

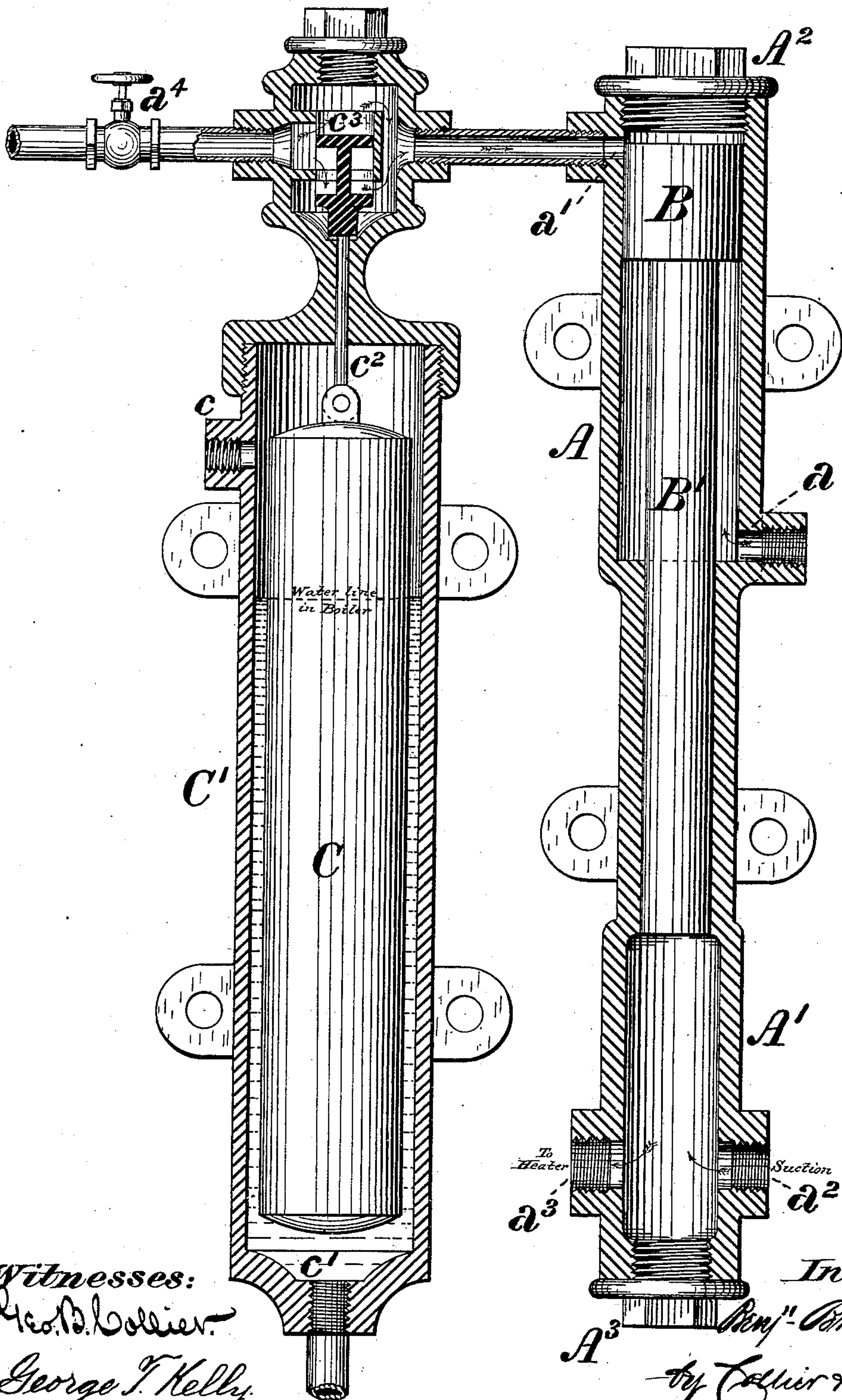
(No Model.)

B. BRAZELLE.

BOILER FEEDER.

No. 245,778.


Patented Aug. 16, 1881.



Witnesses:

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UNITED STATES PATENT OFFICE.

BENJAMIN BRAZELLE, OF ST. LOUIS, MISSOURI.

BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 245,778, dated August 16, 1881.

Application filed May 7, 1881. (No model.)

To all whom it may concern :

Be it known that I, BENJAMIN BRAZELLE, of St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Boiler-Feeders, of which improvements the following is a specification.

The object of my invention is to provide a boiler-feeder of simple and inexpensive construction, having the capacity of either continuous or intermittent operation during the working of a steam-engine, without the employment of any members deriving motion from moving parts of the engine, and having the further capacity of regulation, either automatically or by hand, in accordance with the requirements of supply.

To this end my improvements consist in the combination of a steam-cylinder having at each of its ends a port adapted to communicate with one end of the cylinder of an ordinary steam-engine, a piston working in said steam-cylinder, and a piston-rod secured to said piston and forming the plunger of a pump-barrel in line with said steam-cylinder.

My improvements further consist in the combination, with a direct-acting steam-pump operated by steam supplied from the cylinder of a steam-engine, of a float connected to a regulating-valve located in one of the steam supply pipes of the pump.

The improvements claimed are hereinafter more fully set forth.

The accompanying drawing is a vertical central section through a boiler-feeder embodying my improvements.

The cylinder A of my improved boiler-feeder is of small diameter relatively to that of the steam-engine in connection with which it is to be employed, and is bored out truly to receive a piston, B. Two ports, a a' , are formed in the cylinder A, one adjacent to each of its ends, each port passing through a nozzle, which is tapped or flanged to admit of its connection with a steam-supply pipe, said supply-pipes communicating, respectively, with the opposite ends of a steam-engine cylinder. A piston-rod, B', is secured to or formed in a piece with the piston B, and, passing through an opening in one end of the cylinder, to which opening it is neatly fitted, enters and serves as a

plunger for a pump-barrel, A', in line with the cylinder A, and, by preference, cast in a piece therewith. The cylinder and pump-barrel are closed by removable bonnets A^2 A^3 ; and ports a^2 a^3 , fitted to communicate, respectively, with a suction and a delivery valve, are formed in the pump-barrel.

In operation the piston B and plunger B' will be continuously reciprocated during the movement of the steam-engine from which the cylinder A receives steam, a stroke in each direction being made coincidently with the corresponding stroke of the engine-piston by a portion of the steam which effects said last-named stroke, such steam being thereafter returned to the engine-cylinder through the pipe by which it was supplied, and exhausted from the engine-cylinder in the ordinary manner. The difference of area between the upper and lower surfaces of the piston B causes the downward or forcing stroke to be made, as is desirable, under a correspondingly greater exertion of pressure than that which effects the upward or drawing stroke. The length of stroke of the piston and plunger, and consequently the quantity of water delivered at each stroke, may be reduced, as desired, by reducing the quantity of steam admitted to the cylinder by means of a valve, a^4 , located at any convenient position in one of the supply-pipes leading to the ports of the cylinder A.

In cases where automatic regulation is desired, the same may be attained by the employment of a float, C, in a water-vessel, C', the level of the water in which is maintained at a height corresponding with that of the water in the boiler by pipes connecting the steam and water spaces of the boiler with the upper and lower ports, c c' , of the water-vessel C' respectively. The float C is pivoted at top to the lower end of a rod, c^2 , passing through the cover of the water-vessel, and connected at its opposite end to a balanced valve, c^3 , fitting a corresponding seat in the supply-pipe leading to the port a' of the cylinder. The rising and falling of the float, accompanying variations in the water-level in the boiler, will effect corresponding movements in the valve c^3 , by which the supply of steam to the cylinder A will be regulated in accordance with the requirements of water-supply to the boiler.

My improvements embody the advantages of reducing the duty of the moving members of the main engine, and, by the material simplification of mechanism involved in the suppression of all moving parts save a piston and plunger, produce an effective and reliable pumping apparatus suited either to continuous or to intermittent action. I further attain the advantage of economizing steam, for the reason that the steam-supply of the pump, being taken from that of the cylinder and returned to and exhausted therewith, is automatically regulated by the movements of the piston of the main engine-cylinder, and the quantity of steam employed to actuate the pump is at all times restricted to that which is required to furnish a supply of water to the boiler directly proportionate to the work performed under varying conditions by the engine.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, with a steam-engine, of a steam-pump having each end of its steam-

cylinder connected by a pipe with one end of the steam-engine cylinder, substantially as set forth. 25

2. In a boiler-feeder, the combination, substantially as set forth, of a steam pumping-cylinder having a port at each of its ends adapted to communicate with one end of a steam-engine cylinder, a piston working in said pumping-cylinder, and a piston-rod secured to said piston and forming the plunger of a pump-barrel in line with said pumping-cylinder. 30 35

3. The combination, with a steam pumping-cylinder receiving steam at its ends by supply-pipes from the ends of a steam-engine cylinder, of a regulating-valve located in one of the supply-pipes, and a float adapted to rise and fall in a containing-vessel in correspondence with variations of the water-level in a steam-boiler, substantially as set forth. 40

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