(No Model.)

C. K. McGEHEE.

BOILER FEEDER.

No. 342,528. Patented May 25, 1886.

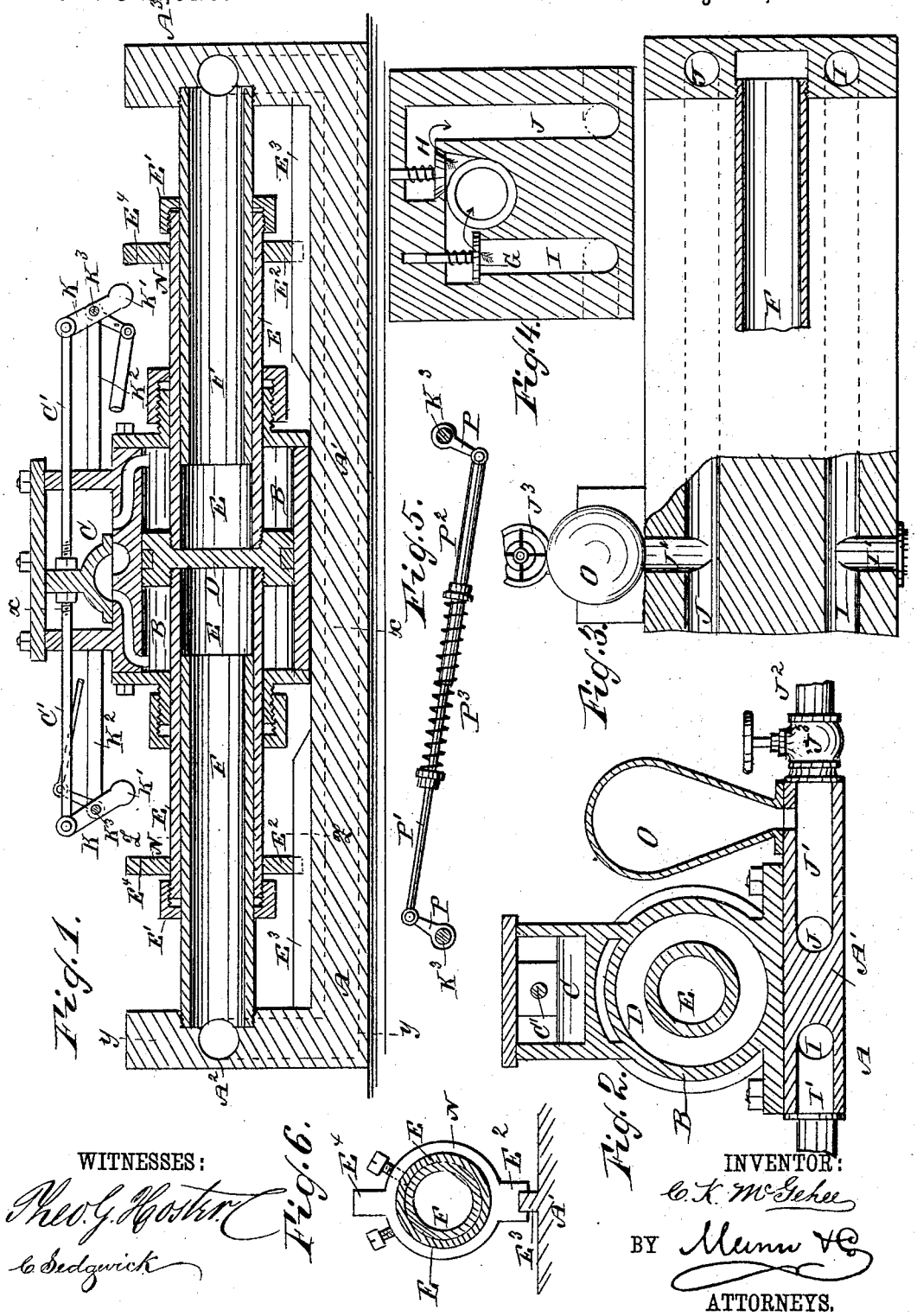

Fig. 1.

Fig. 3.

Fig. 2.

Fig. 4.

Fig. 5.

Fig. 6.

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BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 342,528, dated May 25, 1886.

Application filed August 26, 1885. Serial No. 175,376. (No model.)

To all whom it may concern:

Be it known that I, CLAUDIOUS KENNER McGEHEE, of Liberty, in the county of Amite and State of Mississippi, have invented a new and Improved Boiler-Feeder, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved boiler-feeder which is simple in construction, automatic in its operation, and which heats the feed-water.

The invention consists of a steam-cylinder, slide-valve, piston, and hollow plungers attached to the piston and sliding over cylinders connected with inlet-valves and outlet-valves secured in the frame of the apparatus.

The invention also consists of various parts and details hereinafter more fully set forth and and described.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal vertical section of my improvement. Fig. 2 is a vertical cross-section of the same on the line *x x* of Fig. 1. Fig. 3 is a plan view, partly in section, of the frame. Fig. 4 is a vertical cross-section of the frame on the line *y y* of Fig. 1. Fig. 5 is a detail view of the valve-rod connection; and Fig. 6 is a transverse section on the line *z z*, Fig. 1.

The machine is mounted on a frame, A, consisting of the base-plate, A′, and the vertical end plates, A^2 A^3. The steam-cylinder B is secured in the middle of the base-plate A′, and is provided with the usual slide-valve, C, and ports and the piston D. The latter is provided centrally on each side with a hollow plunger, E, which projects beyond the cylinder B, and is provided on its outer end with a cap, E′. Near each cap E′ is placed the ring N on the plunger E, which is adjustable on the same by means of set-screws, and provided with the downwardly-projecting forked lug E^2, which slides on a raised guide, E^3, secured to base-plate A′. Into each of these hollow plungers E projects a cylinder, F, secured with its outer end in the end plates, A^2 A^3, respectively, and which outer end is in communication with the inlet-valve G and the outlet-valve H, placed in suitable recesses in the end plates, A^2 A^3.

The frame A is provided with a channel, I, passing through the bed-plate A′ and up the end plates, A^2 A^3, and which connects the two inlet-valves G G in the end plates, A^2 A^3, and into which channels leads the inlet-pipe I′. The outlet-valves H H are similarly connected by means of the channel J, which also passes through the bed-plate A′ and up the end plates, A^2 A^3, and is provided with the discharge-opening J′, over which is placed the air-chamber O. The discharge-pipe J^2 is provided with a check-valve, J^3.

The slide-valve C is provided with the valve-rods C′, secured in opposite directions to the valve C, and each rod C′ is connected with the lever K, secured to a shaft, K^3, mounted on standards K^2. The lower end, K′, of the lever K is moved by a projection, E^4, on the ring N, so that the slide-valve C opens and closes the ports of the steam-cylinder B automatically. The shafts K^3 are each provided with a crank-arm, P, which are connected with each other by means of the rods P′ and P^2, which telescope each other, and are provided with the push-spring P^3. The purpose of this spring P^3 is to quicken the motion of the valve C in the direction it is moving when the cranks P pass the center line, so that the end spring will finish moving the valve. The parts are so arranged that the projection E^4 will alternately push the levers K until the cranks pass the center line before the valve closes the ports, and the spring P^3 will quickly move the valve in the direction in which it is moving.

The inlet-channels I and the outlet-channels J may be provided with stop-cocks. (Not shown in the drawings.)

The operation is as follows: Steam acting against the piston D causes the same to move forward and backward in the cylinder B, and thereby imparts a sliding motion to the plungers E, which slide over the stationary cylinders F. By this motion of the piston D the water is drawn into the cylinders F and E through the inlet-valves G and channel I alternately, and discharged from the cylinders F and E on the return-stroke of the piston D, through the outlet-valve H and channels J, into the boiler by means of the outlet J′. It will be seen that on account of this machine being double-acting a constant flow of feed-water is produced. The frame A, being in close contact with the steam-cylinder B, becomes heated, and consequently heats the feed-water passing

through the channels I and J. The feed-water also comes in contact with the heated cylinders F and E, cylinder B acting as a steam-jacket to the same. The movement of the rings N regulates the motion of the slide-valve C by means of the valve-rods C′ and the levers K.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a boiler-feeder, the base-plate A′, having end plates, A^2 A^3, channels I J in the base-plate and end plates, the inlet and outlet valves, G H, and the cylinders F F, secured at their outer ends in the end plates, and communicating with the channels between their inlet and outlet valves, in combination with the steam-cylinder B, connected with the adjacent ends of the cylinders F F, the piston D, and the cylindrical plungers E E, sliding on the cylinders F F, substantially as set forth.

2. In a boiler-feeder, the steam-cylinder B, the piston D, the hollow plunger E, the ring N, provided with the lug E^2, and the guide E^3, in combination with the cylinder F, the inlet-valve G, and the outlet-valve H, substantially as shown and described.

3. The combination, with the steam-cylinder B, the slide-valve C, and operating-rods C′ C′, secured to shafts K^3, of the cranks P, secured to opposite sides of said shafts, the telescopic rods $P' P^2$, connecting said shafts, and the spring P^3, forcing the rods apart, substantially as set forth.

4. The combination, with the steam-cylinder, the piston, and the piston rods or plungers having projections, of the slide-valve C, the levers K, mounted on shafts K^3, with their ends K′ in the path of the projections on the piston rods or plungers, the rods C′ C′, connecting the slide-valve and the upper ends of levers K, the cranks P, projecting above and below the shafts K^3, the telescopic rods connecting said cranks, and the spring P^3, forcing said rods apart lengthwise, substantially as set forth.

5. The combination, with the steam-cylinder, the piston and the plungers projecting from opposite sides thereof, and the projections on the upper sides thereof, of the slide-valve C′, the shafts K^3, the levers K, secured thereon between their ends, rods C′ C′, connecting the slide-valve and the upper ends of the levers, the lower ends of the levers being in the path of the projections on the piston-rods, and means for quickening the movement of the valve C in the direction in which it is being moved by the said levers K, substantially as set forth.

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