

E. K. STANDISH.
BLOWER FOR BOILERS.
APPLICATION FILED OCT. 25, 1910.

1,006,019.

Patented Oct. 17, 1911.

5 SHEETS—SHEET 1.

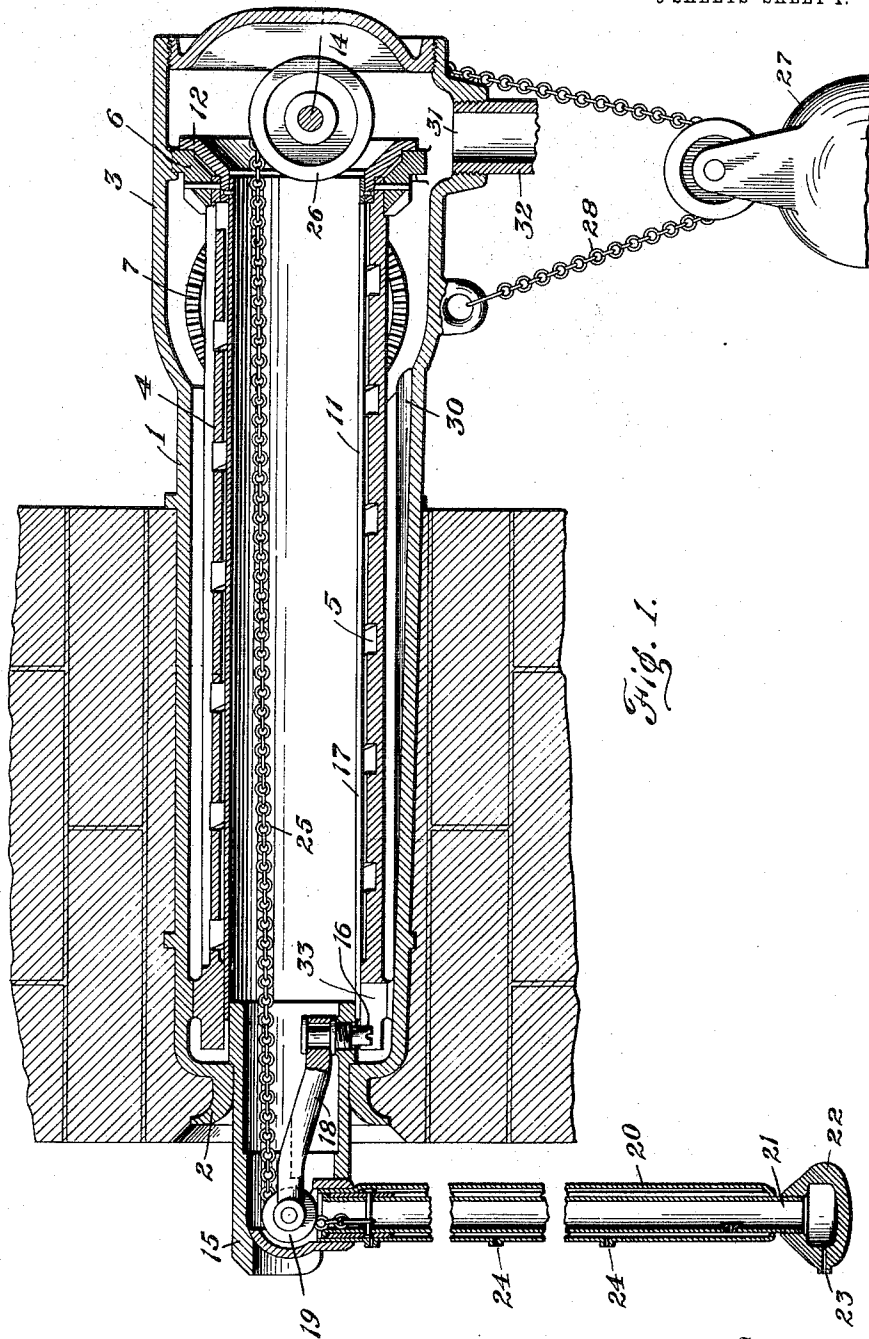


Fig. 1.

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Witnesses

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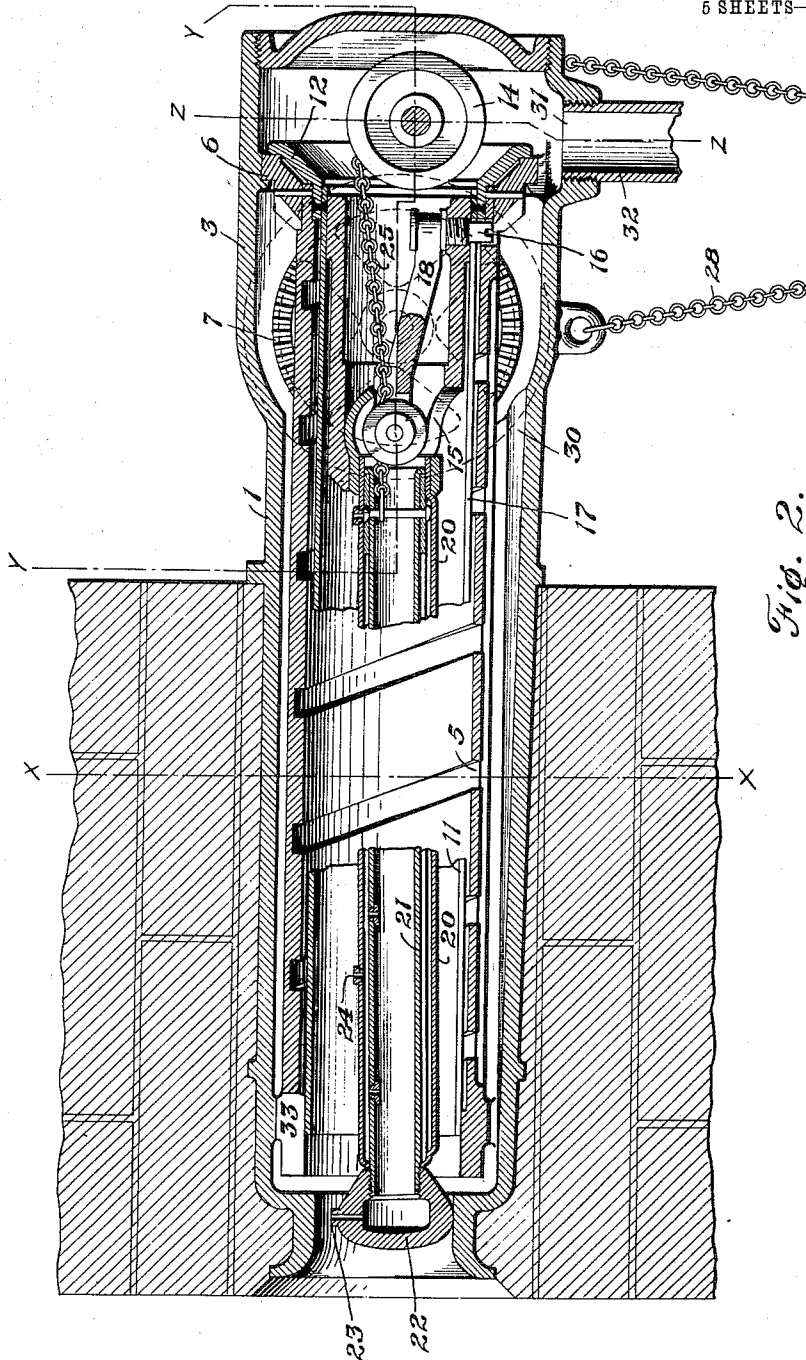


Fig. 2.

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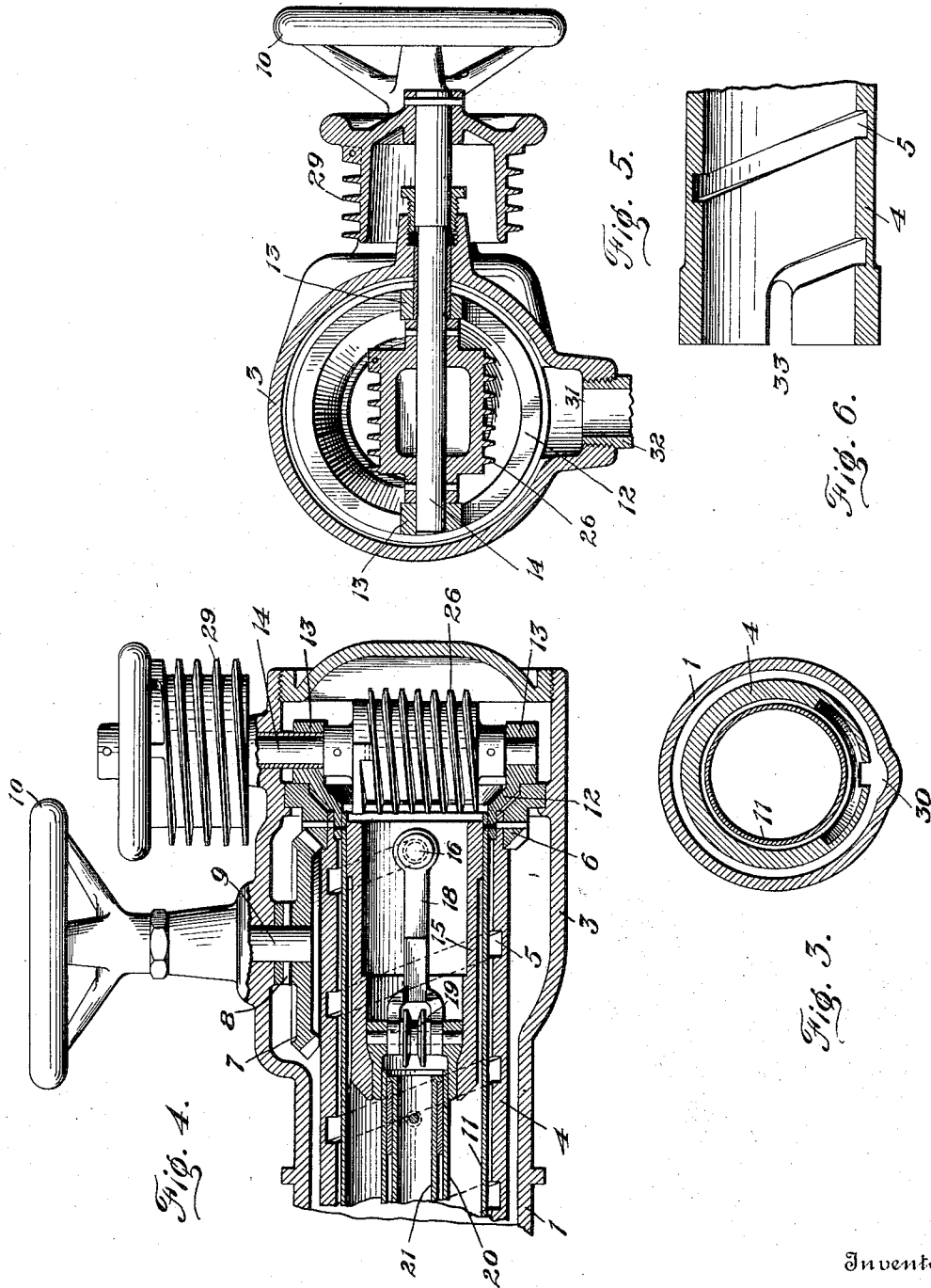
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

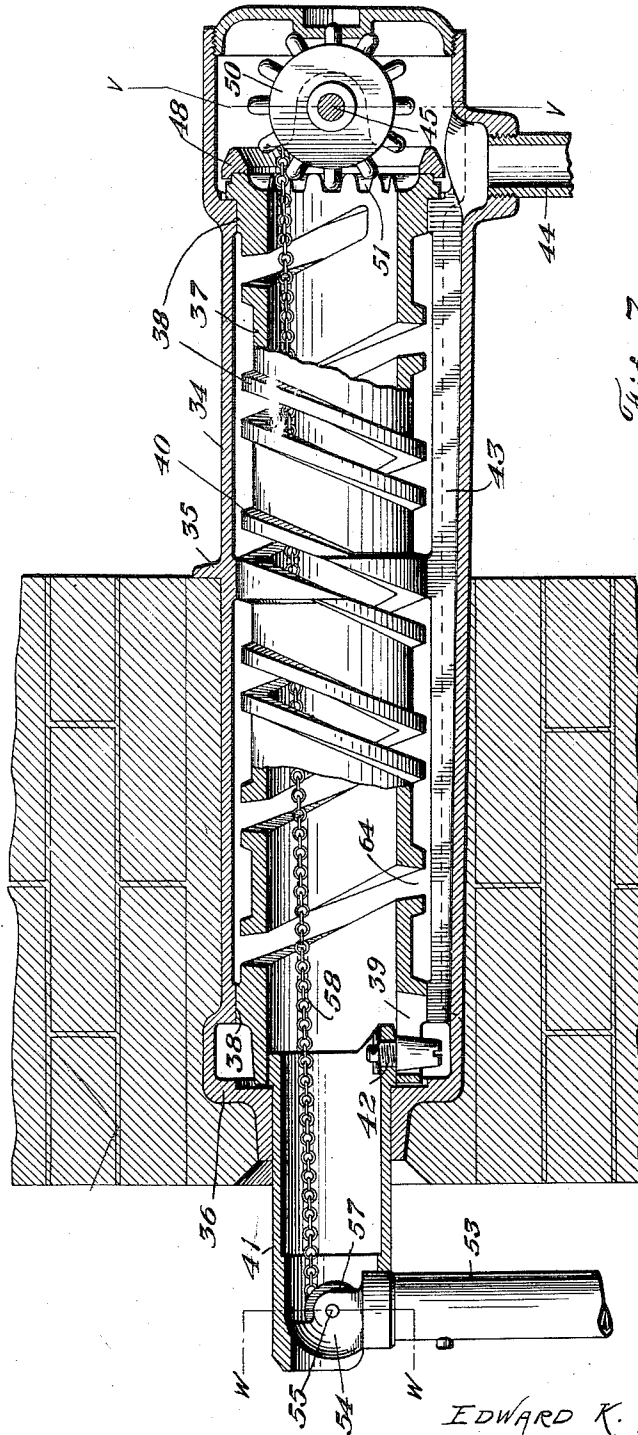


Fig. 7.

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5 SHEETS—SHEET 5.

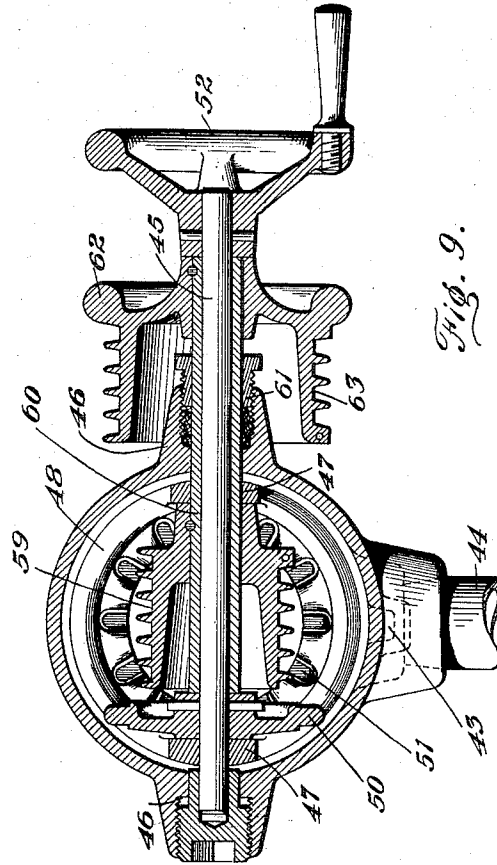


Fig. 9.

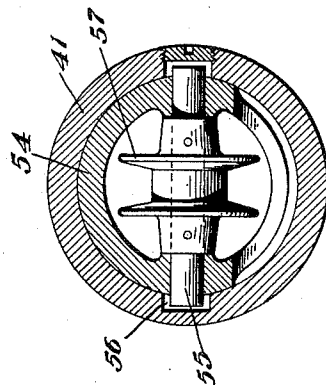


Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

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BLOWER FOR BOILERS.

1,006,019.

Specification of Letters Patent.

Patented Oct. 17, 1911.

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To all whom it may concern:

Be it known that I, EDWARD K. STANDISH, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Blowers for Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

In the operation of blowers for boilers it is necessary to provide for shielding the controlling parts from the heat of the boiler so that the operator can manipulate them without danger to himself, and it is also necessary that when not in use they present as little surface as possible in contact with the heat. It is also desirable that provision be made for the water of condensation and for rapid and easy manipulation of the parts.

This invention relates to a blower for boilers wherein a very small area of the blower as a whole is exposed to the fire or boiler heat when the device is not in use, and wherein the operator is perfectly shielded and can manipulate the device without discomfort.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view in longitudinal section partially broken away and partially retracted, of one form of blower that embodies features of the invention; Fig. 2 is a similar view showing the parts in fully retracted or in inoperative position; Fig. 3 is a view in section on line $x-x$ of Fig. 2; Fig. 4 is a view in section on line $y-y$ of Fig. 2; Fig. 5 is a view partly in section and partly in elevation on or about line $z-z$ of Fig. 2; Fig. 6 is a view in detail of the inner end of a worm barrel; Fig. 7 is a view in longitudinal section, partly broken away and partly in elevation, showing a preferred form of barrel; Fig. 8 is a view on or about line $w-w$ of Fig. 7; and Fig. 9 is a view partly in elevation and partly in transverse section taken through the barrel operating parts shown in Fig. 7.

As herein shown, in one form of apparatus an outer cylindrical casing 1 of suitable material has its inner flanged and flared end 2 which is slightly restricted, set in the wall of a boiler with an enlarged outer part 3

extended from the outer face of said wall. A tubular barrel 4 is journaled at each end to rotate in the casing and has an interior screw thread indicated at 5 of coarse pitch extending from end to end thereof. A longitudinal groove extends from end to end of the barrel on its outer face or it is otherwise weakened so that the thread groove cuts through the barrel wall for a portion of each turn. A beveled gear 6 on the outer end of the barrel meshes with a pinion 7 secured as by a pin 8 to the inner end of a spindle 9 extending through a suitable bearing lug on the side of the casing head 3 and carrying a hand wheel 10 for convenient manipulation.

A tubular lining 11 is concentrically disposed in the barrel 4 and is held in place by a flared annular head 12. Bearing lugs 13 on the latter afford support for a drum shaft 14 extending transversely through a suitable lug in the casing head 3. A sleeve 15 is longitudinally reciprocable in the lining 11 and is moved back and forth therein by a stud 16 passing through a longitudinal slot indicated at 17 in the lining 11 into engagement with the screw thread groove in the barrel 4. The stud 16 also acts as securing means for a bracket arm 18 on the outer end of which a pulley 19 is journaled. An extension 20 of the sleeve 15 has a hollow ball and socket connection or other suitable joint uniting it to the outer end of the sleeve 15 so as to swing at right angles thereto. A hollow arm 21 telescopes with the extension 20 and has an outer head 22 provided with steam jets 23 in line, preferably, with similar jets 24 on the extension 20. A chain 25 or like flexible connection is secured at its outer end to the inner end of the arm 21 and passes over the pulley 19 to a drum 26 on the drum shaft 14 within the casing head. If preferred a counterbalance weight 27 with suspending chain or cord 28 may be provided, the chain 28 running on to an outer balance drum 29 on the shaft 14.

The casing 3 has a longitudinal groove or drain duct indicated at 30 to permit the return of water of condensation toward the inlet mouth 31 of a nipple 32 to which a steam pipe may be connected.

At the inner end of the barrel 4 the groove of the screw thread has an extension indi-

cated at 33 parallel to the axis of the barrel into which the stud 14 moves when the parts are fully extended.

The above construction is suitable for use requiring great structural strength, but may be replaced by the construction shown in Figs. 7, 8 and 9 which in some respects is preferable. In the latter construction an outer casing 34 has a retaining flange 35 and an enlarged inner end 36 by which it is readily secured in the wall of a boiler. A barrel 37 has annular ribs 38 which form bearings by which it is rotatably mounted in the casing 34. An open helical cam path or screw thread 64 extends from end to end of the barrel with a slot 39 at its outer end substantially parallel to the barrel axis. Marginal flanges or beads 40 on either side of the thread reinforce the barrel to compensate for the portion cut away by the thread. A sleeve 41 may be reciprocated in the barrel if the latter be rotated, by means of a stud 42 engaging the cam path or screw groove and extending into a longitudinal inner groove indicated at 43 in the casing which acts not only as a guide to prevent rotation of the sleeve but also as a drain duct to carry the water of condensation toward an inlet nipple 44 at the outer end of the casing 34 which may be connected to a steam pipe. When the stud 42 reaches the extension slot 39 it clears the slot 43 and allows the sleeve to turn with the barrel. A transverse shaft 45 is journaled in diametrically opposite lugs 46 on the outer end of the casing and engages ears 47 secured to or formed on a collar 48 in the casing head that bears against the outer end of the barrel 37 as a thrust bearing therefor. A spur gear 50 on the shaft 45 within the casing head is adapted to mesh with teeth sockets 51 formed in the annular end face of the barrel 37 to rotate the latter when the shaft is turned as by a hand wheel 52 or the like. A tubular extension 53 is secured in the outer end of the sleeve 41 to swing at right angles as by an open ball and socket joint indicated at 54 working on a pivot pin 55 whose ends extend through the joint walls into slots or recesses indicated at 56 on the sleeve. A flanged pulley 57 on the pin 55 acts as a guide for a flexible connection 58, chain or the like, leading to a drum 59. The latter is keyed to a tubular member 60 rotatable on the shaft 45 and extends through a suitable stuffing box or gland 61. A hand wheel 62 is keyed or otherwise secured to the projecting end of the sleeve and may, if preferred, have a hub extension or drum 63 for taking up a chain or other flexible support to a counter balance weight. The tubular extension 53 is provided with the same telescoping arm and steam jets as in the prior construction. In operation manipulation of the hand wheel projects the sleeve toward

the boiler so that the extension pivoted thereto drops into a plane substantially parallel to the adjacent head of the boiler. By proper positioning of the steam jets in reference to the boiler flues, the operator may, by swinging the arm through proper manipulation of the hand wheel and shafts, direct jets of steam into the boiler flues. The parts are easily retracted and when in inoperative position the blower presents but a small surface to the action of the heat of the boiler. Ample provision is made for taking care of the water of condensation and the operator is not inconvenienced by heat and is not liable to injury from escaping steam as the casing is perfectly tight and prevents any steam escaping therefrom toward the operator.

Obviously, changes in the details of construction may be made without departing from the spirit of the invention and I do not care to limit myself to any particular form or arrangement of parts.

I claim as my invention:

1. A blower for boilers comprising a substantially cylindrical casing having a closed outer end provided with a steam inlet nipple and an open inner end, a barrel rotatable in the casing provided with a screw thread whose groove forms an opening through the shell of the barrel, a sleeve longitudinally reciprocable in the barrel provided with a laterally projecting member non-rotatably interlocking the sleeve and casing and engaging the screw thread of the barrel, a tubular extension articulated at its inner end to the adjacent end of the sleeve to swing into a plane transverse to the sleeve and provided with lateral steam jets, a hollow arm in telescopic engagement with the extension provided with a head having a steam jet, means for retracting the arm into the extension, and means for rotating the barrel.

2. A blower for boilers comprising a substantially cylindrical outer casing having a closed outer end provided with a steam inlet nipple and an open inner end portion adapted to be secured in a furnace wall, a barrel journaled in the casing and provided with an internal screw thread forming an opening through the shell of the barrel and having at its inner end an extension slot substantially parallel to the axis of the barrel, a sleeve longitudinally reciprocable in the barrel, a stud on the sleeve engaging the screw thread of the barrel and interlocking the sleeve and casing from relative rotation, a tubular extension articulated at one end to the end of the sleeve by a steam tight joint, permitting the extension to swing into a plane transverse to the sleeve, a hollow arm in telescopic engagement with the extension, a head on the outer end of the arm, lateral steam jet nozzles on the head and extension, a guide pulley journaled in the

sleeve near its point of connection with the extension, a flexible connection secured to the inner end of the arm and passing over the pulley, a drum rotatably secured in the outer end of the casing to which the flexible connection is secured, means for rotating the drum, and means for rotating the barrel.

3. A blower for boilers comprising an outer casing having a closed outer end provided with a steam inlet nipple and an open inner end portion adapted to be mounted in a furnace wall, a barrel rotatable in the casing, a sleeve longitudinally reciprocable in the barrel, means on the sleeve locking the latter against rotation in relation to the casing and co-acting with the barrel to reciprocate the sleeve when the barrel is rotated, means on the outer end of the casing for rotating the barrel, extensible members articulated to the outer end of the sleeve to swing in planes transverse thereto and provided with steam jets, and means for retracting said members.

4. A blower for boilers comprising a substantially cylindrical casing, having a closed outer end provided with a steam inlet nipple and an open inlet end portion adapted to be secured in a furnace wall, a barrel rotatable in the casing provided with an interior screw thread that forms an opening through the wall of the barrel, a sleeve reciprocable in the barrel, a lateral projecting member on the sleeve engaging the groove of the barrel screw thread and a longitudinal groove in the interior of the casing, the projecting member being adapted to clear the longitudinal groove when it reaches the inner end of the screw thread, hollow telescoping extension members articulated to the sleeve to swing into planes transverse thereto and provided with steam jet nozzles, means near the closed end of the casing for retracting the telescoping members, and means for rotating the barrel.

5. A blower for boilers comprising a casing having a closed outer end provided with a steam inlet nipple and with an interior longitudinal groove forming a drain duct to the nipple, a barrel journaled in the casing and provided with a screw thread forming an opening through the shell of the barrel, a sleeve reciprocable in the barrel, a laterally projecting member on the sleeve engaging the screw thread and the casing drain slot and clearing the latter when at one end of the barrel screw thread, hollow telescoping members articulated to one end of the sleeve to swing in planes transverse thereto and provided with steam jet nozzles, means for retracting the telescoping members, means for rotating the barrel and a manually operable member for driving the retracting and rotating means.

6. A blower for boilers comprising a substantially cylindrical casing having a closed

outer end provided with a steam inlet nipple, an interior longitudinal drain slot leading to the nipple and an open restricted inner end, a barrel journaled in the casing and provided with a screw thread whose groove forms an opening through the barrel shell and has a slot extension at the inner end of the barrel parallel to the barrel axis, a sleeve longitudinally reciprocable in the barrel, a stud extending from the sleeve engaging the screw thread and drain slot and clearing the latter when lying in the extension slot of the screw thread, a tubular extension pivotally connected by a steam tight joint to one end of the sleeve to swing in planes transverse thereto and provided with steam jet nozzles, a hollow arm in telescopic engagement with the extension, a head on the outer end of the arm having a steam jet nozzle, a guide pulley in the sleeve near the extension joint, a shaft extending transversely through the outer end of the casing, a drum on the shaft, a flexible connection passing from the arm over the pulley to the drum, a gear on the shaft adapted to engage and rotate the barrel and a hand wheel for operating the shaft.

7. A blower for boilers comprising a substantially cylindrical casing having a closed outer end provided with a steam inlet nipple, an interior longitudinal drain slot leading to the nipple and an open inner end portion adapted to be secured in a furnace wall, a barrel rotatable in the casing provided with a screw thread forming an opening through the shell of the barrel and having an extension slot at its inner end parallel to the axis of the barrel, a sleeve longitudinally reciprocable in the barrel, a stud extending from the sleeve through the barrel screw thread into the casing drain slot and clearing the latter when in the extension slot of the thread, an open ball and socket joint at the inner end of the sleeve, a pin passing through the walls of the socket into recesses in the walls of the sleeve, a tubular extension secured by the socket to the sleeve and provided with steam jet nozzles, a hollow arm in telescopic engagement with the extension provided with a head having a steam jet nozzle, a guide pulley journaled on the socket joint pin, a flexible retracting member passing from the arm over the pulley, means at the outer end of the casing for taking up the retracting member, and means at the outer end of the casing for rotating the barrel.

8. A blower for boilers comprising a substantially cylindrical casing having a closed outer end provided with a steam inlet nipple, an interior longitudinal drain slot leading to the nipple and an open inner end portion adapted to be secured in a furnace wall, a barrel rotatable in the casing provided with a screw thread forming an open-

ing through the shell of the barrel and having an extension slot at its inner end parallel to the axis of the barrel, a sleeve longitudinally reciprocable in the barrel, a stud
 5 extending from the sleeve through the barrel screw thread into the casing drain slot and clearing the latter when in the extension slot of the thread, an open ball and socket joint at the inner end of the sleeve,
 10 a pin passing through the walls of the socket into recesses in the walls of the sleeve, a tubular extension secured by the socket to the sleeve and provided with steam jet nozzles, a hollow arm in telescopic engagement
 15 with the extension provided with a head having a steam jet nozzle, a guide pulley journaled on the socket joint pin, a flexible retracting member passing from the arm over the pulley, a shaft journaled transversely
 20 in the outer end of the casing, a tubular spindle journaled on the shaft, a drum secured on the shaft within the casing to which the retracting member is secured, a hand wheel outside the casing secured
 25 to the tubular spindle, means on the shaft within the casing for rotating the barrel, and means for turning the shaft.

9. A blower for boilers comprising a substantially cylindrical casing having a closed
 30 outer end provided with a steam inlet nipple, an interior longitudinal drain slot leading to the nipple and an open inner end portion adapted to be secured in the furnace wall, a barrel rotatable in the casing provided
 35 with a screw thread forming an opening through the shell of the barrel and having an extension slot at its inner end parallel to the axis of the barrel, a sleeve longitudinally reciprocable in the barrel, a stud
 40 extending from the sleeve through the barrel screw thread into the casing drain slot and clearing the latter when in the extension slot of the thread, an open ball and socket joint at the inner end of the sleeve,
 45 a pin passing through the walls of the socket into recesses in the walls of the sleeve, a tubular extension secured by the socket to the sleeve and provided with steam jet nozzles, a hollow arm in telescopic engagement
 50 with the extension provided with a head having a steam jet nozzle, a guide pulley journaled on the socket joint pin, a flexible retracting member passing from the arm over the pulley, a shaft journaled transversely
 55 in the outer end of the casing, a tubular spindle journaled on the shaft, a drum secured on the spindle within the casing to which the retracting member is secured, a hand wheel outside the casing
 60 secured to the tubular spindle, a drum on the hand wheel, a counter weight, a flexible support for the counter weight connected to the hand wheel drum, means within the casing on the shaft for rotating the barrel, and
 65 means for rotating the shaft.

10. A blower for boilers comprising a substantially cylindrical casing having a closed outer end provided with a steam inlet nipple, a longitudinal drain slot and an open inner
 70 end portion adapted to be secured in a furnace wall, a barrel journaled in the casing and provided with a screw thread whose groove forms an opening through the shell of the barrel and terminates at its inner end
 75 in an extension slot parallel to the barrel axis, an annular thrust bearing member against the outer end of the barrel, a shaft journaled transversely in the outer end of the casing, ears on the thrust member
 80 through which the shaft passes, a gear secured to the shaft within the casing engaging sockets in the barrel end to rotate the latter, means for rotating the shaft, a sleeve longitudinally reciprocable in the barrel provided
 85 with a laterally projecting member engaging the barrel screw thread and the casing drain slot and clearing the latter when in the screw thread extension slot, telescoping tubular members articulated to the sleeve
 90 to swing in planes transverse thereto and provided with steam jet nozzles, retracting means connected to the telescoping members, and means mounted on the transverse shaft for operating the retracting means.

11. In a blower for boilers a substantially
 95 cylindrical casing having a closed outer end with steam inlet nipple and a longitudinal drain slot, a barrel within the casing, peripheral ribs on the barrel rotatable in the casing, a barrel having an open screw thread
 100 extending from end to end thereon and terminating at the inner end of the barrel in an extension slot parallel to the barrel axis, reinforcing flanges on the periphery of the barrel at the margins of the screw thread
 105 groove, and means mounted on the outer end of the casing for rotating the barrel.

12. In a blower for boilers a substantially
 110 cylindrical casing having a closed outer end with steam inlet nipple and a longitudinal drain slot, a barrel within the casing, peripheral ribs on the barrel rotatable in the casing, the barrel having an open screw thread
 115 extending from end to end thereof and terminating at the inner end of the barrel in an extension slot parallel to the barrel axis, reinforcing flanges on the periphery of the barrel at the margins of the screw thread
 120 groove, a sleeve longitudinally reciprocable in the barrel, a stud extending from the sleeve through the screw thread into the casing drain slot and clearing the latter when in the extension slot of the thread, extensible
 125 members pivoted to the sleeve and provided with steam jet nozzles, and means on the outer end of the casing for retracting the extensible members and for rotating the barrel.

13. A blower for boilers comprising a substantially cylindrical casing having a closed
 130 outer end with steam inlet and a longitudinal

drain slot, a barrel in the casing, peripheral
 ribs on the barrel rotatable in the casing, a
 barrel having an open screw thread running
 from end to end thereof, and terminating at
 5 the inner end of the barrel in an extension
 slot parallel to the barrel axis, reinforcing
 flanges at the margins of the screw thread
 groove, an annular thrust bearing member
 in the casing in contact with the outer end of
 10 the barrel, diametrically opposite external
 lugs on the casing, a shaft rotatable in the
 lugs, ears on the annular thrust member
 through which the shaft passes, a gear on
 the shaft within the casing meshing with a
 15 series of sockets in the barrel end, a barrel
 spindle rotatable on the shaft extending
 through a packing gland in one of the bosses,
 a drum secured on said spindle within the
 casing, a hand wheel secured on the spindle
 20 outside the casing, a drum on the hand
 wheel, a counter balance weight, a flexible
 support for the counter balance weight se-
 cured to the hand wheel drum, a hand wheel
 for rotating the shaft, a sleeve reciprocable

in the barrel, a stud on the sleeve extend- 25
 ing through the barrel screw thread into the
 casing drain slot and clearing the latter when
 in the extension slot of the screw thread, an
 open ball and socket member in the inner
 end of the sleeve, a pin extending through 30
 the walls of the socket member into recesses
 in the sleeve wall, a guide pulley on the pin
 a tubular extension secured on the socket
 joint member to swing in planes transverse
 to the sleeve, steam jet nozzles on the ex- 35
 tension, a tubular arm telescoping with the
 extension, a head on the arm end, a steam
 jet nozzle on the head, and a flexible retract-
 ing member passing from the inner end of
 the arm over the guide pulley to the inner 40
 drum on the tubular spindle.

In testimony whereof I affix my signature
 in presence of two witnesses.

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Witnesses:

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