the lever to constitute the sole support therefor, and means for placing the lever under tension to hold the several parts operatively related.

12. A thermostatic governor comprising a hollow body, a thermostatic element, a heater-controlling means, a lever connected to the last means and carrying spaced bearing parts, a pair of cooperating crank levers operable by the element and each engaging a bearing part of the lever to constitute the sole support therefor, and a leaf spring secured to the lever and bearing outwardly against a wall of the hollow body to maintain the mounting for the lever.

In testimony whereof I affix my signature.

HOWARD W. PARTLOW.