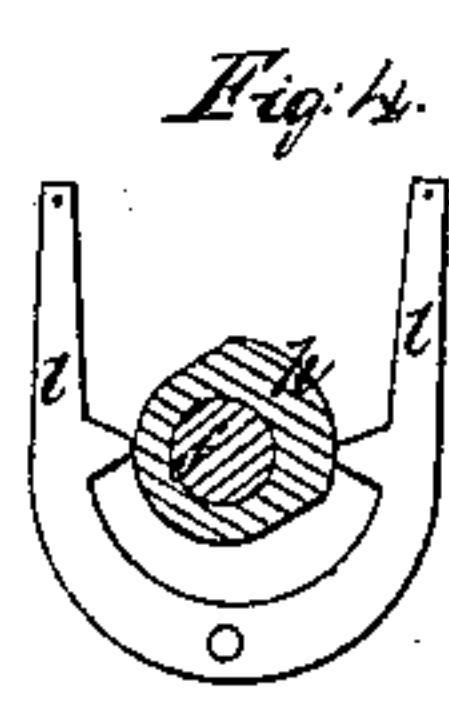
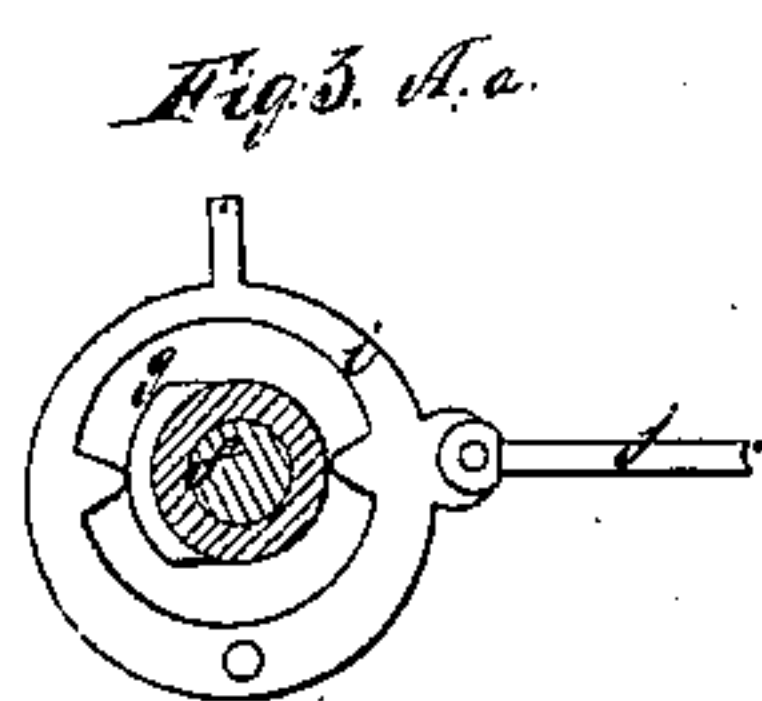
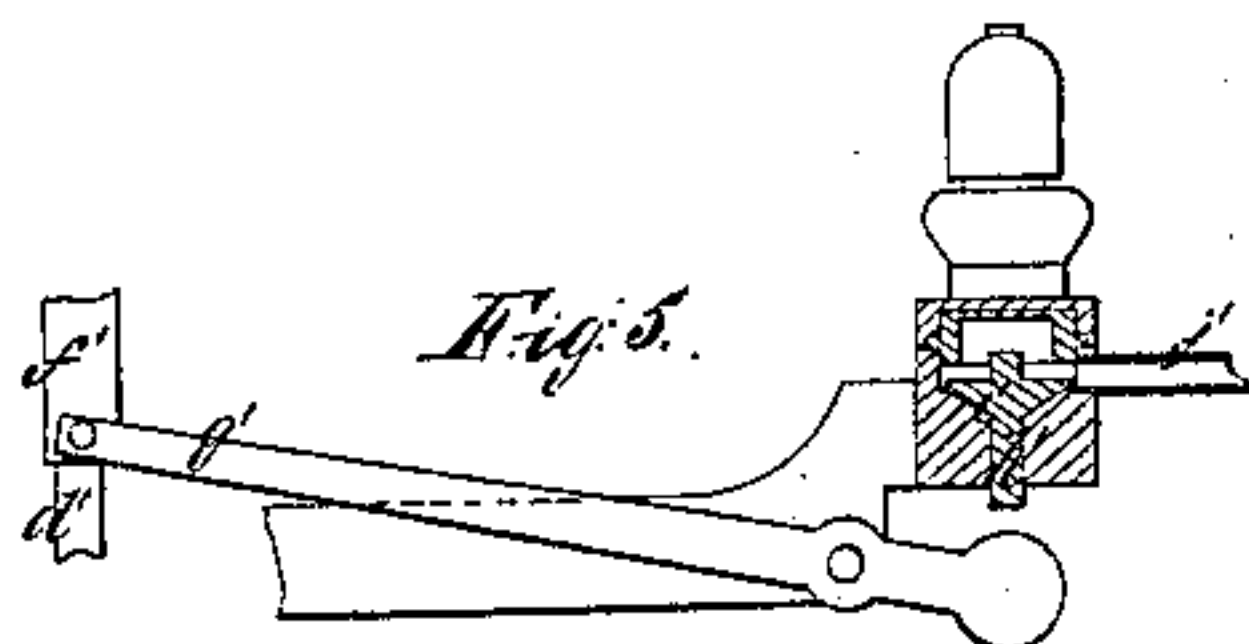
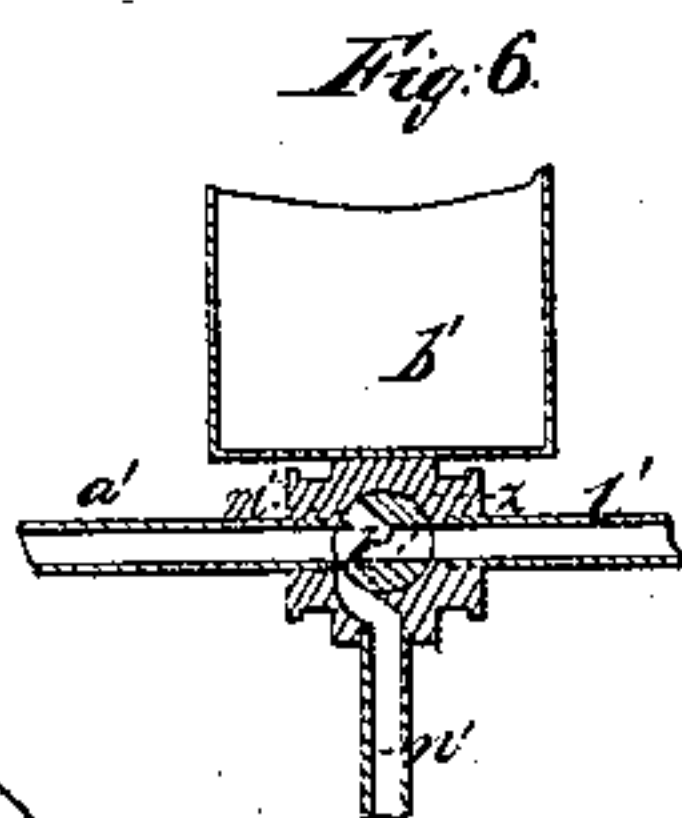
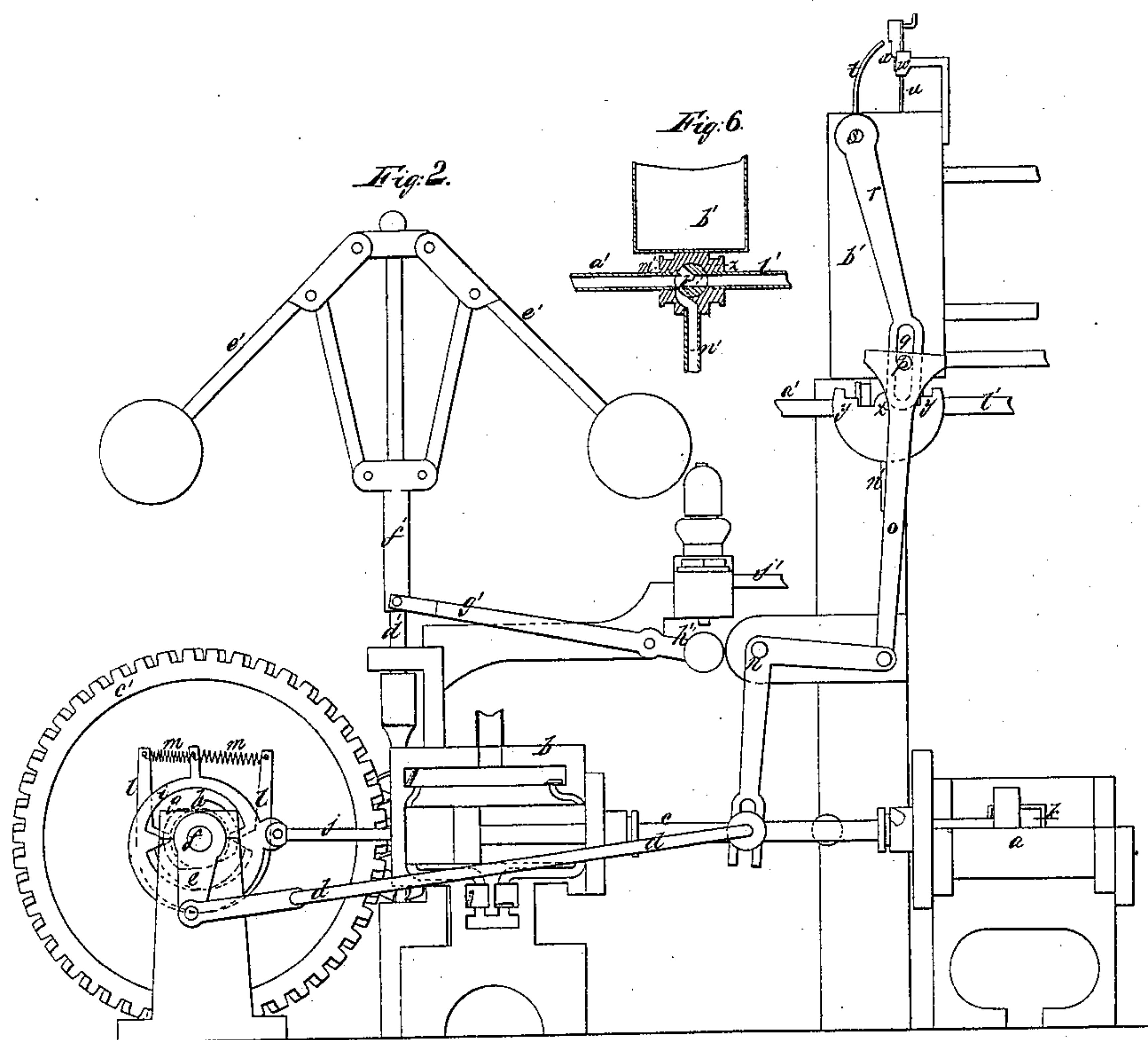
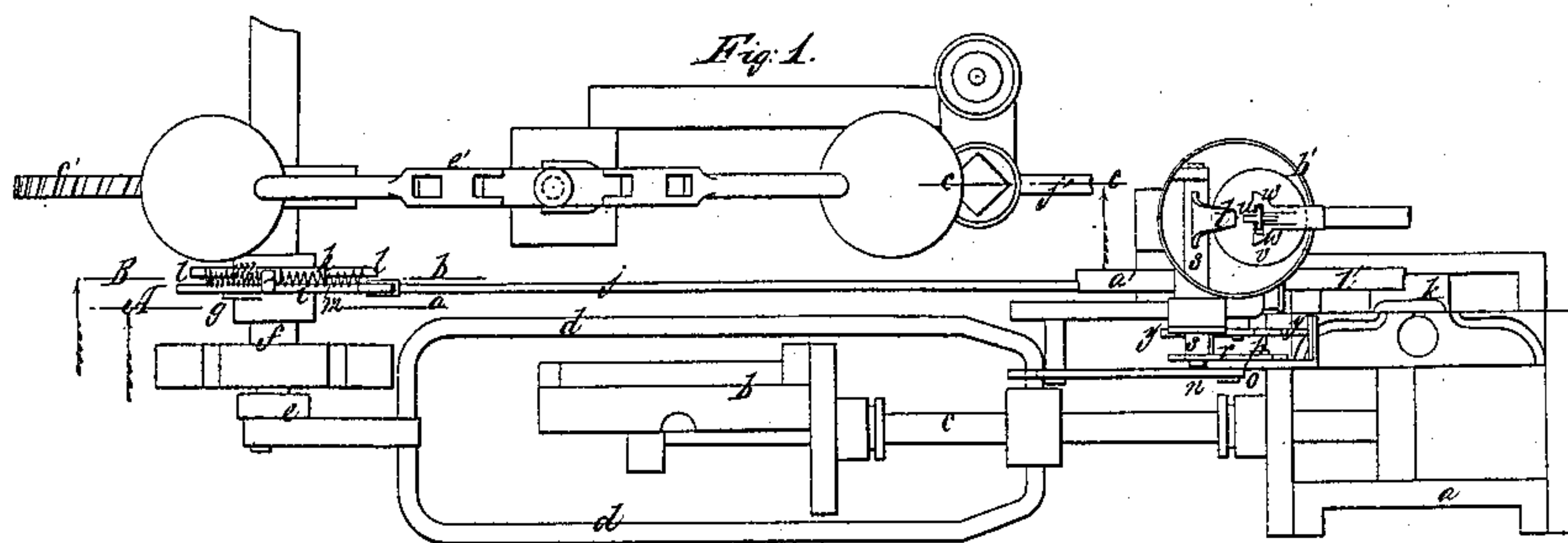


T. J. Sloan,

Steam-Boiler Water-Feeder,

No 10,432,

Patented Jan. 17, 1854.



UNITED STATES PATENT OFFICE.

THOMAS J. SLOAN, OF NEW YORK, N. Y.

APPARATUS FOR INDICATING THE ACTION OF THE FEED-PUMP TO STEAM-BOILERS.

Specification of Letters Patent No. 10,432, dated January 17, 1854.

To all whom it may concern:

Be it known that I, THOMAS J. SLOAN, of the city, county, and State of New York, have invented certain new and useful Improvements in the Method of Regulating the Supply of Water to Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a plan of the apparatus with parts in section; Fig. 2, a side elevation with parts in section; Figs. 3, 4, and 5, sections taken at the lines A, a, B, b, and C, c, of Fig. 1, and Fig. 6, a section through the supply cock or valve.

The same letters indicate like parts in all the figures.

The object of my invention is to give an alarm, whenever the feed pump of a steam boiler fails to work, that warning may be given that personal attention is required to insure safety, which invention is mainly intended to be used in connection with a hydrostat or instrument for indicating and regulating the height of water in steam boilers, secured to me by Letters Patent bearing date the 6th day of July 1852, in which the valve or cock that governs the quantity of water to be admitted into the boiler, is operated by any motor to insure the working thereof while at the same time the position of the said valve or cock is governed by a float within the boiler. The only danger attending the operation of this hydrostat is the possibility of the stoppage of the said motor by any cause whatever, which danger I have avoided by an apparatus, which, in such an event, gives an alarm, to give warning that the motor and the supply pump, or either, have ceased to operate. And the nature of my invention consists in combining with the motor which operates the supply cock or valve, and with the supply pump, or either, a mechanism that will blow a whistle, or give any other alarm, by the falling of a weight or by the tension of a spring, that personal attention may be given to the apparatus when either the motor or pump fails to work.

In the accompanying drawings a, represents a steam engine which may be such as are employed for working the supply pumps of steam boilers, and b, the supply pump with the eduction pipe leading to the boiler

to be supplied; the piston of the pump being on the end of the piston rod c, of the engine.

The piston rod c, is connected by a rod d, with a crank e, on the crank shaft f, provided with two cams g, and h, one of which acts on a lever i, connected by a rod j, with the stem of the slide valve k, of the engine. This lever i, embraces the cam by which it is acted upon alternately in opposite directions; and to keep the two faces of the lever alternately in contact with the cam g there is another bifurcated lever l, acted upon alternately in opposite directions by the other cam h, and springs m, m, are interposed between the one arm of the lever i, and the two arms of the lever l, by means of which, and the relative position of the two cams, the two faces of the lever i, are alternately kept in contact with the cam g, to give the required motion to the valve without the jar and noise such as would be produced by a bob or tilting lever. The piston rod c, is connected with one arm of a lever n, the other arm of which is jointed to a rod o, and the upper end of this rod is provided with a pin p, that slides in a slot q, in the lower end of the arm r, of a rock shaft s. This slot is slightly inclined to the line of the arm r, and shorter than the range of motion of the rod o, so that, as the rod is carried up, when the pin p, reaches the upper end of the slot, it vibrates the arm in one direction, and, in descending, vibrates it back, by reason of the line of motion of the rod being inclined to the line of the arm. This gives a reciprocating motion to the rock shaft s, which is provided with another arm t, the end of which, during the vibration, is carried toward and against and from the vertical stem u, of a float v.

The stem of the float is adapted to slide freely in ways w, and that side of it toward the arm t is formed with a series of step like projections x, each in succession projecting farther from the line of the stem, so that when the float is low down, the arm t, cannot vibrate so far as when the float is up, hence as the connecting rod o, descends its upper end cannot move back to the left so far when the float is down as when it is up.

The upper end of the connecting rod o, is provided with two spurs, one on each side of the pin p, and these spurs correspond with a series of notches or steps on the two stems y, y, of a vibrating cock or valve z,

which governs the supply pipe a' , leading from the supply pump to the boiler; and when the float is down, one of the spurs of the rod o , strikes one of the steps or notches on the arm of the valve stem, which turns the said cock or valve in one direction, that water may enter the boiler to supply the deficiency; and when the float is up, the other spur of the rod o , strikes one of the steps or projections on the other stem of the cock or valve by which it is turned in the opposite direction to close the passage and prevent water from being forced into the boiler. In this way it will be seen that the moment the arm t , is drawn from the stem, the float is free to move up and down, to take its position from the height of water in the boiler, and from this position, the motion of the upper end of the rod o , relatively to the notches on the valve stems, is determined, so that the spurs on the rod o , act correspondingly on the valve stems to open or close it, to suit the requirements of the boiler.

The float and arm t , are placed within a vessel b' , connected with the boiler by means of pipes above and below the water line, so that the supply of water shall be checked when there is a sufficiency of water in the boiler and vice versa. The float and all its connections are within this vessel, so that it can float freely and simply regulate the range of motion of the apparatus for operating the valve or cock. Instead of placing the float within a vessel connected with the boiler, it may be placed directly within the boiler.

The crank shaft is provided with a cog wheel c' , which communicates motion to the spindle d' of a fly ball governor e' , the arms of which are connected in the usual, or any appropriate manner with the slide f' , which is embraced by the end of a lever g' , and the other arm of the said lever acts upon the stem h' , of the valve i' , of a steam whistle, connected in the usual manner with the boiler by the steam pipe j' .

The fly balls of the governor should be made heavy so that the moment the motor ceases to operate, they will drop by gravity and operate the lever to open the passage leading to the whistle to give an alarm; but when the engine moves at the required velocity the balls rise and draw up the lever to permit the valve to close and stop the alarm. In this way, an alarm is always sure to be given, whenever the motor, which operates the supply cock or valve, stops, because the balls of the governor can be made so heavy as to insure the opening of the whistle valve or the starting of any other alarm.

The rotating cock or valve z , for regulat-

ing the supply of water to the boiler, is a three-way cock as represented in the separate section Fig. 6.

The passage or way k' when in the position represented, communicates with the pipe leading from the supply pump, and with the pipe l' , leading to the boiler, but when it is turned in the position represented by dotted lines, and the passage to the pipe l' , leading to the boiler is closed, the branch way m' , is in connection with the pipe a' , leading from the pump, and the main way k' , connects with a waste pipe n' leading to the reservoir which supplies the pump or to any other reservoir. In this way the pump can continue to work, notwithstanding the closing of the passage leading to the boiler.

It will be obvious from the foregoing that other modes may be devised for applying the principle or character of my invention, as for instance. Instead of the fly ball governor for operating the lever to open the alarm valve, or for starting any other alarm when the pump stops or fails to work, a sufficient weight may be suspended to the lever, and counterpoised by a vessel of water at the other end. And this vessel of water should be provided with a waste or discharge hole at the bottom, which will permit the water to run out as fast as water is supplied to the vessel by a waste pipe leading from the pump, so that while the pump continues to supply water the weight on the lever will be held up; but when the pump fails to work and furnish the supply to the vessel, the water will run out, and give the preponderance to the weight, which opens the valve and gives the alarm. And it will also be obvious that the fly ball governor, or its equivalent, whether working by weights or springs, can be connected either with the supply pump or with the motor which operates the supply valve of the hydrometer, although the best results will be obtained when the principle of my invention is applied in the mode particularly described and represented.

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

Combining with the motor which operates the supply cock or valve, and with the supply pump, or with either, as specified, a mechanism, substantially as specified, which when the said motor and pump, or either fail to operate, shall operate the valve of the whistle or other alarm, to give warning that the apparatus needs personal attention with the view to perfect safety, as specified.

THOS. J. SLOAN.

Witnesses:

WM. H. BISHOP,

CHAS. M. BAMBURGH.