

(No Model.)

C. P. KOLM.
GAS REGULATOR.

No. 420,726.

Patented Feb. 4, 1890.

Fig. 1.

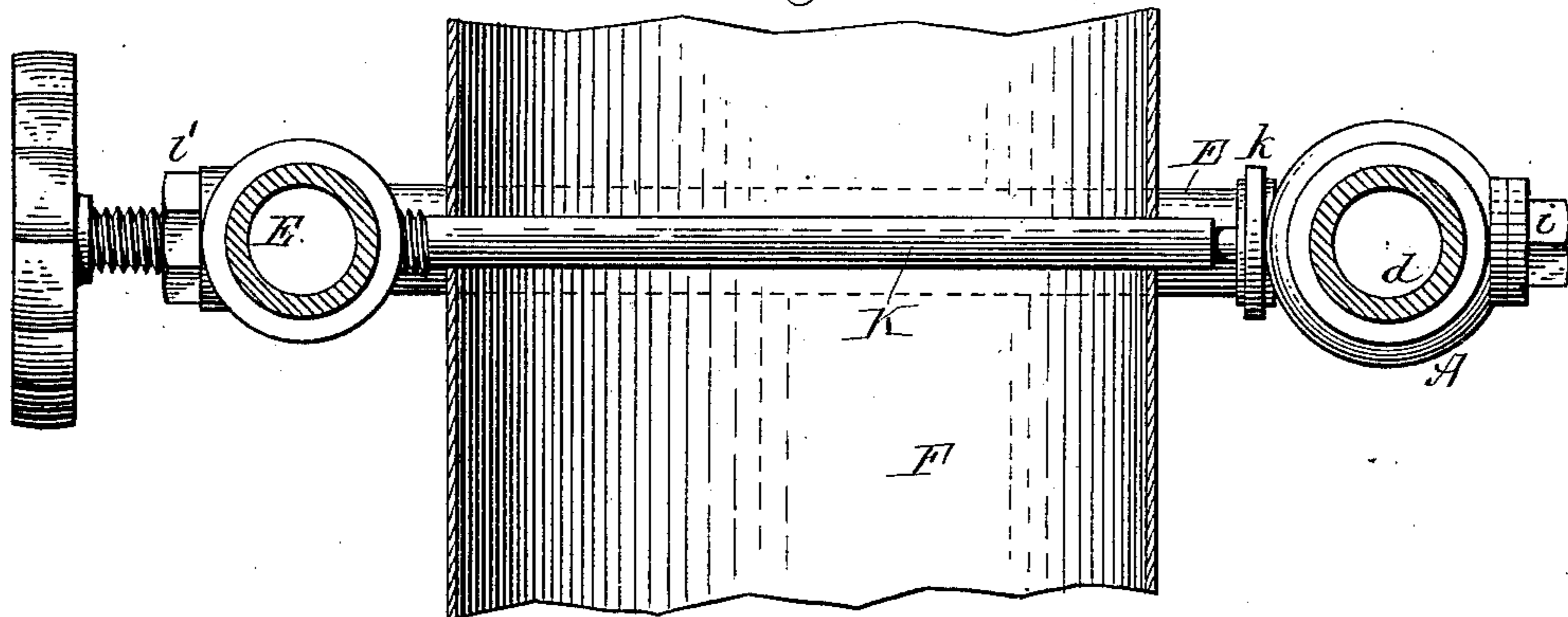


Fig. 2.

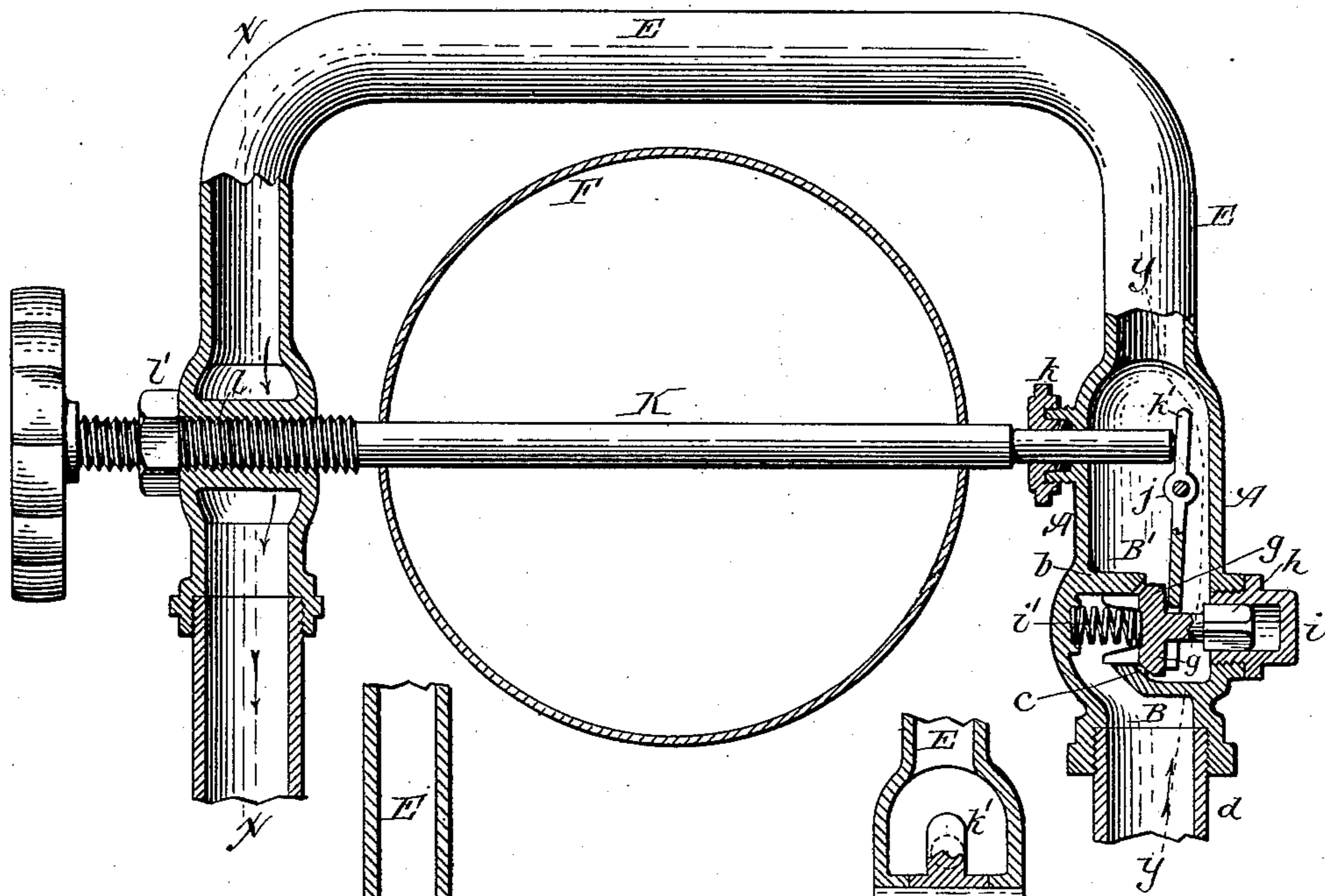


Fig. 3.

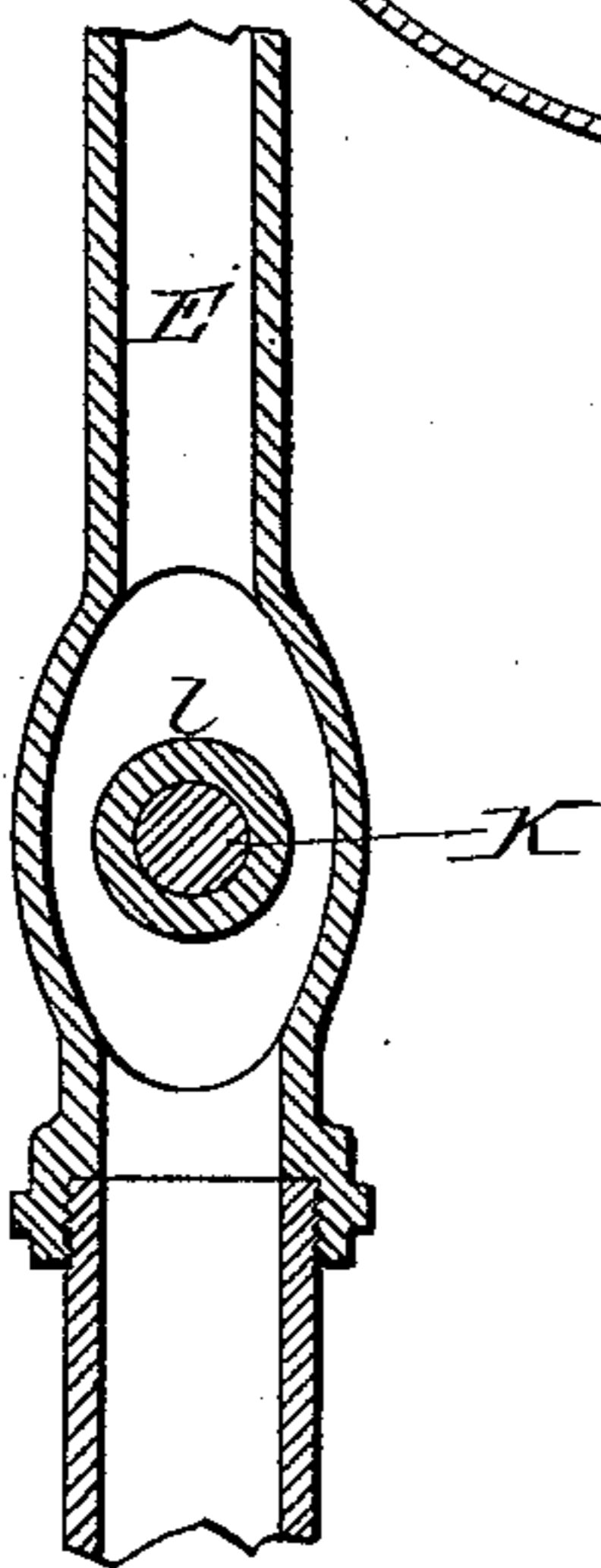
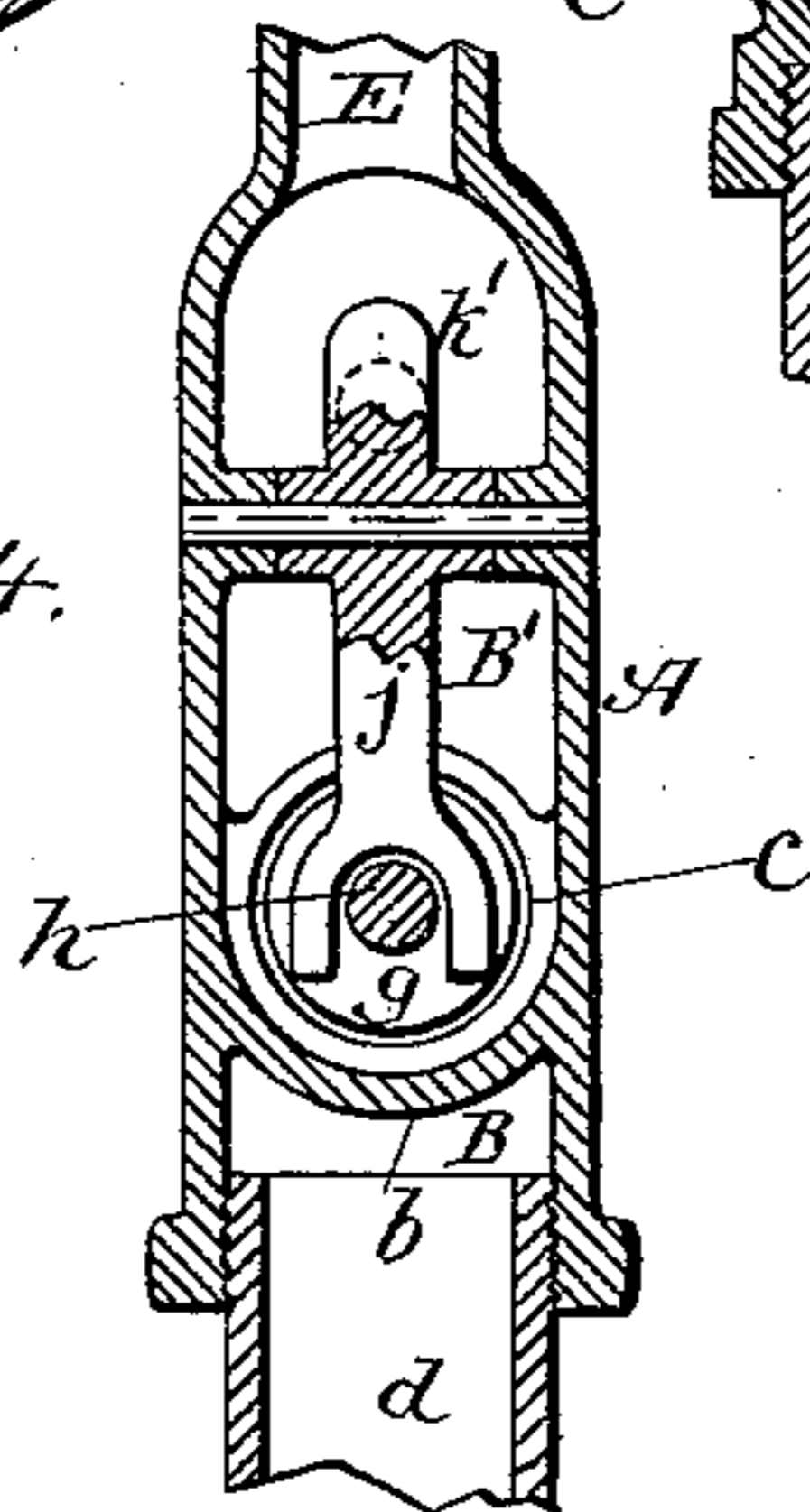


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHRISTIAN P. KOLM, OF KNAPP'S CREEK, NEW YORK, ASSIGNOR TO JACOB L. MCKENZIE, OF SAME PLACE.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 420,726, dated February 4, 1890.

Application filed May 23, 1889. Serial No. 311,856. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN P. KOLM, a citizen of the United States, residing at Knapp's Creek, in the county of Cattaraugus and State of New York, have invented new and useful Improvements in Gas-Regulators, of which the following is a specification.

This invention relates to a pressure-regulator for controlling the passage of gas through a supply-pipe, and more particularly to a regulator which is especially desirable for regulating the supply of natural gas to ranges and other stoves.

The object of my invention is to construct a simple and sensitive regulator of this class which is readily attached to a stove.

The invention consists of the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of my improved regulator applied to a stove-pipe. Fig. 2 is a horizontal section thereof, partly in elevation. Fig. 3 is a longitudinal section of the discharge end of the regulator in line *x x*, Fig. 2. Fig. 4 is a longitudinal section of the casing of the regulating-valve in line *y y*, Fig. 2.

Like letters of reference refer to like parts in the several figures.

A represents the casing of the regulator proper, which is divided into an inlet-chamber B and an outlet-chamber B' by a partition *b*, having an opening or passage *c*, whereby the two chambers are placed in communication with each other, as represented in Fig. 2.

d represents the inlet-pipe of the regulator, connected with the source of supply and having the usual shut-off cock, (which is not shown in the drawings,) and E is the discharge-pipe connecting the regulator with the burner in the stove, and extending preferably around the stove-pipe F, so as to form with the regulator proper a U-shaped frame, as shown in Fig. 2.

g represents a regulating-valve located in the outlet-chamber B' and controlling the passage of the gas through the opening *c*. This valve is preferably conical or beveled, and the opening *c* is provided with a correspondingly-beveled valve-seat, as shown.

h is the stem of the valve, which is guided in a socket or cap *i*, arranged in the outer side of the casing A.

i' is a spiral spring arranged in the inlet-chamber B and interposed between the face of the regulating-valve *g* and the adjacent inner wall of the chamber B. The spring *i'* tends to press the regulating-valve away from its seat and open the passage *c*.

j represents a shifting-lever pivoted within the casing A and bearing with its outer long arm against the rear side of the regulating-valve *g*. The outer end of this lever is preferably bifurcated and straddles the stem of the regulating-valve, as shown in Figs. 2 and 4. The lever *j* swings in a plane parallel with the direction in which the valve *g* moves, so that upon swinging the lever in the proper direction it will move the valve toward its seat against the pressure of the spring *i'*.

K represents an expansible actuating-rod passing transversely through the interior of the stove-pipe F, so as to be exposed to the heat therein. The inner end of this rod enters the side of the inner chamber B' through a stuffing-box *k* and bears against the inner arm *k'* of the shifting-lever *j*, as represented in Fig. 2. The outer portion of the rod is screw-threaded and secured in a threaded opening formed in a boss *l*, arranged in the end portion of the discharge-pipe E of the regulator. The expansible rod is held against lengthwise movement in the boss *l*, and is clamped therein by a jam-nut *l'*, applied to the projecting outer portion of the rod and bearing against the adjacent portion of the pipe E.

The expansible rod K is constructed of copper or other metal possessing the expansible property in a high degree, so that it will readily expand or contract as the temperature in the stove-pipe rises or falls. The rod, being secured at its outer end and free to move at its inner end, will elongate toward the lever *j* when the temperature increases, and thereby swing the lever *j* on its pivot and cause it to move the regulating-valve *g* toward its seat, decreasing the size of the passage *c* and reducing the supply of gas to the pipe E. As the rod again contracts by a fall in the temperature it moves away from

the lever and allows the spring *i'* to again open the valve farther till the contraction of the rod ceases and the movement of the lever is arrested. When a normal amount of gas is consumed, the heat in the stove-pipe F is normal, and the expansion of the rod K is just sufficient to leave the valve open to the required extent to allow of a normal supply of gas to the burner. When the supply is excessive, the temperature rises above the normal point and the actuating-rod expands, thereby causing the regulating-valve *g* to move toward its seat and diminishing the supply of gas to the burner. As the temperature again falls the rod contracts and allows the spring *i'* to open the valve to a greater extent, thereby again increasing the supply. The gas-supply is thus regulated and kept uniform by the expansion and contraction of the rod K, the supply being reduced when the temperature rises above the normal and increased when it falls below the normal.

The device is regulated to the approximate normal supply desired by adjusting the inner end of the expansible rod K with reference to the inner end of the shifting-lever *j*, so as to properly limit the range of movement of the valve to open the valve to the required extent. This adjustment is accomplished by loosening the jam-nut *l'* and turning the rod and then again tightening the jam-nut. The expansible rod is provided with a hand-wheel or other means for turning it.

My improved regulator is readily applied to a stove-pipe at comparatively small expense, and requires no separate supporting-frame, it being only necessary to form openings in opposite sides of the stove-pipe for the passage of the expansible rod.

I am aware that the dampers of stoves and the ventilating-valves of incubators have been automatically regulated by means of thermostatic rods. I am also aware that the valves or cocks of water-pipes have been au-

tomatically operated by means of a thermostatic rod, so as to prevent freezing of the water in the pipes when the temperature falls to a point at which the water is liable to freeze. I do not therefore desire to claim such devices.

I claim as my invention—

1. The combination, with a stove pipe or flue, of a gas-supply pipe, a regulator-casing arranged in said supply-pipe and provided with a gas-passage, a regulating-valve arranged in the casing and controlling its gas-passage, and an expansible rod arranged in the stove-pipe projecting into said regulator-casing and operating said regulating-valve, substantially as set forth.

2. The combination, with a stove pipe or flue, of a gas-supply pipe, a regulator-casing arranged in said supply-pipe and provided with a gas-passage, a regulating-valve arranged in the casing and controlling the gas-passage thereof, a shifting-lever pivoted in the casing and operating said valve, and an expansible rod arranged in the stove-pipe projecting into the regulator-casing and operating upon said shifting-lever, substantially as set forth.

3. The combination, with a stove pipe or flue and a gas-supply pipe extending around the stove-pipe, of a regulator-casing arranged in the supply-pipe and having a gas-passage, a regulating-valve controlling said passage, and an expansible rod passing through the stove-pipe and adjustably secured at its outer end to the gas-supply pipe and projecting with its inner end into the regulator-casing and operating the regulating-valve, substantially as set forth.

Witness my hand this 13th day of May, 1889.

CHRISTIAN P. KOLM.

Witnesses:

M. M. DYE,

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