

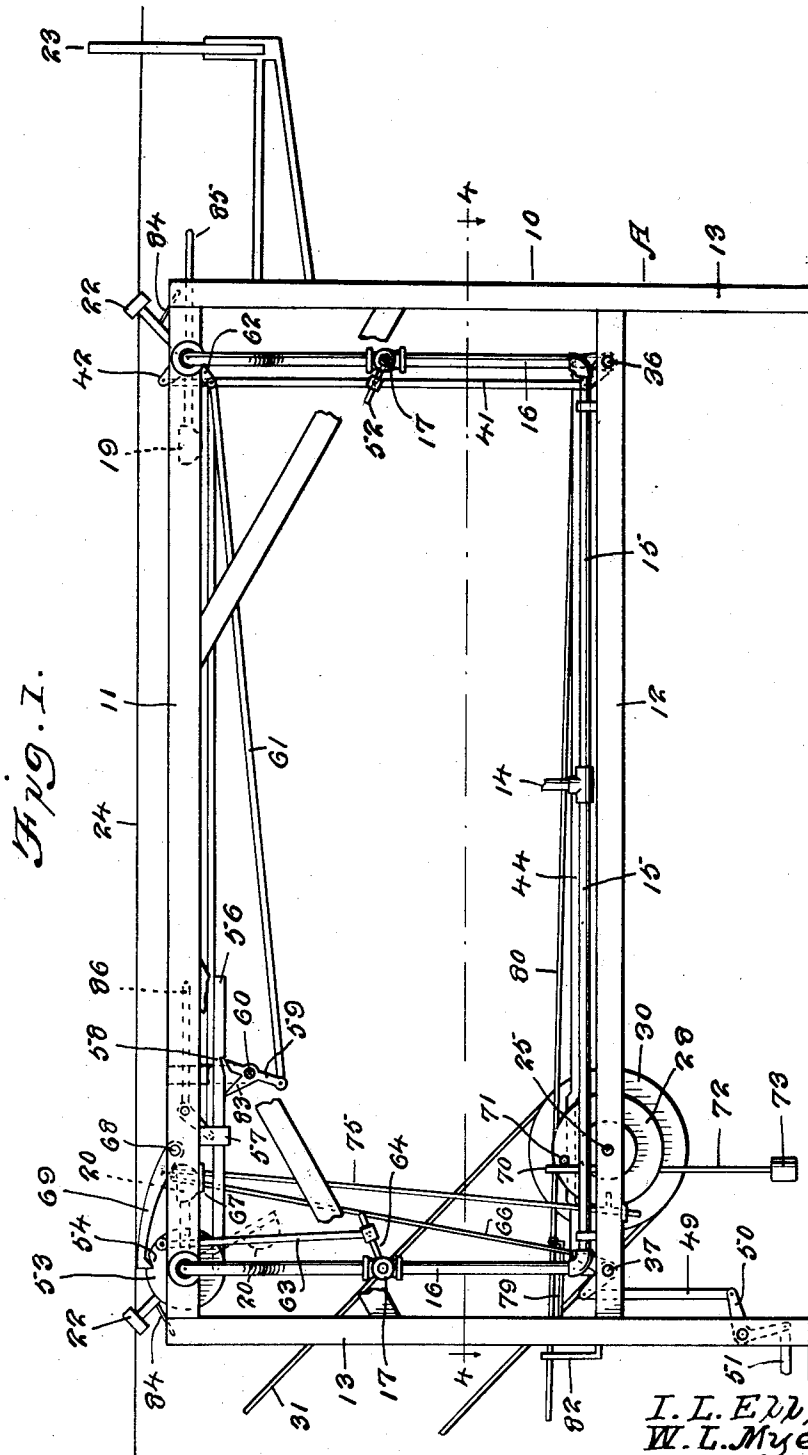
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I. L. ELLIOTT ET AL
AUTOMATIC SINGING MACHINE

1,928,973

Filed Oct. 10, 1932

5 Sheets-Sheet 1



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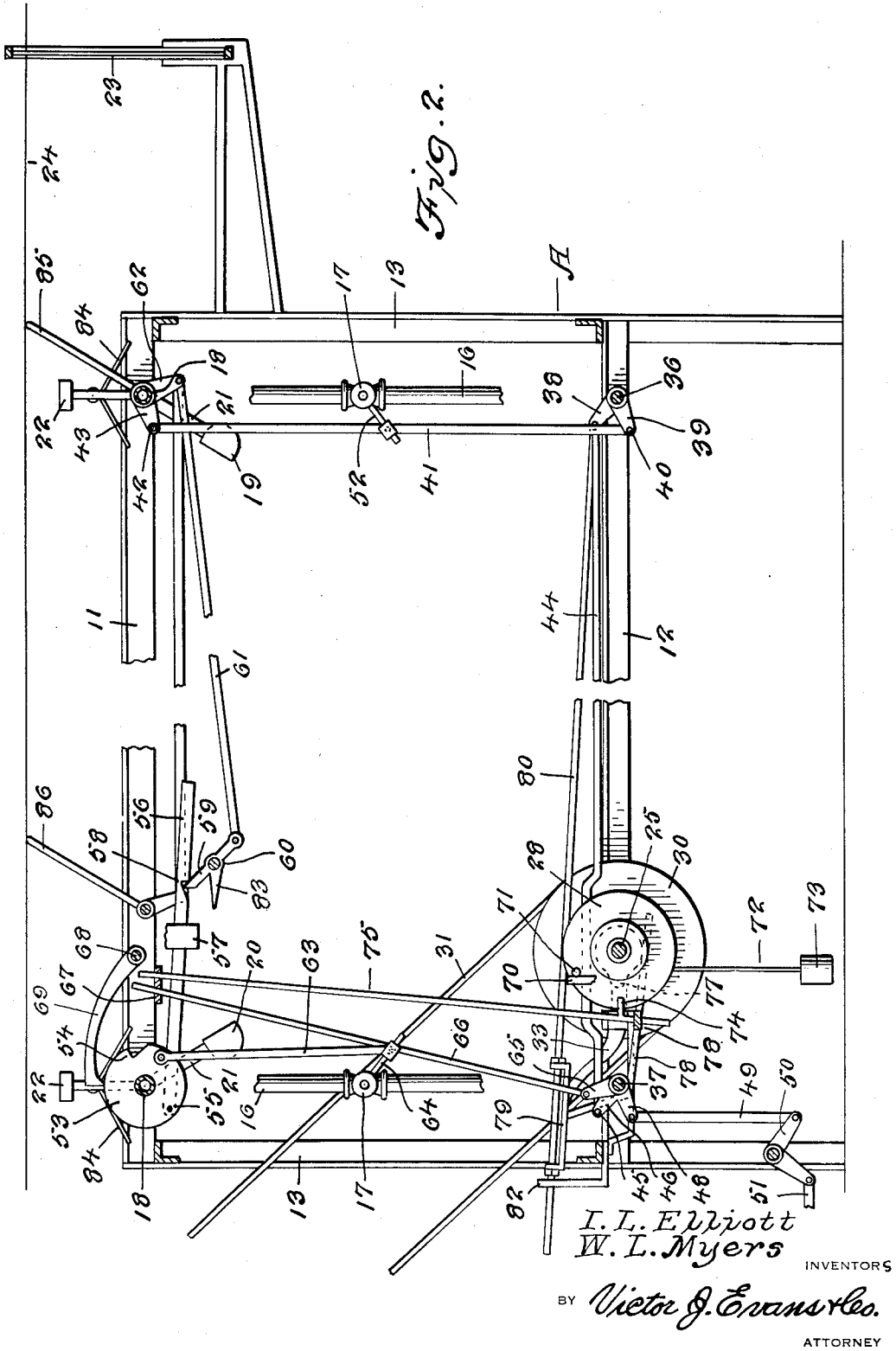
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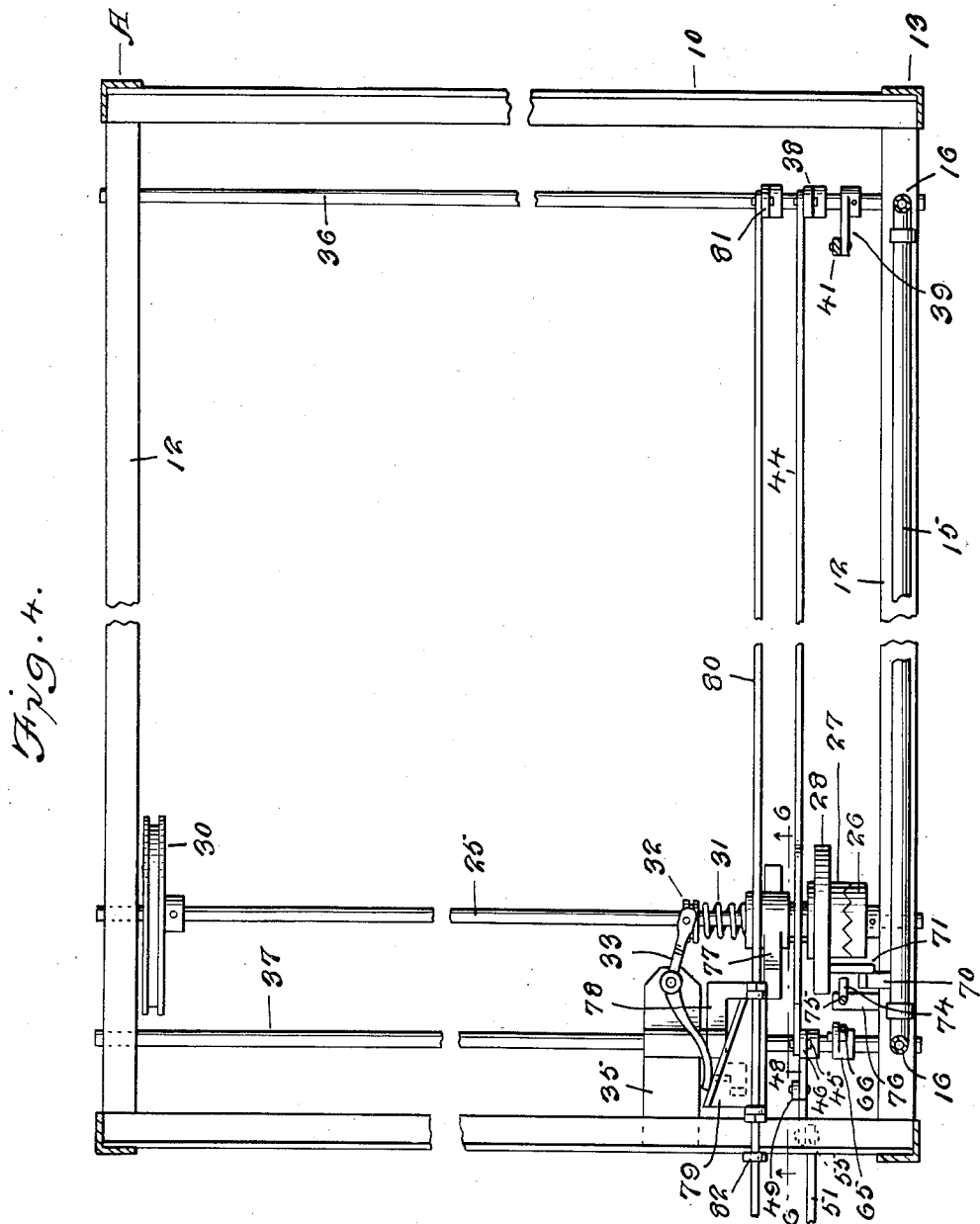
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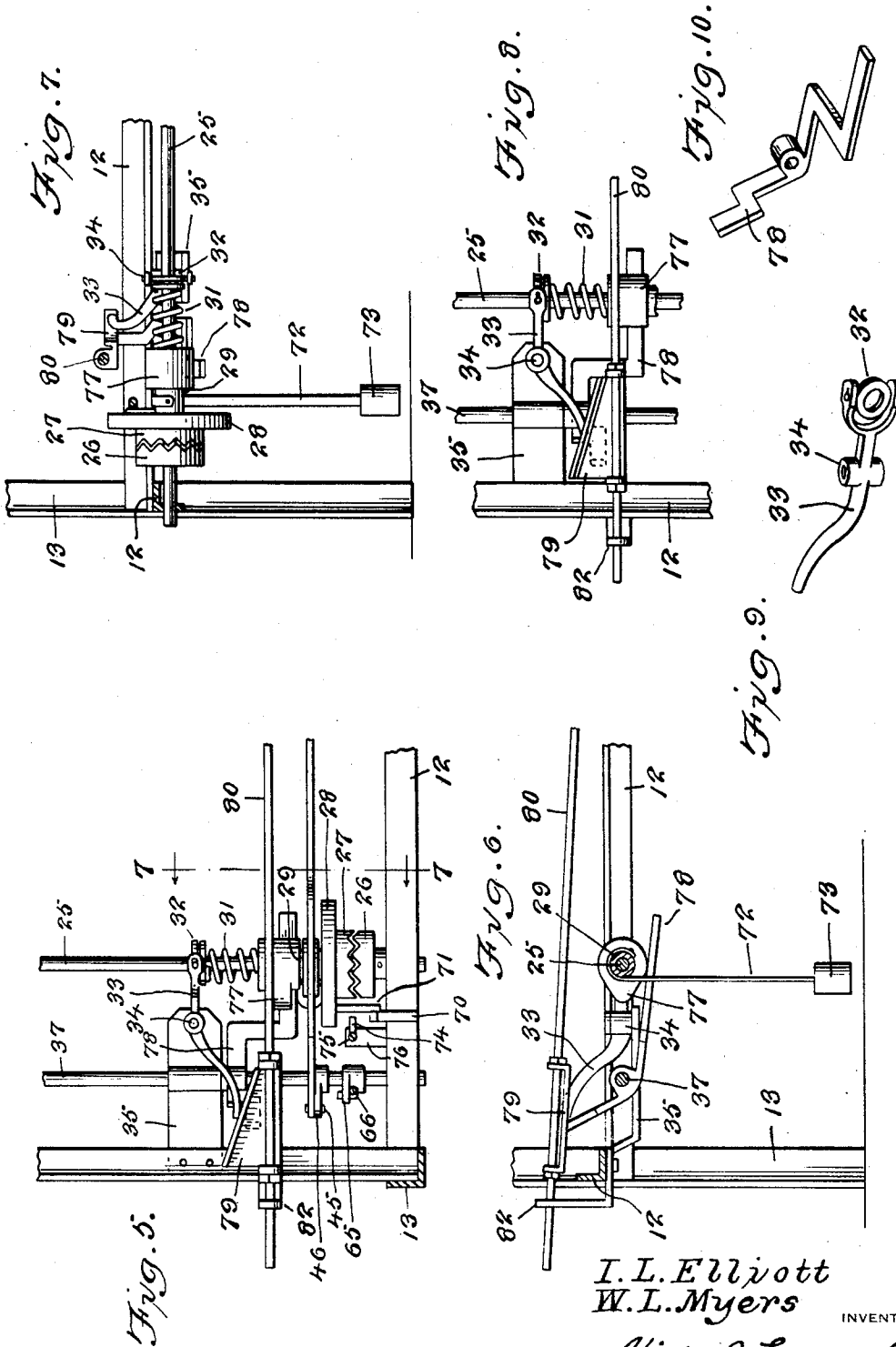
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AUTOMATIC SINGING MACHINE

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UNITED STATES PATENT OFFICE

1,928,973

AUTOMATIC SINGEING MACHINE

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7 Claims. (Cl. 28—63)

The invention relates to a singeing machine and more especially to an automatic singeing machine for yarn, thread, cloth or other material.

The primary object of the invention is the provision of a machine of this character wherein two sets of burners are employed, one of which burns from the time the machine is started until it is stopped, the other burns until the unsinged portion has passed over the first burner and has been singed, whereupon the second burner is automatically turned down to non-singeing position and upon the stopping of the machine the fuel is partially cut off and the yarn or thread or other material operated upon is raised from the burners and protected therefrom automatically by the use of shields.

Another object of the invention is the provision of a machine of this character wherein material to be singed is moved over burners, these being automatically controlled so as to efficiently remove the lint and trim the loose projecting fibers from the surface of the threads or other material, the machine in its entirety being of novel construction and automatically operated, thereby eliminating any manual control of such machine.

A further object of the invention is the provision of a machine of this character, wherein the same is operated either directly by a warp machine or may be driven independently thereof and will singe threads, yarns, cloth or the like so as to remove therefrom lint, fluff or loose particles, the thread or other material operated upon being protected so as to avoid burning or scorching thereof should the feed of the material be stopped during the singeing operation of the machine.

A still further object of the invention is the provision of a machine of this character wherein the feed to the burners and also the burners are automatically controlled in a novel manner and during the singeing operation the burners are automatically moved to the work and the fuel thereto regulated and upon the stopping of the machine the work is automatically lifted while the burners are retracted to non-singeing position.

A still further object of the invention is the provision of a machine of this character which is comparatively simple in construction, thoroughly reliable and efficient in operation, automatic in its action, strong, durable, and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction,

combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a side elevation of the machine constructed in accordance with the invention, the parts thereof being adjusted automatically for the singeing operation of the machine.

Figure 2 is a vertical longitudinal sectional view through the machine showing the parts thereof in normal position with the burners lowered to non-singeing position and the work elevated.

Figure 3 is a top plan view of the machine with the parts thereof in the position as shown in Figure 1 of the drawings.

Figure 4 is a sectional view on the line 4—4 of Figure 1 looking in the direction of the arrows.

Figure 5 is a fragmentary horizontal sectional view showing the clutch mechanism and its control of the machine.

Figure 6 is a sectional view on the line 6—6 of Figure 4 looking in the direction of the arrows.

Figure 7 is a sectional view on the line 7—7 of Figure 5 looking in the direction of the arrows.

Figure 8 is a view similar to Figure 5 with certain parts eliminated and showing the clutch mechanism released.

Figure 9 is a perspective view of the clutch lever.

Figure 10 is a perspective view of the releasing member for the clutch lever.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, the machine comprises a stand A in the form of a frame 10 having the upper and lower longitudinal side bars or rails 11 and 12 respectively and the vertical supporting legs 13. Within this frame 10 is mounted a gas supply pipe 14 leading from any suitable source of supply and is provided with the branches 15, the vertical stretches 16 of which have fitted therein turn valves 17, these being automatically operated to vary the flow of gas through said branches 15 for a purpose presently described.

Journalled in the upper side rails 11 of the frame 10 near opposite ends of the latter are the hollow axles 18 for swinging gas burners 19 and 20 respectively and communicating with these axles 18 are the vertical stretches 16 of the

branches 15 from the supply pipe 14 so that fuel can be fed to the burners. The burners 19 and 20 each have short pipe connections 21 with its hollow axle 18. The hollow axles 18 each is
5 fitted with weighted balancing arms 22.

Arranged at the right hand end of the frame 10 is a work guide 23 and in this instance there is trained therethrough warp threads 24, these being fed into a warp machine (not shown) with
10 which the singeing machine is to be associated. The feed of the threads 24 is in the direction from the right hand end to the left hand end of the frame 10 above the top thereof, while the burners 19 and 20 are disposed transversely of
15 this frame and are adapted to be swung into operative position with respect to the threads 24 when being fed to the warp machine in a manner presently described.

Journalled in the lower side bars 12 next to the left hand end of the frame 10 is a power driven shaft 25 having fitted therewith a clutch including the members 26 and 27 thereof. The member 26 of the clutch is made fast to the shaft 25 while the member 27 is normally loose upon the shaft
20 and has integrally formed therewith a disk 28 and a hub 29 forming a windlass while the shaft 25 has fixed thereto a belt wheel 30 having trained thereover a belt 31, the latter being driven directly from the warp machine (not shown) or
30 from any other suitable source of power. Loosely surrounding the shaft 25 is a coiled tensioning spring 31, the same being disposed between the windlass 29 and the slide ring 32 loose on said shaft and connected with a clutch throw lever
35 33 pivoted at 34 to a bracket 35 stationarily arranged in the frame 10. This clutch lever 33 when shifted in one direction tensions the spring 31 so as to move the member 27 into engagement with the member 26 of the clutch so that
40 power from the belt wheel 30 will be transmitted through said shaft 25, members 26 and 27 of the clutch to the disk 28 and the windlass 29 for a purpose presently described.

Suitably journalled in the side rails or bars 12 of the frame 10 are the rocking shafts 36 and 37 respectively and this shaft 36 has fixed thereto the crank arms 38 and 39, the latter having pivoted at 40 thereto a link 41 which is also pivoted at 42 to the crank arm 43 on the hollow axle 18
50 of the burner 19. The arm 38 has pivoted thereto the connecting rod 44 pivoted also at 45 with the crank arm 46 on the shaft 37. This shaft, through the crank arm 48 and link 49, has connection with a bell crank 50 which is operated by connection 51 from the warp machine (not shown) so that upon the starting of said warp machine the burner 19 will be automatically moved to singeing position with respect to the threads 24 constituting the work to be singed.
60 The valve 17, through the lever 52, has connection with the link 41 so that upon moving the burner 19 to the work the said valve 17 will be automatically opened through arm 52 for increasing the gas supply to said burner for the singeing operation.

Fixed to the hollow axle 18 of the burner 20 is a disk 53 having the peripheral detent notch 54 therein and eccentrically pivoted at 55 thereto a throw rod 56, the latter slidably fitted in a guide 57 carried by the frame 10. The rod 56 is formed with a ratchet notch 58 for a feed dog 59 swingingly mounted at 60 and movable by a link 61 pivoted thereto. This link 61 is pivoted to a crank arm 62 on the axle 18 of the burner 19.
75 Thus it will be seen that when the burner 19 is

swung to working position the link 61 will move the dog 59 which is engaged in the notch 58 of the rod 56 to turn the disk 53, whereby the burner 20 will be raised to working or singeing position. This disk 53 also has pivoted thereto
80 a link 63 which is pivoted to the arm 64 for operating the valve 17 in the vertical stretch 16 of the branch 15 of the supply pipe 14 leading to the burner 20 so that the flow of gas to the latter will be automatically controlled under the movement of said disk 53 and when the burner 20 swings to working position the valve will be opened to increase the supply to said burner.
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The shaft 37 has fixed thereto the crank arm 65 to which is pivoted a trip rod 66, the latter slidably through a guide 67 at the top of the frame 10. The frame at its top has pivoted at 68 thereto the detent 69 which is engageable by gravity in the notch 54 in the disk 53 when the latter is turned to bring the burner 20 in working position so that the detent 69 when engaged in the notch 54 will hold said burner 20 in its raised working position until the rod 66 which is in the path of said detent 69 releases the same from the notch 54, whereupon the burner 20 will recede to non-working or nonsingeing position as is shown in Figure 2 of the drawings.
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On the frame 10 and suitably projected therefrom is a stop 70 with which engages an abutment pin 71 on the disk 28 and connected with the hub 29 constituting the windlass is one end of a winding and unwinding strap 72 having a weight 73 at its free end, the strap 72 being automatically wound upon said windlass 29 and by the weight 73 thereon the pin 71 will be brought into abutting position with the stop 70 for the resetting of said disk 28 when the members 26 and 27 of the clutch are disengaged from each other for a purpose presently described.
105 110

The pin 71 when moved clockwise is adapted to engage with a projection 74 of a trip rod 75 slidable in a guide 76 and also the guide 67, the trip rod 75 being adapted to trip the detent 69 from engagement in the notch 54 in the disk 53 so as to permit the burner 20 to move to nonsingeing position when the same has been shifted to singeing position.
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Formed in the hub 29 is a cam 77 which operates upon a clutch release member 78 swingingly supported upon the shaft 37. The release member 78 is arranged in the path of a tripping wing 79 hinged upon a throw rod 80 pivoted to a crank arm 81 on the shaft 36 and slidable through a guide bracket 82 on the frame 10 of the machine. This wing 79 when not acted upon by the member 78 and moved by the arm 81 on the shaft 36 will operate upon the throw lever 33 to move the same for the bringing of the members 26 and 27 of the clutch into engagement with each other and when the member 78 operates upon the wing 79 the latter is swung out of engagement with the clutch lever 33 so that the members 26 and 27 of the clutch will be released from each other and said clutch opened.
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In the operation of the machine, assuming that the warp machine is started and the parts of the singeing machine are in the position as shown in Figure 2 of the drawings which is neutral position thereof, the instant the warp machine is started the bell crank 50 is shifted by the connection 51 and rod 41 is lifted so that the burner 19 will be thrown from its lowered position to an upper working position relative to the path of the threads 24 which travel from the right hand end of the frame 10 to the left hand
140 145 150

end thereof into the warp machine, it being understood of course that a sufficient amount of fuel is delivered to the burners 19 and 20 so that the same will be flamed and when the burner 19 is raised to working position the valve 52 is fully open so as to increase the flame of the burner 19 for the action thereof in singeing the thread 24. Simultaneously with the shifting of the burner 19 the feed dog 59 will be operated by the rod 61 to throw the feed arm 56 in a direction to turn the disk 53 and by so doing the burner 20 will be lifted from its lowered position in Figure 2 of the drawings to singeing position and likewise the gas flowing to said burner 20 will be increased for the full flaming thereof. In this working position of the burner 20 the detent 63 will engage the notch 54 in the disk 53, thereby holding said burner 20 in its working position. This burner 20 singes the threads 24 on the advance portion thereof between the warp machine and the burner 19, that is, for the length of the threads overlying the frame 10 of the machine between the locations of the burners 19 and 20 and immediately upon the singeing of this determined stretch of such threads 24 the burner 20 is automatically lowered to non-singeing or non-working position. This lowering of the burner 20 under the automatic action of the machine is controlled by the trip rod 75 operated upon by the pin 71 which under its clockwise travel engages with the projection 74 on the rod 75. Timed with the pin 71 is the cam 77 which controls the release member 78 for actuating the wing 79 to move the same out of engagement with the clutch throw lever 33 whereby the clutch will be opened by the disengagement of the members 26 and 27 thereof and thus the disk 28 will be freed while under the action of the strap 72 and weight 73 the said disk will be turned counter-clockwise, bringing the pin 71 thereon into engagement with the stop 70 and thus the trip rod 75 will be lowered to neutral position.

The dog 59 has formed therein a kicking time 83 which functions to lift the feed bar 56 out of engagement with the dog 59 when the disk 53 has moved to bring the burner 20 into working or singeing position with respect to the threads 24 so that when the detent 59 is tripped the disk 53 will be free to move for the lowering of the said burner 20 to non-working or non-singeing position.

The weighted balancing arms 22 for the burners 19 and 20 have fitted therewith shields 84 so that when the said burners 19 and 20 are in lowered non-singeing position as shown in Figure 2 of the drawings the shields 84 will overhang the same and eliminate the heat or flames of such burners reaching the threads 24 or the work. The axle 18 for the burner 19 operates lifters 85 and 86 respectively for the threads 24 to elevate the same when the burners 19 and 20 are in lowered non-singeing position, thereby holding such threads considerably away from such burners so as not to be affected by the flames issuing therefrom, it being understood of course that when these burners are in their lowered position the valves 17 will have been automatically partially closed so as to reduce the flames of such burners.

Should the warp machine become stalled for any reason and the burner 19 and also the burner 20 being in singeing position, the same will be automatically lowered under the action of the connection 51, bell crank 50, the rods 41 and 66 respectively so that the threads 24 will not become

burned or scorched as the burners 19 and 20 will become lowered or moved to non-singeing position.

It will be understood of course that in the working of the singeing machine the burner 19 is presented to the work, that is, the threads 24, and simultaneously therewith the burner 20 is presented to the work and this burner 20 is timed to recede from the work automatically after the stretch of the work lying between the warp machine and the burner 19 has become singed because the remainder of the work at the right hand side of the burner 19 will be singed thereby as the work is moved into the warp machine.

As has been previously indicated, should a thread 24 in the work fed over the singeing machine break during the singeing operation the burner 19 will be automatically lowered to non-singeing position and the shield 84 will lie directly between the lowered burner 19 and such threads while the latter will be elevated a determined height by the members 85 and 86 as hereinbefore described.

From the foregoing it is thought that the construction and manner of operation of the singeing machine will be clearly understood and therefore a more extended explanation has been omitted.

What is claimed is:

1. A machine of the character described comprising a stand, spaced movable burners arranged within the stand, means for delivering fuel to the burners, work delivery means, means for moving one burner into singeing relation to the work, means operated by movement of the last named burner to move the other burner into singeing relation to said work, and timed mechanism for releasing the last named burner for its movement to non-singeing position when the work has advanced the distance between both burners.

2. A machine of the character described comprising a stand, spaced movable burners arranged within the stand, means for delivering fuel to the burners, work delivery means, means for moving one burner into singeing relation to the work, means operated by movement of the last named burner to move the other burner into singeing relation to said work, timed mechanism for releasing the last named burner for its movement to non-singeing position when the work has advanced the distance between both burners, and means for regulating the fuel supply to the burners and automatically controlled by movement thereof.

3. A machine of the character described comprising a stand, spaced movable burners arranged within the stand, means for delivering fuel to the burners, work delivery means, means for moving one burner into singeing relation to the work, means operated by movement of the last named burner to move the other burner into singeing relation to said work, timed mechanism for releasing the last named burner for its movement to non-singeing position when the work has advanced the distance between both burners, means for regulating the fuel supply to the burners and automatically controlled by movement thereof, and shields related with the burners to lie between the same and the work when said burners are moved to non-singeing position.

4. A machine of the character described comprising a stand, spaced movable burners arranged within the stand, means for delivering fuel to the burners, work delivery means, means for moving one burner into singeing relation to

- the work, means operated by movement of the last named burner to move the other burner into singeing relation to said work, timed mechanism for releasing the last named burner for its movement to non-singeing position when the work has advanced the distance between both burners, means for regulating the fuel supply to the burners and automatically controlled by movement thereof, shields related with the burners to lie between the same and the work when said burners are moved to non-singeing position, and means for elevating the work and automatically operated by one of the burners when the latter is in non-singeing position.
5. A machine of the character described comprising a stand, spaced movable burners arranged within the stand, means for delivering fuel to the burners, work delivery means, means for moving one burner into singeing relation to the work, means operated by movement of the last named burner to move the other burner into singeing relation to said work, timed mechanism for releasing the last named burner for its movement to non-singeing position when the work has advanced the distance between both burners, means for regulating the fuel supply to the burners and automatically controlled by movement thereof, shields related with the burners to lie between the same and the work when said burners are moved to non-singeing position, means for elevating the work and automatically operated by one of the burners when the latter is in non-singeing position, and mechanism operatively connected with the burners to shift the same to non-singeing position should the work stall.
6. A machine of the character described comprising a stand, spaced movable burners arranged within the stand, means for delivering fuel to the burners, work delivery means, means for moving one burner into singeing relation to the work, means operated by movement of the last named burner to move the other burner into singeing relation to said work, timed mechanism for releasing the last named burner for its movement to non-singeing position when the work has advanced the distance between both burners, means for regulating the fuel supply to the burners and automatically controlled by movement thereof, shields related with the burners to lie between the same and the work when said burners are moved to non-singeing position, means for elevating the work and automatically operated by one of the burners when the latter is in non-singeing position mechanism operatively connected with the burners to shift the same to non-singeing position should the work stall, timed mechanism regulating the action of the burners, and power means for operating said mechanism.
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WILLIAM L. MYERS.

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