

No. 637,669.

Patented Nov. 21, 1899.

W. P. ROBERTS.
LEATHER IRONING MACHINE.

(Application filed June 19, 1899.)

(No Model.)

4 Sheets—Sheet 1.

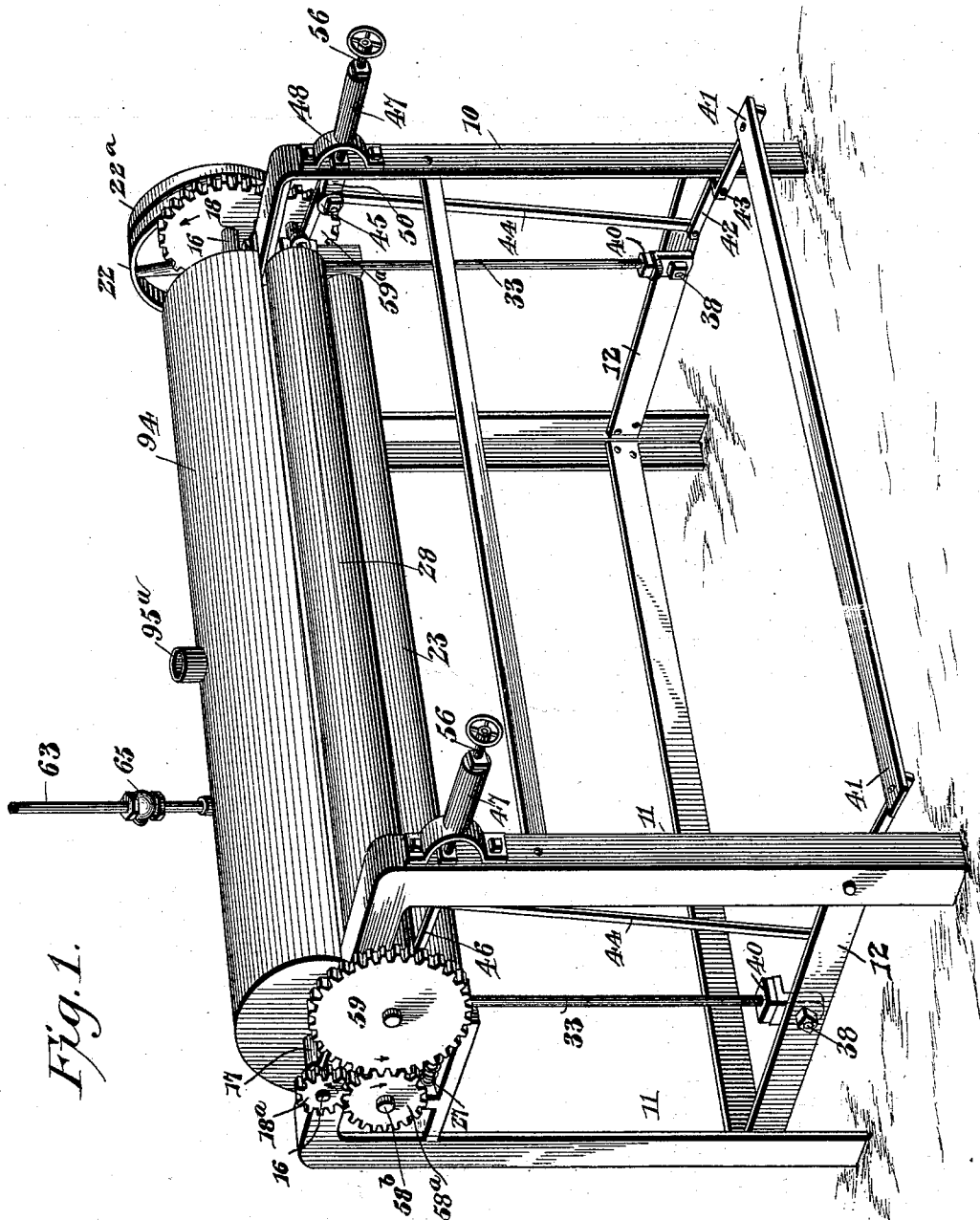


Fig. 1.

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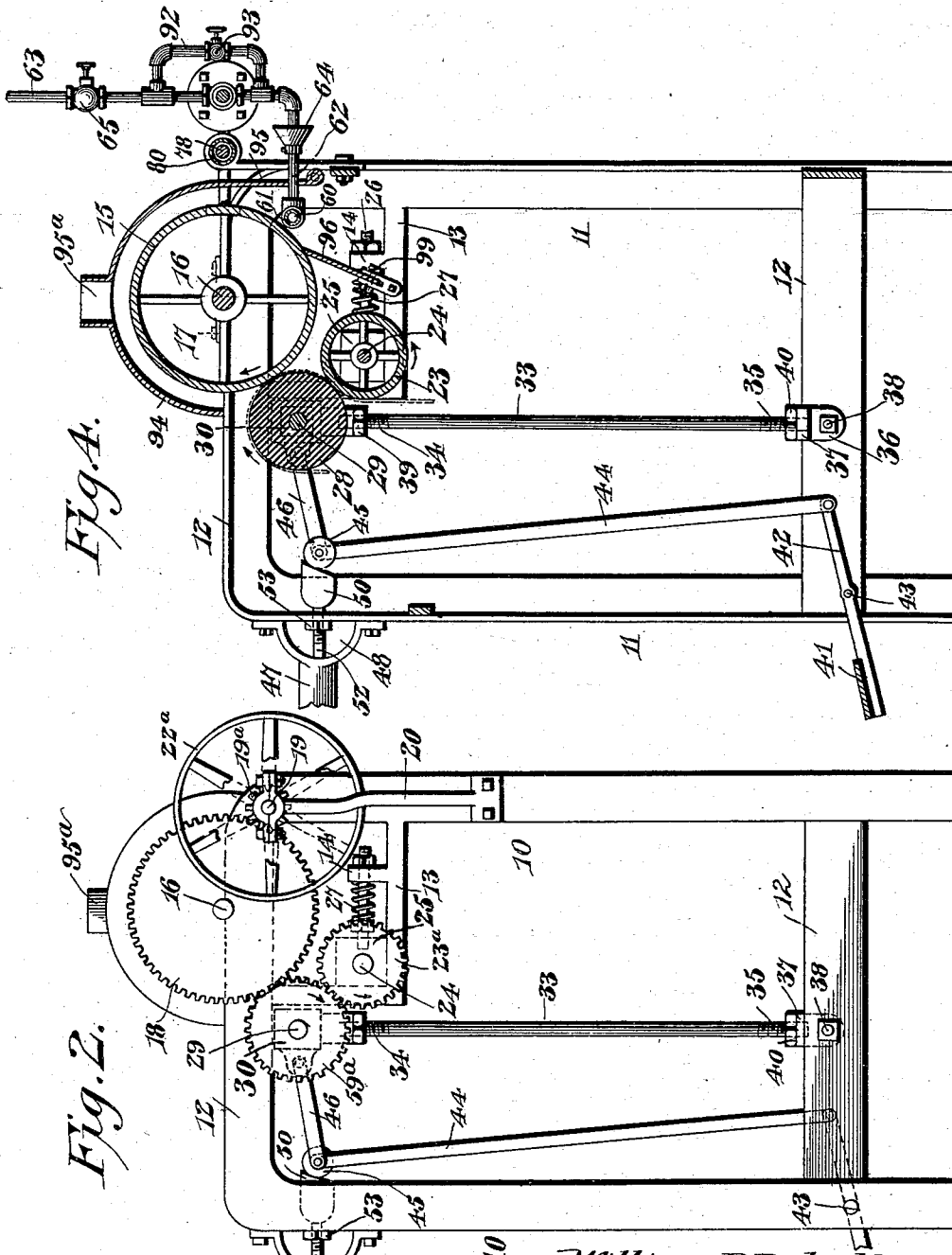
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4 Sheets—Sheet 2.



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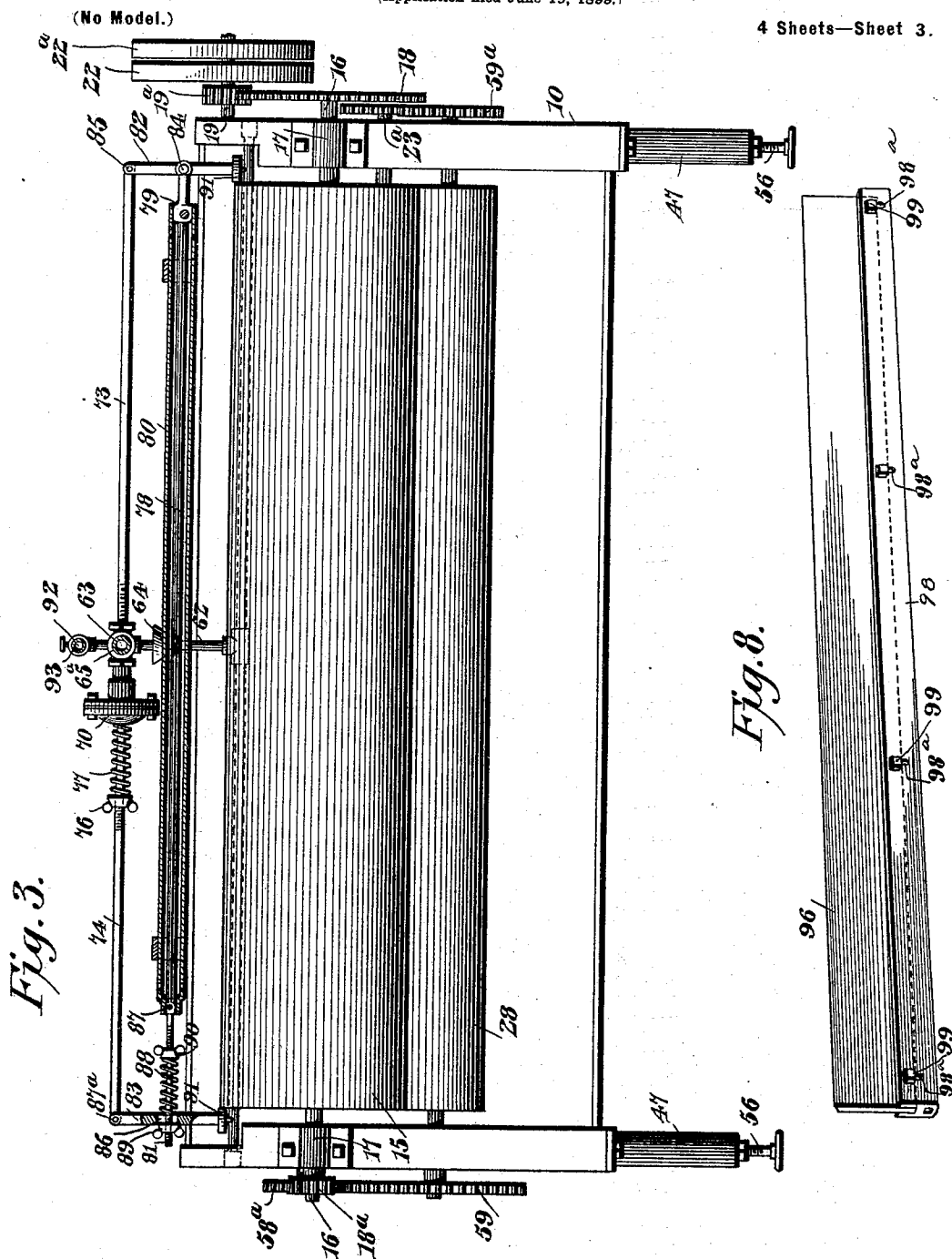


Fig. 3.

Fig. 8.

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4 Sheets—Sheet 4.

Fig. 7.

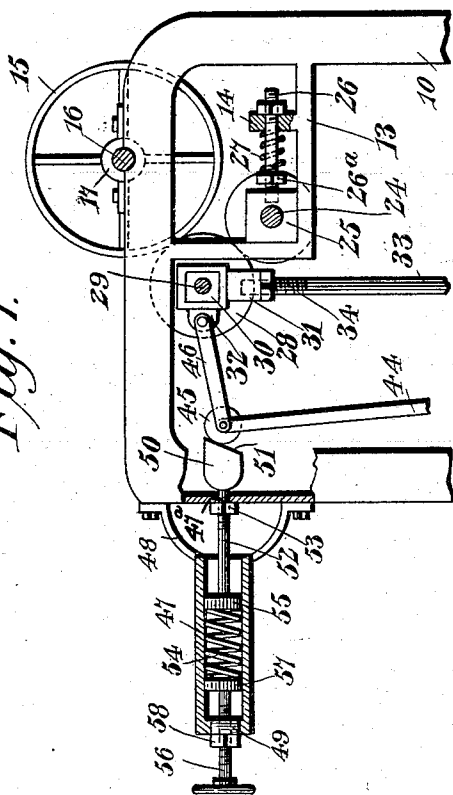


Fig. 6.

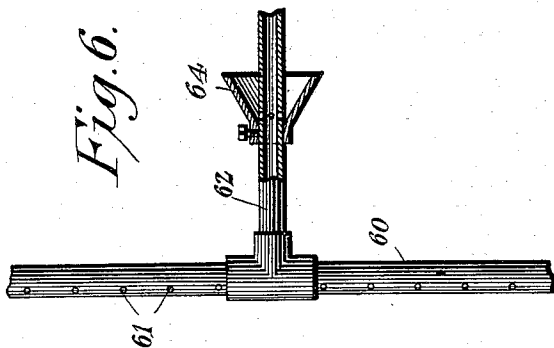
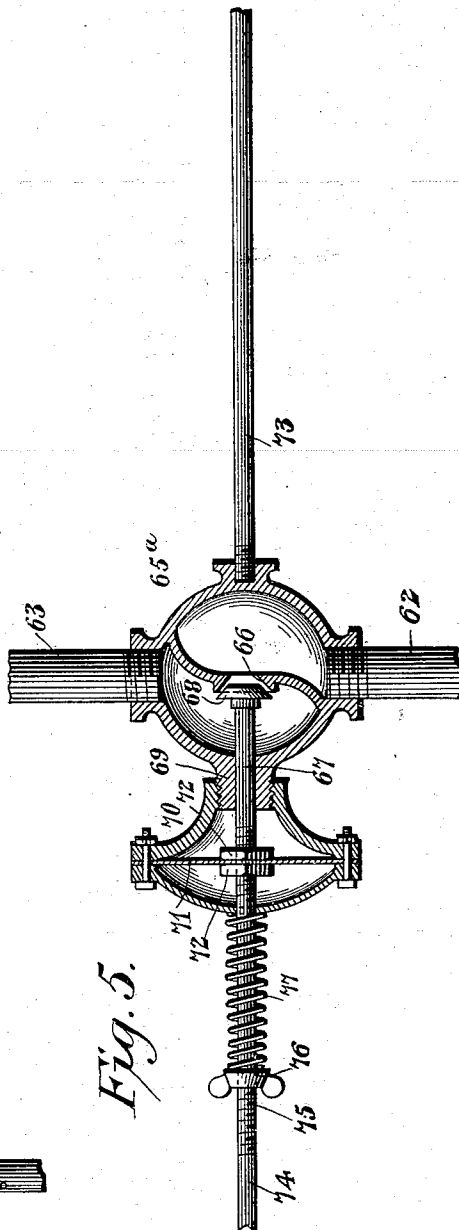


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM PHILO ROBERTS, OF PORTVILLE, NEW YORK.

LEATHER-IRONING MACHINE.

SPECIFICATION forming part of Letters Patent No. 637,669, dated November 21, 1899.

Application filed June 19, 1899. Serial No. 721,133. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PHILO ROBERTS, a citizen of the United States, residing at Portville, in the county of Cattaraugus and State of New York, have invented a new and useful Leather-Ironing Machine, of which the following is a specification.

My invention relates to machines for ironing leather by which I am able to effect material economy in the labor and cost of finishing hides and skins as compared with the common method of ironing them by hand and at the same time subject the skins or hides to such treatment by power-operated mechanism as will improve the appearance, feeling, and quality of the product, polish the surface, neutralize the fiber of the skin or leather, and produce a good finish thereon.

One object of the invention is to produce a set of rolls adapted to iron and polish the skin or hide, so as to attain the beneficial results above recited and also provide for ready separation of the rolls for the entrance or passage of the work.

A further object is to provide means for positively adjusting the pressure and polishing rolls to secure the requisite pressure on the work and compensate for wear of the spring-tension devices.

A further object is to provide a thermostatic regulator to control the heating appliance for the revoluble drum in a manner to automatically cut off the flow of fuel in the event of excessive heating of said drum and to increase the fuel-supply as the drum cools off.

A further object is to provide means for polishing the surface of the drum independently of the thermostatic heat-regulator; also, to protect the operator from direct radiation of the heat from said drum; also, to clean the drum from the refuse which may have a tendency to adhere thereto.

With these ends in view the invention consists in the novel combination of mechanisms and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated a preferred embodiment thereof in the accompanying drawings,

forming a part of this specification, and in which—

Figure 1 is a perspective view of a leather-ironing machine embodying the principles of my invention. Fig. 2 is an end elevation of the machine. Fig. 3 is a plan view with the casing for the heatable ironing-roll removed. Fig. 4 is a vertical transverse section of Fig. 3 on a line to the right of the gas-feed pipe. Fig. 5 is an enlarged sectional view through the thermostatic regulator. Fig. 6 is a detail section of the branch pipe with the air-inlet nozzle and showing portions of the branch pipe and burner-pipe in plan. Fig. 7 is an enlarged detail section through the tension devices for the elastic pressure-roll. Fig. 8 is a detail view of the scraper for the heatable ironing roll or drum.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

The framework of my machine consists of the end frames 10 11, each cast in a single piece and having the bridge-bars 12 and the cross-strut 13 preferably formed integral therewith, said struts 13 being provided with integral lugs 14, which serve to direct the guide-rods for the slidable polishing-roll, as will hereinafter appear. The end frames are arranged in parallel relation to bring the bridge-bars and struts in the same horizontal planes for the proper reception of the bearings for the set of coacting rolls; but it is evident that the framework may be modified within wide limits by a skilled mechanic without departing from the invention.

15 designates the heatable ironing roll or drum, which is preferably a hollow cylindrical structure, arranged in a horizontal position between the end frames, and this drum is provided with a longitudinal shaft 16, which is mounted in proper bearings 17 on the upper bridge-bars of the end frames. One end of the shaft is prolonged beyond its bearing for the reception of a spur-gear 18, which meshes with a gear-pinion 19^a on the short horizontal power-shaft 19. A bracket 20 is fixed to one of the end frames, and on this end frame and the bracket are provided shaft-bearings which receive the power-shaft 19. Said shaft is disposed parallel to the roll or

drum shaft and at one side thereof, so as to be geared directly thereto, and on the shaft 19 are fitted the fast and loose pulleys 22 22^a, around either of which may pass a driving-belt, (not shown,) whereby the heatable roll or drum may be driven by power from a line-shaft or an engine.

23 designates a metallic delivery-roll of cylindrical construction and arranged in a horizontal position below the heatable roll or drum 15, substantially parallel therewith; but this delivery-roll is disposed out of contact with the heatable roll or drum and it is arranged to coact with an elastic pressure-roll which has facial contact with the heatable ironing-roll, whereby the pressure-roll coöperates with the ironing and delivery rolls. The delivery-roll 23 has a shaft 24, which is journaled in slidable bearings 25. Said bearings are seated on the cross-struts 13, so as to slide thereon for adjusting the delivery-roll toward or from the periphery of the pressure-roll, and said bearings are guided in their slidable movement by means of guide-rods 26, which are loosely fitted in openings of the lugs 14. The guide-rods are externally threaded for the reception of adjusting-nuts 26^a, and coiled pressure-springs 27 loosely encircle the guide-rods between the nuts 26^a and the guide-lugs 14, whereby each spring has one end seated against one lug 14, while its opposite end bears against the nut 26^a. The tension of the springs is exerted on the nuts and the guide-rods to normally force the slidable bearings away from the lugs and toward the pressure-roll 28, so that the delivery-roll will have peripheral contact therewith. It is evident that the delivery-roll and its bearings are adapted to give or yield to permit the work to pass through the space between the delivery and pressure rolls, thus compressing the springs 27, which react to hold the delivery-roll in proper relation to the pressure-roll, and the tension of these springs may be regulated by adjusting the nuts 26^a on the threaded guide-rods, as will be readily understood by an inspection of Fig. 7.

The pressure-roll 28 is arranged in a horizontal position substantially parallel to the ironing and delivery rolls and on the front side of the machine, so as to lie in advance of said rolls. This pressure-roll is elastic, so as to be yieldable for proper coaction with the ironing and polishing rolls, and said pressure-roll is disposed for its axis to lie in a plane between the opposing faces of the two rolls 15 23. The elastic roll 28 is provided with a shaft 29, which extends beyond the elastic body of said roll, so as to be journaled in bearings 30, and these bearings and the pressure-roll are supported by devices which permit the roll to swing toward or from the ironing-roll and the delivery-roll for the ready passage of the work and to accommodate the machine to hides or skins of different thicknesses. The pressure-roll is arranged in such relation to the rolls 15 23 that it has intimate

facial contact with the ironing-roll and with the delivery-roll; but as will be seen by reference to Fig. 4 the metallic ironing and delivery rolls do not engage one with the other. Any suitable material may be employed in the construction of the elastic pressure-roll; but I have found by practical experience that rubber answers the purpose very satisfactorily. The bearings 30 for the pressure-roll are provided at their lower ends with internally-threaded sockets 31, and on the front sides of the bearings are the integral lugs 32. Swinging supporting-rods 33 are provided for holding the pressure-roll in proper relation to the ironing-roll and the delivery-roll, and these swinging rods are disposed at the sides of the machine for proper engagement with the bearings 30. Said swinging rods are provided with right and left hand threads 34 35 at the ends thereof, and the lower threaded ends of said rods are screwed into threaded sockets 37 of the foot-pieces 36, which are pivoted at 38 to the lower bridge-bars of the end frames. It will thus be seen that the upper ends of the rods have threaded engagement with the bearings 30, which support the pressure-roll, while their lower ends have threaded engagement with the foot-pieces 36, that are pivoted on the frame for holding the supporting devices for said roll 28 in a manner to permit the roll to swing back and forth toward the rolls 15 23. The rods 33 may be rotated in the threaded sockets of the bearings and foot-pieces for raising or lowering the bearings 30 and the roll 28, and as the swinging rods have right and left hand threads a very quick adjustment is provided for the bearings for the pressure-roll 28. The threaded ends of the swinging rods carry the check-nuts 39 40, adapted to be adjusted against the foot-pieces and the bearings to prevent accidental rotation of the rods in the threaded sockets, and thus the alinement of the pressure-roll may be preserved with relation to the ironing and delivery rolls.

For adjusting the pressure-roll horizontally relative to the rolls 15 23 I employ a foot-treadle 41, arranged at the front side of the machine-frame, and the ends of said treadle are fastened to arms 42, which are pivoted at 43 to the end frames 10 11. The inner ends of the treadle-arms 42 are connected to upright arms or levers 44, which extend from the arms 42 to the plane of the pressure-roll 28, and these arms or levers 44 carry the roller-shoes 45 and are connected by links 46 with the bearings 30 of the swinging pressure-roll. The links 46 are pivoted at their ends to the arms 44 and the lugs 32 of the pressure-roll bearings, while the roller-shoes 45 are journaled loosely or idly on pins or shafts connected to the upper extremities of the arms 44. Spring-housings 47 are provided on the front side of the end frames 10 11 in the horizontal plane of the roller-shoes 45, and each housing has a yoke 48 at its inner

end, said yoke being bolted firmly to one end of frame in order to support the housing in a fixed position on said frame. The spring-housing is provided at its outer end with a bearing-nut 49, adapted to accommodate a tension-screw, as will presently appear. The end frames 10 11 are provided with suitable openings 47^a in the horizontal plane of the roller-shoes 45, and in these openings are loosely fitted the adjustable plungers 50. Each plunger has its inner end formed with an inclined or cam face 51, which is presented in the path of one roller-shoe 45 for the latter to ride at all times against said face, and the plunger is, furthermore, provided with a threaded shaft 52, which extends through the yoke 48 and into the housing 47. The threaded shank of the plunger is equipped with a stop-nut 53, which is adapted to impinge against one end frame to limit the inward movement of the plunger, and access to this stop-nut may be obtained through the yoke 48 for rotating the nut to make it occupy different positions on the threaded stem of the plunger, whereby the cam-face of the plunger may be projected more or less beyond the inner edge of the end frame, so as to vary the travel of the roller-shoe thereon and permit the play or movement of the swinging bearings 30 for the pressure-roll. A spiral spring 54 is housed or contained within each housing 47, and one end of this spring acts against a slidable plate 55, which bears against the shank 52 of one plunger. A regulating-screw 56 is threaded into the bearing-nut 49 of each housing, and between the inner end of the screw and the outer end of the pressure-spring 54 is interposed a slidable plate 57. The regulating-screw has its protruding end provided with a suitable handle or wheel for convenient manipulation by hand, and this screw is held in place by means of a check-nut 58, which bears against a nut of the housing.

By reference to Fig. 2 it will be noted that the power-shaft 19 is disposed on one side of the ironing-roll 15, while the pressure-roll shaft 29 is in a plane on the opposite side of the ironing-roll, and that said ironing-roll is geared directly to the power-shaft, to be driven positively thereby. The pressure-roll is driven positively in the same direction as the ironing-roll by means of a gear 59, which is fixed to one end of the shaft 29 and meshes with an intermediate idler-gear 58^a, the latter being mounted loosely on a stud 58^b of the frame. This idler-gear meshes with a pinion 18^a on the end of the ironing-roll shaft 16 opposite to the power-shaft. The delivery-roll 23 is driven in an opposite direction to the pressure-roll 28 by means of a gear 23^a, which meshes directly with the gear 59^a on the opposite end of the roll-shaft 29 from the gear 59. The pressure-roll is thus adapted to yield to the work as it passes between the rolls 15 28, and the rods 33 support the pressure-roll in position to swing toward or from the plungers 50. The movement of the bearings 30

for the pressure-roll is communicated by the links 46 to the arms 44, which are connected with the treadle, and any movement of the arms 44 and bearings 30 toward the front side of the machine causes the roller-shoes 45 to travel against the cam-faces 51 of the plungers 50, thus forcing the plungers against the tension of the springs into the housings, the stop-nuts 53 traveling with the plungers. The springs 54 act against the plungers in a manner to force the roller-shoes, links, and bearings toward the rear of the frame in order to hold the pressure-roll in proper operative relation to the ironing-roll and the delivery-roll, and the pressure of said springs may be varied by proper manipulation of the regulating-screws 56. The treadle may be depressed to make the roller-shoes ride against the plungers, which yield or give to the forward movement of the pressure-roll, which is adapted to be separated from the ironing-roll and the delivery-roll for the introduction of the work into the machine, but normally the spring-actuated plungers hold the pressure-roll up to the work through the train of connections heretofore described. By giving the plungers the inclined or cam faces and making them yieldable to the forward travel of the roller-shoes when the pressure-roll is moved by depressing the treadle the parts are disposed to permit a very slight movement of the treadle to effect the separation of the pressure-roll from the delivery-roll and the ironing-roll, so that the work may be quickly introduced between said rolls. It will thus be seen that the pressure-roll is normally maintained under yieldable spring-pressure in proper operative relation to the other rolls, that the pressure-roll may be easily and quickly controlled by a manually-operative foot-treadle, and that all the rolls are properly driven in order to carry the work through the machine.

I will now proceed to describe the heating appliances by which the metallic ironing-roll 15 is kept at the proper temperature for treating the leather or skins, and these heating appliances embrace a thermostatic regulator adapted to keep the roll at the proper temperature for effecting the proper treatment of the leather.

A burner-pipe 60 is arranged in a horizontal position below the axis of the ironing-roll 15 and at the rear side of said roll. Said burner-pipe is provided in its front side with a series of inclined flame-openings 61, adapted to project the jets or flame directly against the metallic ironing-roll, and to this burner-pipe is attached a branch pipe 62 of the gas-supply pipe 63, said branch pipe lying in a horizontal position at the rear side of the frame and arranged centrally with relation to the burner-pipe, which extends the full length of the ironing-roll and in close relation to the rear side thereof. The branch pipe 62 is provided at a point intermediate of its length with an air-inlet cone 64, which en-

ables atmospheric air to enter the branch pipe for the proper admixture of the air with the gaseous fuel to attain maximum combustion of the fuel at the flame-openings of the burner-pipe. The gas-supply pipe 63 is provided above the valve of the thermostatic regulator with a controlling-cock 65, which may be in the form of a globe-valve and have its stem provided with a hand-wheel adapted to be manually operated for opening and closing the cock for admitting and cutting off the supply of gaseous fuel to the burner.

One element of the thermostatic regulator is an automatic valve which is connected to the gas-supply pipe 63 at a point between the stop-cock 65 and the branch pipe 62, and this automatic valve has a shell 65^a, which is provided with a seat 66, said seat being either flat or tapered, as desired. The shell 65^a of the automatic valve is provided at one end with a hollow male-threaded nipple 69, and through this nipple passes the stem 67, which at its inner end is furnished with a valve-head 68, adapted to fit the seat 66 of the valve-shell. To the nipple 69 of the automatic valve-shell 65^a is screwed a two-part or divided casing 70, and the members of this casing are adapted to clamp a diaphragm 71 between their meeting edges. This casing and its diaphragm do not have any effect in controlling the movement of the valve, but they are provided merely for the purpose of preventing leakage of gas through the nipple 69, which loosely receives the stem of the automatic valve, thus overcoming any leakage of gaseous fuel from the supply devices on the machine. The valve-stem 67 passes through the nipple 69, so as to play freely therein, and said stem also passes through the diaphragm 71. The stem is threaded within the two-part casing 70 for the reception of nuts 72, which bear against opposite sides of the diaphragm 71, thus making the diaphragm movable with the valve-stem. A horizontal rod 73 is screwed to the closed side of the valve-casing 65^a, and a rod 74 passes loosely through the outer member of the two-part casing 70, so as to form a continuation of the valve-stem 67. If desired, the stem 67 and rod 74 may be in one piece, as shown by the drawings; but if two pieces are employed the stem and rod should be coupled firmly together. The rods 73 74 extend from the automatic valve in planes parallel with the axis of the metallic ironing-roll, and the combined length of said rods, with the interposed automatic valve, exceeds the length of the ironing-roll, so that the ends of the rods will project somewhat beyond the ends of the roll 15. The rod 74 is threaded, as at 75, near the two-part casing on the automatic valve, and on this threaded part of the rod is screwed a thumb-nut 76. A coiled spring 77 loosely encircles the threaded part of the rod 74, and one end of this spring is seated against the diaphragm-casing, while the other end acts against the nut 76, so as to force the rod 74 and valve-stems 67 in a di-

rection to normally hold the valve-head 68 free from contact with the seat in the casing 65^a of the automatic valve.

78 indicates a non-expansible rod or bar made of any suitable material, such as wood, which will not be materially affected by the heat radiated from the ironing-roller 15. A metallic tip 79 is connected or attached to one end of this non-expansible rod, and the rod is inclosed within a metallic sheath or jacket 80, which extends the full length of said rod and has one end attached or secured to the metallic tip 79. This non-expansible rod and its metallic jacket are arranged between the automatic valve and the heated ironing-roll, and the metallic jacket is fitted loosely around the non-expansible rod, so as to provide an intermediate air-space between the rod and its jacket, whereby the jacket serves in a measure to protect the rod against the action of the heat radiated from the drum, and the air-space has the circulation of air around the rod 78. This rod and its jacket may rest on or be supported by the framework of the machine, and they provide the support for the levers 82 83, which are connected operatively with the rods 73 74 and are adapted to have contact with the ends of the heated ironing-roll.

The ironing-roll will expand in the direction of its length according to the temperature of the roll, and this adaptation is availed of for the operation of the valve constituting one element of the thermostatic regulator. The levers 82 83 extend forwardly from the ends of the rods 73 74, so as to terminate contiguous to the ends of the ironing-roll 15. One lever 82 is fulcrumed at a point intermediate of its length, as at 84, on the metallic tip 79, and the rear end of said lever 82 is pivoted at 85 to the rod 73. The other lever 83 is provided at a point intermediate of its length with a slot 86, which is fitted loosely on a stem 81, that is arranged in alinement substantially with the non-expansible rod 78 and is connected pivotally thereto, as at 87. The rear end of the lever 83 is pivoted at 87^a to the head 74, and against the lever 83 bears a coiled spring 88, which loosely encircles the stem 81, the latter being externally threaded, practically throughout its length, as shown by Fig. 3. Against one end of the coiled spring 88 bears a tension-nut 90, which is screwed on the threaded stem 81 and is adapted to compress the spring 88 for regulating the tension thereof and to force the lever 83 away from the lever 82. An adjusting-nut 89 is screwed on the threaded stem 81 outside of the lever 83, so as to bear against the latter and limit the play of said lever with relation to the nut 90, and thus the lever 83 is loosely confined on a threaded stem 81, which is attached to a non-expansible rod, so that the lever 83 will have a limited movement or play on the threaded rod to make it work in unison with the lever 82. The forward ends of the levers 82 83 carry the

roller-shoes 91, which are loosely mounted on said levers and are disposed to have rolling engagement with the ends of the heatable drum or roll 15. The tension of the spring 77 is exerted against the rod 74 to hold the valve 68 free from the seat in the valve-shell and to force the levers 82 83 into position where the roller-shoes will ride against the ends of the ironing-roll 15. As the roll cools off the spring 77 acts against the diaphragm and valve and the rod 74 to move the levers 82 83 into positions where the shoes 91 will adhere to the ends of the ironing-roll 15, and thus open the valve 68 for the fuel to pass from the pipe 63 to the branch pipe 62, and thence to the burner-pipe 60. On the increase in temperature of the roll which is heated by the flame from the burner-pipe the roll 15 will expand lengthwise and move the shoes 91 away from each other, so that the levers 82 83 will be actuated to move the rods 73 74 inwardly toward one another against the tension of the spring 77, thus reducing the passage through the valve 66 or entirely cutting off the flow of gaseous fuel to the burner. The levers 82 83 are connected to the non-expansible rod, which is not affected or influenced by the heat of the ironing-roll 15, and thus the levers are supported by a device which remains constantly in one position against any tendency to expand, while the roll 15 may vary in length according to the temperature thereof, so that the levers will play or move under expansion of the drum while the fulcrum-points of the levers are on a non-expansible support.

I have also equipped the gas-supply devices with means by which the gas may be permitted to flow uninterruptedly to the burner and independently of the thermostatic valved device, so that in the event of closure of the automatic valve by the roller when it is at a high temperature the fuel may pass to the burner for the purpose of preventing the gas being turned off entirely by the closure of the automatic valve. This end is attained by the employment of a by-pass around the automatic valve of the thermostatic device, and this by-pass is embodied in the form of a pipe 92, which has its ends attached to the supply-pipe 63 on opposite sides of the automatic valve 65^a, said pipe 92 being provided with a globe-valve 93. It will be understood that the gas may pass through the automatic valve 65^a to the burner for the purpose of heating the ironing-roll above the slight degree of heat that is imparted to the roll by the small amount of gas that is permitted to constantly escape through the by-pass. In this manner the surface of the ironing-roll is held at the desired degree of temperature without any danger of the gas failing to ignite if the valve 65^a should be closed entirely by the excessive heat and then be opened again when the temperature of the ironing-roll falls below the degree of heat necessary to close the valve.

To protect the operator from the effects of the heat radiated from the hot ironing-roll 15, I provide a casing 94, which is attached to the framework of the machine and which is of segmental form, so as to partly inclose the ironing-roll 15, and the rear part of this casing is extended downwardly to form an apron 95 at the rear side of the ironing-roll and to partly house the burner at 60. This casing is provided at its upper side with a nipple 95^a, to which may be fitted an off-bearing pipe (not shown) adapted to convey the hot air away from the casing.

In order to keep the surface of the ironing-roll free from accumulation of refuse, I provide means for mechanically scraping the roll in order to clear obstructions therefrom. This clearing means is embodied in the form of a scraper-blade 96, which is disposed below the roll 15 and in an inclined position to the vertical diameter thereof, so that the working edge of the scraper will be presented in contact with the lower face of the roll 15. This scraper is fitted in the groove of a jaw 98, and which jaw is secured to the struts 13 through the medium of screws passed through the struts and into the ends of the jaw. Formed transversely of the jaw and opening into the groove thereof are elongated slots or perforations 98^a, corresponding perforations being formed in the scraper. Through these corresponding perforations are passed bolts 99, having clamping-nuts, whereby the scraper may be held firmly with relation to the jaw and may also be loosened, the elongated slots or perforations permitting adjustment of the scraper in the jaw.

The operation may be described as follows: The gaseous fuel is admitted to the burner for heating the ironing-roll 15, and power is applied to the shaft 19 for rotating all of the rolls 15 23 28 of the machine, the roll 28 moving in an opposite direction to the roll 15 at the point of contact, but in the same direction with the roll 23. The leather or hide is passed through the space between the rolls 28 15, and thence between the rolls 23 28, and both surfaces of the skin or hide are thus subjected to the action of the pressure-roll, the heated ironing-roll, and the delivery-roll. The pressure between the heated ironing-roll and the elastic pressure-roll is sufficient to smooth and compact the fibers of the leather or skin, and as the pressure-roll is pressed into contact with the ironing-roll the surface of the leather is polished, thus producing a superior grade of leather or skin. The expansion of the heated ironing-roll operates the levers 82 83 to close the valve of the thermostatic regulator when the temperature of the roll 15 reaches the desired point, and thus the flow of gaseous fuel is controlled or shut off, according to the temperature of the roll 15. The hood or casing prevents direct radiation of the heat from the roll 15, and the scraper keeps the surface of the roll in a clean condition. The tension of the springs on the bearings of the slidable

delivery-roll may be regulated as found desirable in the service of the machine, and in like manner the tension of the springs on the bearings of the swinging pressure-roll may be varied as shown necessary.

I desire to call attention to the peculiar method of driving the several gears for the purpose of rotating the ironing-roll 15 and the pressure-roll 28 in the same axial direction and for rotating the delivery-roll 23 in an opposite direction to both of the rolls 15 28, while the ironing-roll is given a greater peripheral speed than the pressure-roll. The ironing-roll is driven by the power-shaft 19, geared to one end thereof, and at its opposite end this ironing-roll has a small gear-pinion 18^a, which drives a larger idler-gear 58^a, which in turn drives a still larger gear 59 on the same end of the pressure-roll shaft. The described gearing propels the pressure-roll in the opposite peripheral direction from and at as lower speed than the ironing-roll, and thus the hide or skin is subjected to a frictional rubbing action from the heatable ironing-roll, whereby the surface of the hide or leather is ironed to improve the quality thereof. The delivery-roll 23 is driven by gears 23^a 59^a from the pressure-roll at one end, and this roll 23 is thus made to coact with the roll 28 to draw the hide or skin through the machine.

Changes may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what I claim is—

1. In a leather-ironing machine, the combination of a heatable ironing-roll, an elastic pressure-roll, and a delivery-roll, said pressure-roll being in operative relation to the ironing and delivery rolls and driven to rotate in an opposite direction to the delivery-roll and the same direction with the pressure-roll, substantially as described.

2. In a leather-ironing machine, the combination of a heatable ironing-roll, an elastic pressure-roll geared thereto for rotation in the same direction and arranged to coact with said ironing-roll, and a delivery-roll geared to the pressure-roll to rotate in an opposite direction thereto and arranged in operative relation to the same, said pressure-roll being yieldable with relation to the ironing and delivery rolls, substantially as described.

3. In a leather-ironing machine, the combination of a heatable ironing-roll, a pressure-roll coacting therewith and rotating in the same direction therewith, means for permitting the pressure-roll to move bodily with relation to the ironing-roll, and a delivery-roll coacting with and rotating in an opposite direction to the pressure-roll, said deliv-

ery-roll being supported in yieldable relation to the pressure-roll, substantially as described.

4. In a leather-ironing machine, the combination of a heatable ironing-roll, a yieldable pressure-roll coacting with and rotating in the same direction with said ironing-roll, a delivery-roll coacting with and rotating in an opposite direction to the pressure-roll, slidable bearings in which the delivery-roll is journaled, and tension devices for normally holding the delivery-roll in active relation to the pressure-roll, substantially as described.

5. In a leather-ironing machine, the combination of a heatable ironing-roll, a delivery-roll, an elastic pressure-roll in active relation to and rotating in the same direction with the ironing-roll, swinging arms for supporting the pressure-roll in position, and tension devices for normally pressing said pressure-roll toward the ironing-roll, substantially as described.

6. In a leather-ironing machine, the combination, with an ironing-roll, of a delivery-roll adjacent thereto, a pressure-roll in constant contact with the delivery-roll and movable into and out of contact with the ironing-roll, the peripheries of the ironing and pressure rolls moving in opposite directions at the point of contact, and means for moving the pressure-roll and for varying its pressure against the ironing-roll.

7. In a leather-ironing machine, the combination, with an ironing-roll, of a delivery-roll adjacent thereto, a pressure-roll in variable contact with said rolls, a spring for holding the delivery and pressure rolls in yielding constant contact, and a treadle connected to the pressure-roll by intermediate links for moving the pressure-roll toward and from said ironing and delivery rolls, the peripheries of the pressure and the ironing rolls moving in opposite directions at the point of contact.

8. In a leather-ironing machine, the combination of a set of ironing and pressure rolls, swinging bearings for said pressure-roll, means for manually adjusting said bearings to move the pressure-roll away from the ironing-roll, and a tension device to normally hold the pressure-roll in active relation to the ironing-roll, substantially as described.

9. In a leather-ironing machine, the combination of a heatable ironing-roll, swinging arms provided with journal-bearings, a pressure-roll journaled in said bearings to travel with said arms, wheel-shoes movable with said bearings, and spring-actuated plungers having the cam-faces in the path of said shoes for the latter to ride thereon, substantially as described.

10. In a leather-ironing machine, the combination of a heatable ironing-roll, adjustable bearings carrying a pressure-roll, manually-operative devices connected with said adjustable bearings, wheel-shoes movable with the bearings and the adjusting devices therefor, and cam-faced plungers engaging

with the wheel-shoes, for the purpose described, substantially as set forth.

11. In a leather-ironing machine, the combination of a heatable ironing-roll, a pressure-roll, swinging arms having bearings for said pressure-roll, treadle mechanism connected with said swinging bearings, spring-actuated plungers contiguous to said bearings and provided with cam-faces, and wheel-shoes mounted to travel with the bearings and to ride against the cam-faces of said plungers, substantially as described.

12. In a leather-ironing machine, the combination with an ironing-roll, and a pressure-roll, of adjusting-bearings for said pressure-roll, links secured to the bearings the cam-faced plungers slidably confined contiguous to said bearings, wheel-shoes secured to the links and arranged to ride against the cam-faces of said plungers, pusher-springs to normally impel the plungers in one direction, tension-regulating devices for said springs, and means for moving the wheel-shoe over the cam-faces to move the pressure-roll in the direction of the ironing-roll, substantially as described.

13. In a leather-ironing machine, the combination with a heatable ironing-roll, and a pressure-roll, of swinging bearings for said pressure-roll, a treadle mechanism connected with said bearings, the fixed spring-housings having the yokes, the plungers slidably confined in said housings and having the cam-faces, wheel-shoes movable with the bearings and riding against said plungers, the stop-nuts adjustable on the plungers, tension-springs confined within the housings and acting against the plungers, and the regulating-screws mounted in the housings in active relation to the springs, substantially as described.

14. In a leather-ironing machine, the combination with a heatable ironing-roll and a pressure-roll, of adjustable bearings for said roll, swinging arms for supporting said bearings, a treadle having the upright arms, links connecting said upright arms with the pressure-roll bearings, wheel-shoes journaled on the upright arms, and spring-actuated plungers having the cam-faces against which the wheel-shoes are adapted to ride, substantially as described.

15. In a leather-ironing machine, the combination with a heatable ironing-roll, of a swinging pressure-roll, bearings in which said pressure-roll is journaled, pivoted foot-pieces on the machine-frame, threaded rods having adjustable connection with the bearings and foot-pieces, and means for adjusting said bearings, substantially as described.

16. In a leather-ironing machine, the combination with a heatable ironing-roll, of a burner contiguous to said roll, and a thermostatic regulator including an automatic valve and engaging operatively with said roll to automatically close and open the valve in unison with the expansion or contraction of said ironing-roll, substantially as described.

17. In a leather-ironing machine, the combination with a heatable ironing-roll, of a burner contiguous thereto, a supply-pipe to said burner, an automatic valve in said supply-pipe, and thermostatic regulator devices in active relation to the heatable ironing-roll and connected operatively with said automatic valve to open or close the latter according to the expansion or contraction of the ironing-roll, substantially as described.

18. In a leather-ironing machine, the combination of a burner and a heatable ironing-roll in the zone of heat of the burner, of a supply-pipe to said burner, an automatic valve in said supply-pipe, a non-expansible support adjacent to the ironing-roll, and levers mounted on said non-expansible support for active engagement with the ends of the heatable roll and connected operatively with the automatic valve to open and close the latter in unison with the expansion and contraction of said roll, substantially as described.

19. In a leather-ironing machine, the combination with a heatable ironing-roll and a burner contiguous thereto, of a supply-pipe, an automatic valve therein, a non-expansible rod, levers mounted on said rod and having shoes arranged to ride against the ends of said heatable roll, and link connections between said levers and the automatic valve, substantially as described.

20. In a leather-ironing machine, the combination with a heatable roll and a burner contiguous thereto, of a supply-pipe, an automatic valve therein, rods connected to the valve-casing and the valve-head and extending in opposite directions therefrom, a spring connected to one of said rods and operating to normally open the valve, a non-expansible rod, and levers supported by said non-expansible rod and connected with the valve-rods, said levers having their free ends contiguous to the ends of the heatable roll, substantially as described.

21. In a leather-ironing machine, the combination with a heatable roll and a burner contiguous thereto, of a supply-pipe connected to said burner, an automatic valve in said supply-pipe, a non-expansible rod, levers mounted on said non-expansible rod and connected with the automatic valve, and a tension device between one of said levers and the non-expansible rod to normally separate the levers, substantially as described.

22. In a leather-ironing machine, the combination with a heatable roll, a burner, and a supply-pipe therefor, of an automatic valve in said pipe, a stationary and a longitudinally-movable rod connected with said valve, a non-expansible rod, a threaded rod attached to said non-expansible rod, levers mounted at their ends on the stationary and longitudinally-movable rods and at their intermediate portions on the non-expansible rod and the threaded stem thereof respectively, a spring fitted on said stem to bear against one of said levers, independently-adjustable nuts fitted

on the threaded stem and bearing against one lever and the spring respectively; and a thermostatic element in operative relation to the levers and lying in the zone of heat of the burner to be operated thereby, substantially as described.

23. In a leather-ironing machine, the combination with a heatable roll, a burner contiguous thereto, and a supply-pipe for said burner, of an automatic valve in said supply-pipe, a diaphragm-casing coupled to said valve, a rod connected to the valve-shell, another rod passing through the diaphragm-casing and having a valve-head, a collar or nut on the last-named rod, a spring acting against said collar to open the valve, a non-expansible rod having a jacket and a tip at one end, a threaded stem connected to the other end of said non-expansible rod, levers fitted to the tip and threaded stem respectively and having the wheel-shoes engaging with the roll and connected with the rod of the valve, a spring on the threaded stem, and adjustable nuts screwed on the said stem and engaging with the spring and one lever respectively, substantially as described.

24. In a leather-ironing machine, the combination with a heatable roll, a burner, and a gas-pipe connected to said burner, of a thermostatic regulator including an automatic valve in operative relation to the ends of said heatable roll, and a by-pass around the automatic valve, substantially as described.

25. In a leather-ironing machine, the combination with a heatable roll, a burner, a sup-

ply-pipe, and an automatic valve, of a thermostatic regulator connected with said valve and in operative relation to said roll, and a valved by-pass connected to said pipe on opposite sides of the automatic valve, substantially as described.

26. In a leather-ironing machine, the combination of a heatable roll, pressure and delivery rolls coacting with the heatable roll and with one another, a casing partly inclosing the heatable roll and having a vent, and a burner partly inclosed by said apron and arranged contiguous to the heatable roll, substantially as described.

27. In a leather-ironing machine, the combination of a heatable ironing-roll, a pressure-roll coacting therewith, a delivery-roll in active relation with the pressure-roll, means for driving the pressure-roll in the same direction with the ironing-roll and in an opposite direction to the delivery-roll, a jaw arranged below the ironing-roll and in rear of the delivery-roll, and a scraper clamped adjustably in said jaw and disposed in contact with the surface of the ironing-roll in rear of the pressure and delivery rolls, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM PHILO ROBERTS.

Witnesses:

J. T. JAMES,

C. A. ROBERTS.