J. O. McKEAN.

GASSING MACHINE.

APPLICATION FILED SEPT. 17, 1909.

948,935.

Patented Feb. 8, 1910.

4 SHEETS—SHEET 1.

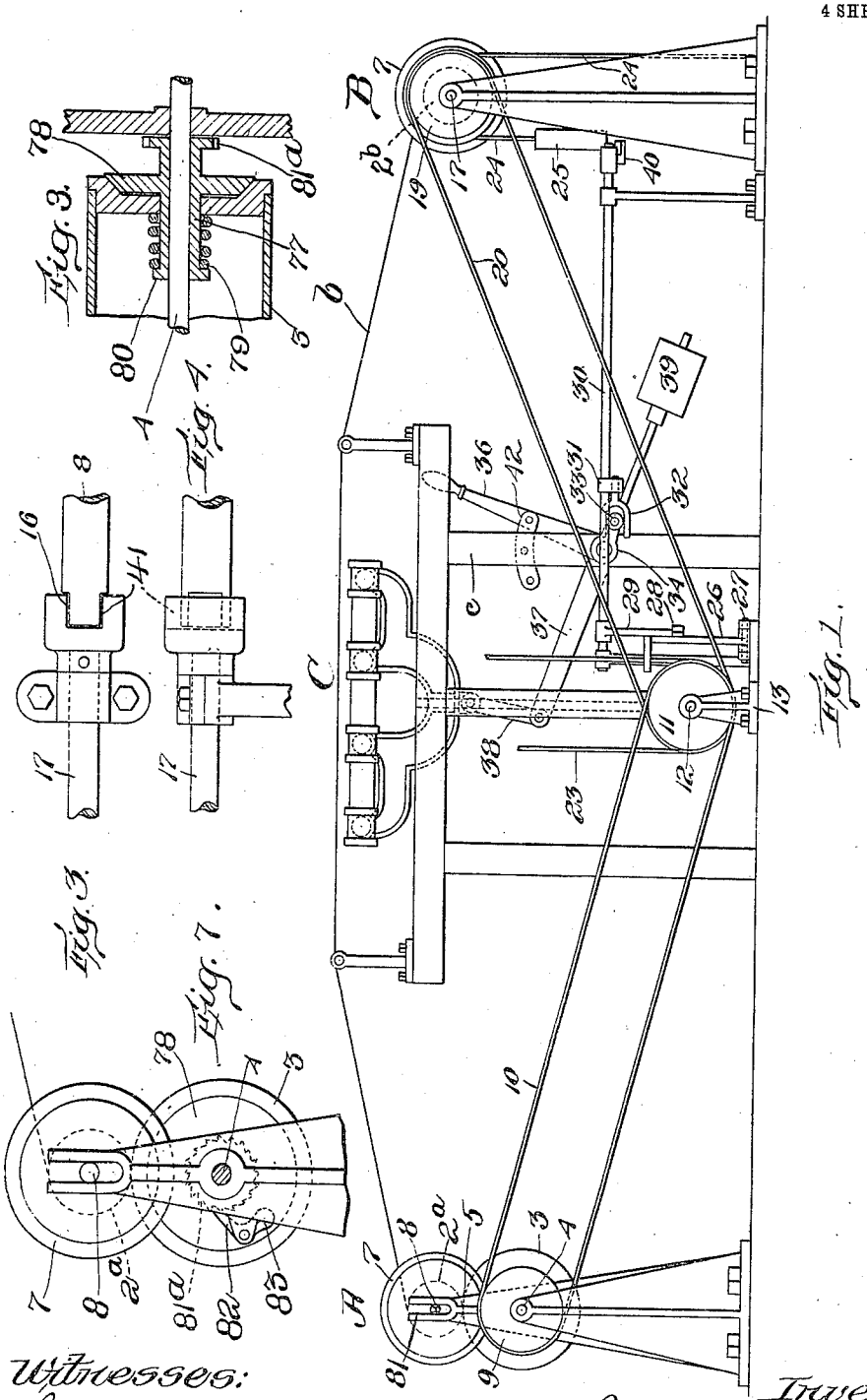

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 7.

Witnesses:

Joseph T. Brennan.

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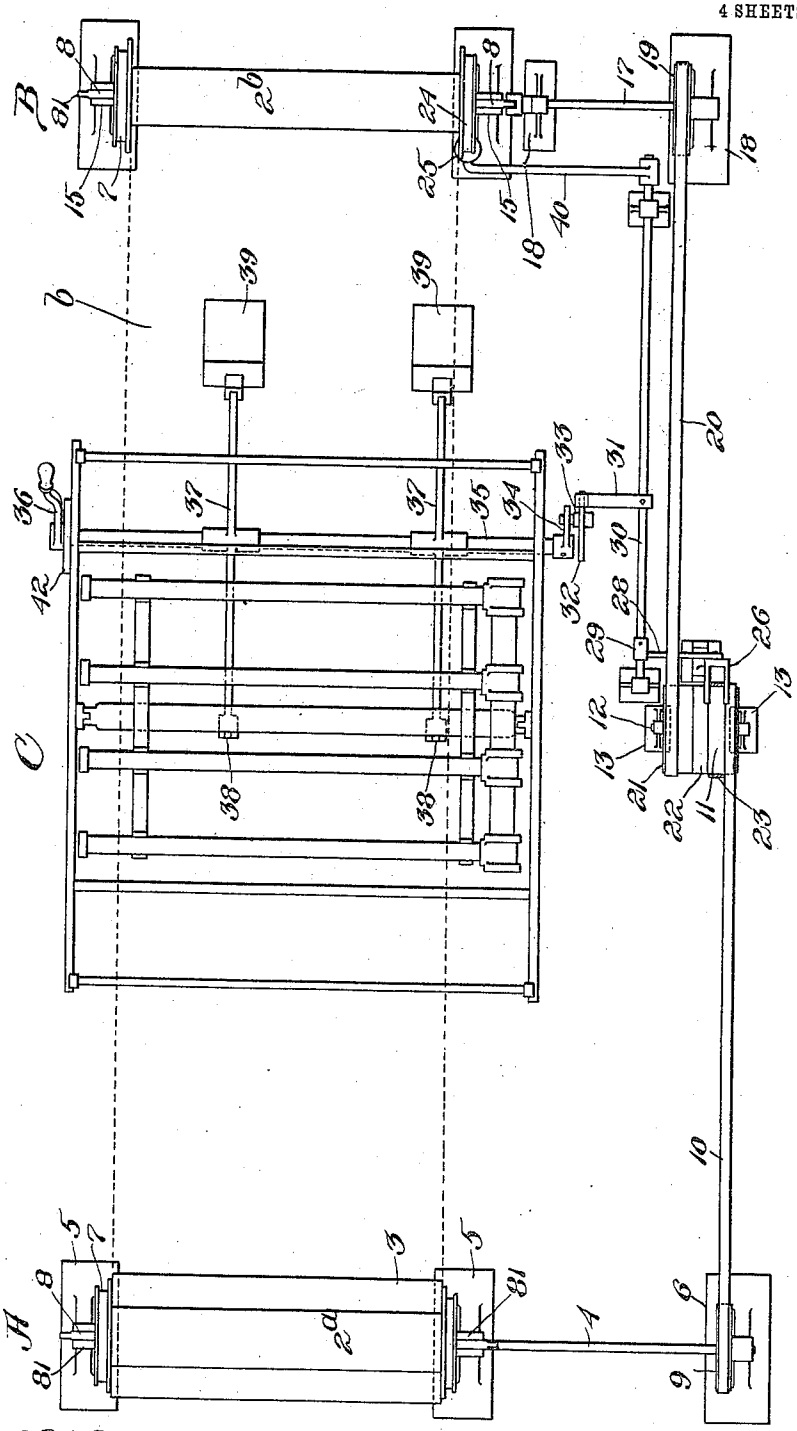

Fig. 2.

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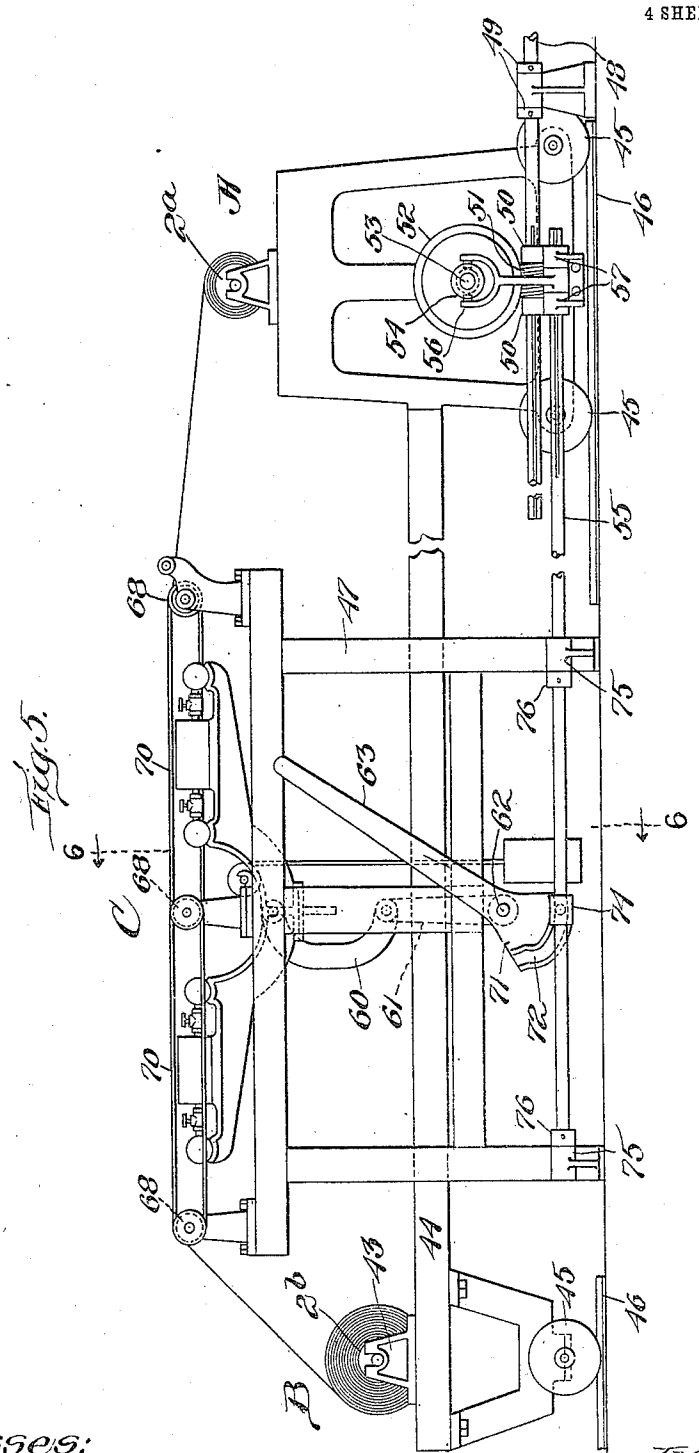

Fig. 5.

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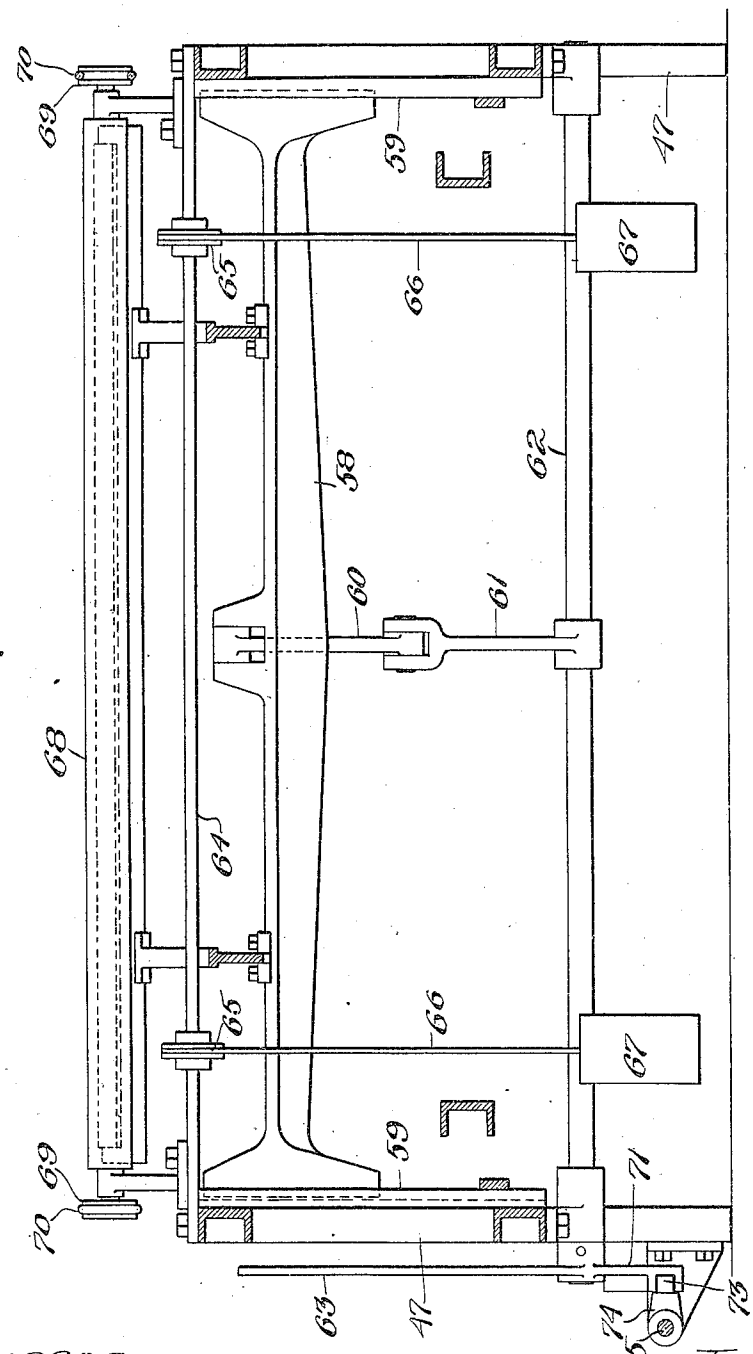

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN O. McKEAN, OF WESTFIELD, MASSACHUSETTS.

GASSING-MACHINE.

948,935. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed September 17, 1909. Serial No. 518,236.

To all whom it may concern:

Be it known that I, JOHN O. McKEAN, citizen of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Gassing-Machines, of which the following is a specification.

My invention relates to gassing machines such as are used for trimming threads by burning therefrom the loose projecting fibers.

The object of my invention is to improve the construction and mode of operation of machines of this class.

My improved gassing machine comprises a burner, a thread supply; means for drawing the thread from the supply past the burner so that the thread will be trimmed by the latter, and means for throwing the burner into and out of action. Any suitable means may be provided for throwing the burner into and out of action. As herein shown, the burner is supported with provision for movement toward and from the threads which extend from the thread supply to the thread drawing means, so that the burner can be shifted into and out of proximity to the thread or threads to render it operative or inoperative. Means are also provided for controlling the operation of the machine, so constructed that, in starting the machine, the thread drawing means is started before the burner is rendered operative; and in stopping the machine the burner is rendered inoperative before the thread drawing means is stopped. In this way the burner can act upon the threads only while the latter are in motion and cannot injure the thread as it would if permitted to act while the threads are at rest. It follows from the above described construction and mode of operation, that in stopping the machine a length of untrimmed thread will be carried past the burner while the machine is being stopped, and another length while the machine is starting. In order that the untrimmed lengths of thread may be subjected to the trimming action of the burner I provide means for shifting or adjusting the threads and burner relatively to each other, lengthwise of the threads, so that these untrimmed portions may pass the burner a second time and be trimmed after the machine is again started and the parts in operative proximity. This repassing may be accomplished by any means which advances the burner temporarily relative to the thread, in the direction in which the thread is being drawn, an amount equal to the untrimmed length. This is one feature of the invention, and particularly it is a feature to accomplish this by imparting a temporary reverse motion to the threads, sufficient to set the untrimmed length of thread back of the burner again so that when the machine is again started the untrimmed length will pass the burner a second time.

Other features of my invention are hereinafter pointed out.

In the accompanying drawings:—Figure 1 is a side elevation of a gassing machine embodying one form of my invention. Fig. 2 is a plan view of the machine shown in Fig. 1. Figs. 3 and 4 are details of the machine shown in Figs. 1 and 2. Fig. 5 is a side elevation of a gassing machine embodying another form of my invention. Fig. 6 is a section on line 6—6 of Fig. 5. Fig. 7 is a fragmentary side elevation of one of the winding rolls and its support. Fig. 8 is a sectional view of the driving drum and its support.

In the machine shown in Figs. 1 and 2 the thread drawing means, shown at A, comprises a thread winding roll 2^a which is surface driven by a drum 3 fast to a shaft 4, the latter journaled in uprights 5, 5 and 6. At its ends the roll 2^a is made with pulley flanges 7 and trunnions 8, the latter extending through guide slots 81 in the uprights 5. The trunnions 8 are flattened at their outer ends as shown clearly in Figs. 3 and 4 for the purpose described later.

The shaft 4 carries a fixed pulley 9 connected by a belt 10 with a pulley 11 loosely mounted on a shaft 12 that is journaled in bearings on uprights 13.

The thread supply, shown at B, comprises a roll 2^b which is preferably identical in construction with the roll 2^a of the thread drawing means. The trunnions 8 of the thread supply roll 2^b rest in open sockets provided on uprights 15, with the flattened end of one of said trunnions extending into a socket 16 provided upon the inner end of a shaft 17 journaled in bearings on uprights 18. The shaft 17 carries a fixed pulley 19 connected by a belt 20 with a pulley 21 loosely mounted on the shaft 12. The two pulleys 11 and 21 are arranged one at each side of a third pulley 22 loosely mounted on shaft 12, and a driving belt 23 is provided

which may be shifted onto any one of the three pulleys. When the belt 23 is in engagement with the pulley 11 power is transmitted to the driving drum 3 of the thread drawing means and the thread is drawn from the thread supply roll 2^b over the burner shown at C and wound upon the roll 2^a of the thread drawing means. Since the roll 2^a of the drawing means is surface driven by the drum 3 the rate of travel of the threads past the burner C is constant and therefore the threads are uniformly treated throughout their lengths, which would not be the case if the roll 2^a were axially driven.

In order to maintain a proper tension upon the threads a brake strap 24 is provided fastened at one end to one of the uprights 15, and extending upwardly over one of the pulley flanges 7 of the thread supply roll 2^b with a weight 25 fastened to its other end. During the normal operation of the machine the weight 25 hangs free and the engagement of the strap 24 with pulley flange 7 yieldingly retards the movement of the thread supply roll 2^b so as to produce the required tension on the threads.

When stopping the machine the burner C is first lowered into an inoperative position and then the driving belt 23 is shifted from the pulley 11 to the pulley 22 which runs idly with all of the other parts of the machine at rest. The lowering of the burner C before the belt 23 leaves the pulley 11 permits a portion of the thread to pass the burner C without being acted upon by the latter, and in order to set back this untrimmed portion before the machine is again started, the belt 23 is shifted from the pulley 22 to the pulley 21. Power is then transmitted through belt 20 and shaft 17 to the roll 2^b of the thread supply in a manner to reversely rotate said roll and rewind thereon as much of the thread that has been drawn off as is necessary to shift the untrimmed portion back into a position from which it will pass over the burner a second time after the burner is thrown into action and the machine is again started ahead. During this reverse movement of the thread supply roll 2^b the weight 25 is automatically lifted to free said roll of the brake strap 24 as described later.

Loosely mounted upon the shaft 4 and extending through one end of the drum 3 as shown in Figs. 7 and 8 is a sleeve 77 made with a clutch member 78 yieldingly pressed against the end of drum 3 by a spring 79 bearing at one end against a flange 80 on sleeve 77 and at its other end against the end of drum 3. Sleeve 77 also carries a ratchet 81^a coöperating with a pawl 82 held against said ratchet 81^a by a weight 83. The teeth of the ratchet 81^a are set so that when the machine is running ahead and the thread is being wound upon roll 2^a ratchet 81^a turns idly under pawl 82, but when the machine is reversed and drum 3 is reversely rotated through the drawing off of thread from roll 2^a, then pawl 82 engages ratchet 81^a and holds clutch 78 against rotation with drum 3 so that said clutch acts as a friction brake to yieldingly retard backward rotation of drum 3 and thereby maintain the threads under sufficient tension to prevent them sagging into the flame of burner 3, not only while the machine is at rest, but also while it is being run backward to set the thread back. When the threads *b* have been set back sufficiently belt 23 is shifted back to pulley 22 and weight 25 is automatically freed. To resume the normal operation of the machine the belt 23 is shifted from idler 22 onto pulley 11 and thereafter the burner C is brought into its upper operative position relatively to the threads.

The belt 23 is engaged by a forked shipper lever 26 pivoted at 27 to a suitable fixture and connected by a link 28 with an arm 29 fast on a rock shaft 30. The rock shaft 30 has fastened to it another arm 31 provided with a laterally extending fork or yoke 32 which embraces a stud 33 projecting from an arm 34. The arm 34 is fast to one end of a rock shaft 35 journaled in bearings on the frame *c* which supports burner C, and at its other end said shaft carries a hand lever 36. Fixed to the rock shaft 35 is a pair of levers 37 connected by links 38 with the burner C and carrying weights 39 which counterbalance the weight of burner C. To one end of the rock shaft 30 is fixed an arm 40 whose free end occupies a position immediately below the weight 25.

When the hand lever 36 occupies a vertical position the belt 23 is on the idler 22 and the machine is at rest with the burner C in its lowermost inoperative position. To start the machine the operator swings lever 36 to the right (Fig. 1) and the movement thus imparted to rock shaft 35 acts through arms 34 and 31, shaft 30, link 28, and shipper lever 26 to shift belt 23 from idler 22 onto pulley 11, and through levers 37 and links 38 to raise the burner C into its operative position. Since the belt 23 is brought into engagement with the pulley 11 at the very start of this movement of hand lever 36 and the levers 37 do not reach the limit of their upward movement until the end thereof, the thread drawing means A will be started in operation before the burner C is brought into operative position. To stop the machine the lever 36 is swung back to its vertical position again, and since the belt 23 does not leave the pulley 11 until near the end of this return movement of lever 36, the burner C will have been lowered into its inoperative position by levers 37 when belt 23 clears pulley 11.

In order to set back the untrimmed portion of the thread which passed the burner C while the machine was being stopped, the operator swings hand lever 36 from its intermediate vertical position to the left and the movement thus imparted to rock shaft 35 acts through arms 34 and 31, rock shaft 30, link 28 and shipper lever 26 to shift belt 23 from the idler 22 to pulley 21, while the arm 40 engages and lifts the weight 25 so as to release the thread supply roll 2^b from brake strap 24.

The rolls 2^a and 2^b of the drawing means and of the thread supply are made alike so that they will be interchangeable and it is for the same reason that the trunnion of the thread supply roll 2^b is detachably connected with the shaft 17 by the socket 16, the said socket being made, as shown in Figs. 3 and 4, with an open ended slot 41 with which the flattened end of the trunnion may be readily engaged or disengaged by bringing said slot into a vertical position. A segment 42 is provided for holding the hand lever 36 in its different positions.

In the form of my invention shown in Figs. 5 and 6 the roll 2^b of the thread supply B is supported in bearings 43 at one end of a carriage 44 provided with rollers 45 mounted to travel on tracks 46. The frame 44 extends under the burner C and at its opposite end carries thread drawing means A. The burner C is mounted upon a stationary support 47 between the thread supply and thread drawing means, and, as will be clear, the carriage 44 and parts carried thereby, may be shifted relatively to the burner C in a direction lengthwise of the threads to set back the untrimmed portion of the latter which passes the burner when the machine is stopped.

The thread drawing means A is driven by a shaft 48 journaled in bearings fixed to the floor. Collars 49 fixed to shaft 48 hold said shaft against endwise movement when the thread drawing means is shifted with carriage 44. The shaft 48 extends loosely through bearings 50 on carriage 44 and between these two bearings is a worm 51 splined to shaft 48 so as to be rotated thereby but with provision for movement with carriage 44. The worm 51 drives a gear 52 loosely mounted upon the main shaft 53 of the thread drawing means A, but said gear is adapted to be made fast to shaft 53 by a clutch 54 of ordinary construction. A rock shaft 55 carries a clutch operating lever 56 splined to said shaft between two bearings 57 on carriage 44 so that said lever is free to move along shaft 55 with carriage 44.

The burner C comprises a crosshead 58 mounted in vertical ways 59 on the burner support 47 and near its middle the crosshead is connected by a link 60 with an arm 61 fast on a rock shaft 62 journaled in bearings on support 47. To one end of shaft 62 is fastened a hand lever 63 by means of which said shaft is operated. Fixed at its ends to the support 47 above crosshead 58 is a transverse bar 64 on which is journaled a pair of pulleys 65, and over each pulley extends a belt or the like 66 connected at one end to a weight 67 and at its other end to the crosshead 58. These weights serve to practically counterbalance the weight of the crosshead and parts carried thereby.

Upon the top of support 47 are journaled three transverse thread supporting rolls or drums 68, one at each end of support 47 and one at the middle. The drums 68 carry pulleys 69 for belts 70 which connect the two end drums with the middle drum so that all of the drums rotate uniformly.

The hand lever 63 is made at its lower end with an extension 71 formed with a cam groove 72 into which extends a cam roll 73 provided at the outer end of an arm 74 fixed to shaft 55. The shaft 55 is journaled in bearings 75 on support 47 and is provided with collars 76 which hold it against endwise movement with carriage 44.

In the drawings the crosshead 58 is shown in its uppermost position with the burner in operative relation to the threads and with clutch 54 set and the threads traveling from the supply B to the thread drawing means A. When the operator desires to stop the machine he throws the hand lever 63 from the full line position to the left and at the start of this movement the arm 61 and link 60 shift the burner into its inoperative position and thereafter the cam 72 raises the arm 74 which acts through the shaft 55 and clutch lever 56 to unset clutch 54 and stop the thread drawing means A. In starting the machine the operator swings the hand lever 63 back to the position shown in the drawings and at the start of this movement the cam 72 acts to reset the clutch 54 and after the thread drawing means has been thus started the arm 61 and link 60 return the burner to operative position with relation to the threads.

It will now be clear that in both forms of my invention herein shown the burner C is in operative relation to the threads only while the threads are in motion, the thread drawing means being started before the burner is brought into operative position in starting the machine, and the burner being withdrawn from the threads before the operation of the thread drawing means ceases in stopping the machine. Also that in both forms of my invention the threads can be quickly set back in order to trim, by the action of the burner, lengths of thread which pass the latter in stopping the machine, in one form of my invention as shown herein, by rewinding for a short length, the threads upon the delivery roll and in the

other form by moving the delivery and drawing rolls and the threads extending between them, bodily, and thus carrying a length of the threads back of the burner.

In the form of my invention in which the two rolls and the threads extending between them are moved backward bodily, a reverse movement of the parts is gradually effected by hand after the machine is in operation in order to give the mechanism capacity for rearward motion after the machine has been again stopped.

What I claim is: —

1. A gassing apparatus comprising a burner and means to feed thread past it, combined with means to temporarily move the thread backward past the burner, whereby some of the thread passes the burner twice in the forward direction.

2. A gassing apparatus comprising a supply roll having thread wound thereon, a roll and driving means therefor adapted to draw thread from the supply roll; a burner between the supply and drawing rolls; and means to temporarily reverse the functions of said rolls, making the supply roll temporarily a drawing roll, whereby thread is drawn backward by it and will be again drawn forward past the burner when the normal operation is resumed.

3. A gassing machine comprising a thread supply; a burner; thread drawing means for drawing the thread from the supply past the burner; controlling means for starting the machine by first starting the operation of the thread drawing means and thereafter rendering the burner operative, and for stopping the machine by first rendering the burner inoperative and thereafter stopping the thread drawing means, and means to provide for moving the thread backward relatively to the burner so that when the machine is started the burner will trim the portion of the thread which passed said burner while the machine was being stopped.

4. A gassing machine comprising a thread supply; a burner; thread drawing means for drawing the thread from the supply past the burner; controlling means for starting the machine by first starting the operation of the thread drawing means and thereafter rendering the burner operative, and for stopping the machine by first rendering the burner inoperative and thereafter stopping the thread drawing means, and means for operating the thread supply while the burner is inoperative to shift the thread backward.

5. A gassing machine comprising a thread supply; a burner; thread drawing means; means for operating the thread drawing means to draw the thread from the supply past the burner; controlling means for starting the machine by first connecting the drawing means with its operating means and thereafter rendering the burner operative, and for stopping the machine by first rendering the burner inoperative and thereafter disconnecting the thread drawing means from its operating means, and means for operating the thread supply while the burner is inoperative to shift the thread backward so that when the machine is started the burner will trim the portion of the thread which passed said burner while the machine was being stopped.

6. A gassing apparatus comprising a thread supply; means to draw the thread from the supply; a burner between the supply and thread drawing means; means to separate and bring together the thread and burner and control the thread drawing means, and means to temporarily move the thread backward, whereby a portion of the thread is caused to repass the burner when the normal feed operation is resumed.

7. A gassing apparatus comprising a burner and means to feed thread past it, combined with means to separate the burner and thread from operative proximity and to return them thereto; means to stop and start the feed during said separation; and means to move the thread backward past the burner during said separation whereby some of the thread repasses the burner upon said subsequent returning of the thread and burner to operative proximity.

Signed by me at Boston, Massachusetts, this ninth day of September, 1909.

JOHN O. McKEAN.

Witnesses:
OLIVER MITCHELL,
JOSEPH T. BRENNAN.