

(No Model.)

2 Sheets—Sheet 1.

J. C. POTTS.

SHUTTLE OPERATING MECHANISM.

No. 357,097.

Patented Feb. 1, 1887.

FIG. 1.

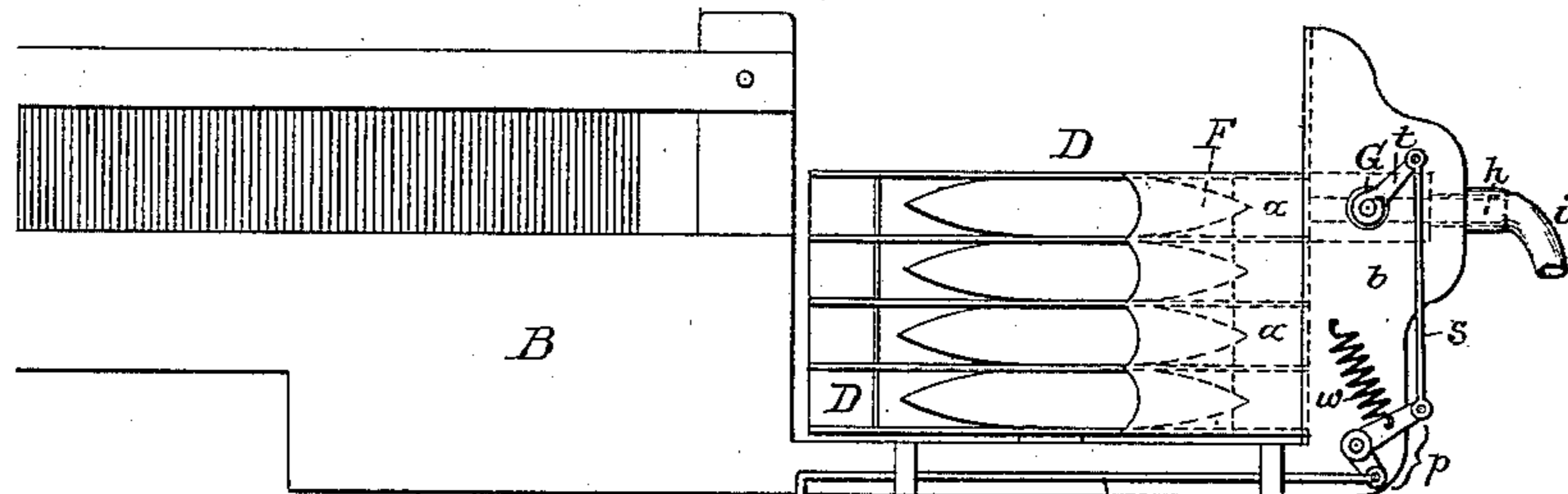


FIG. 3.

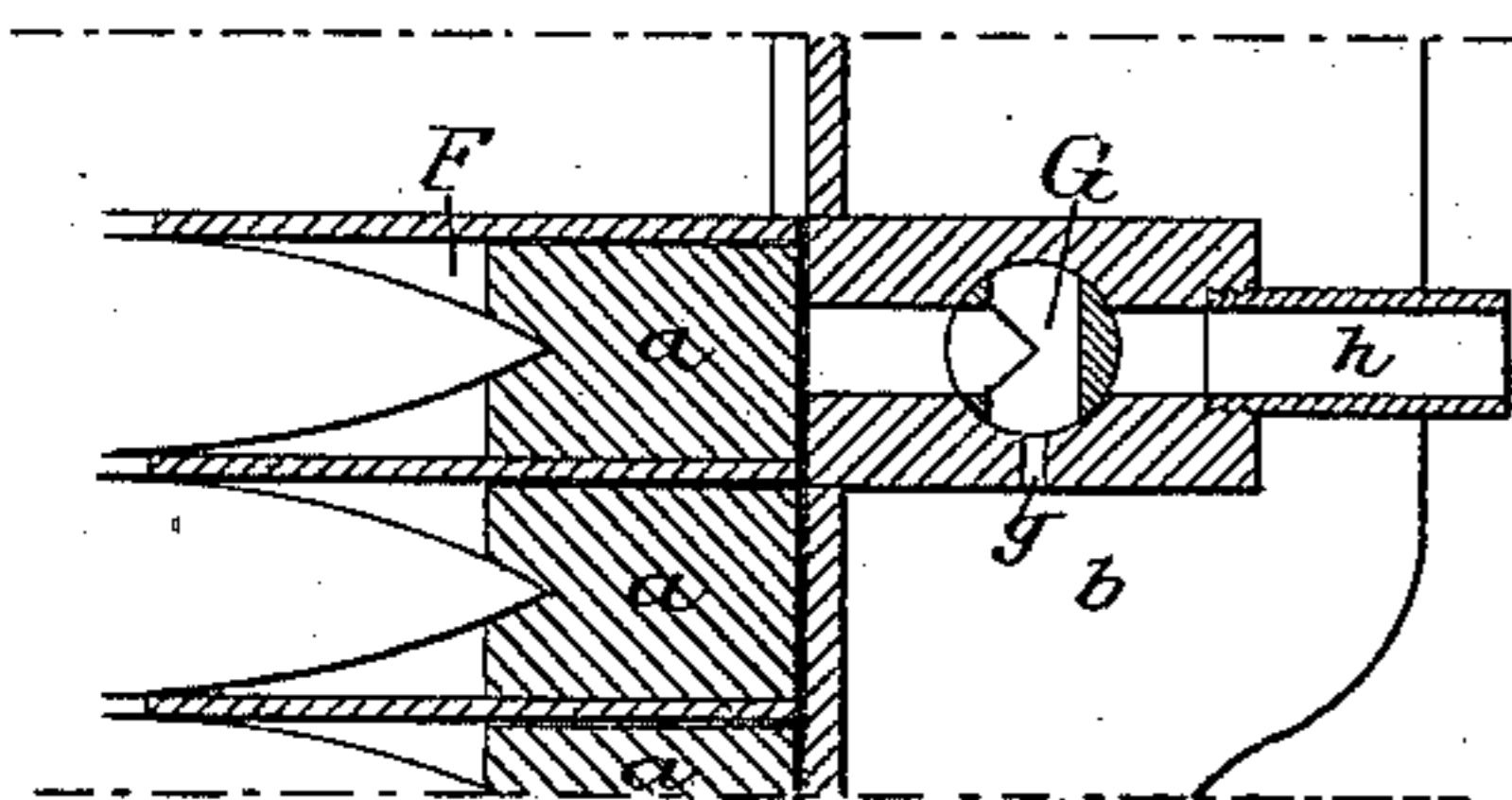


FIG. 4.

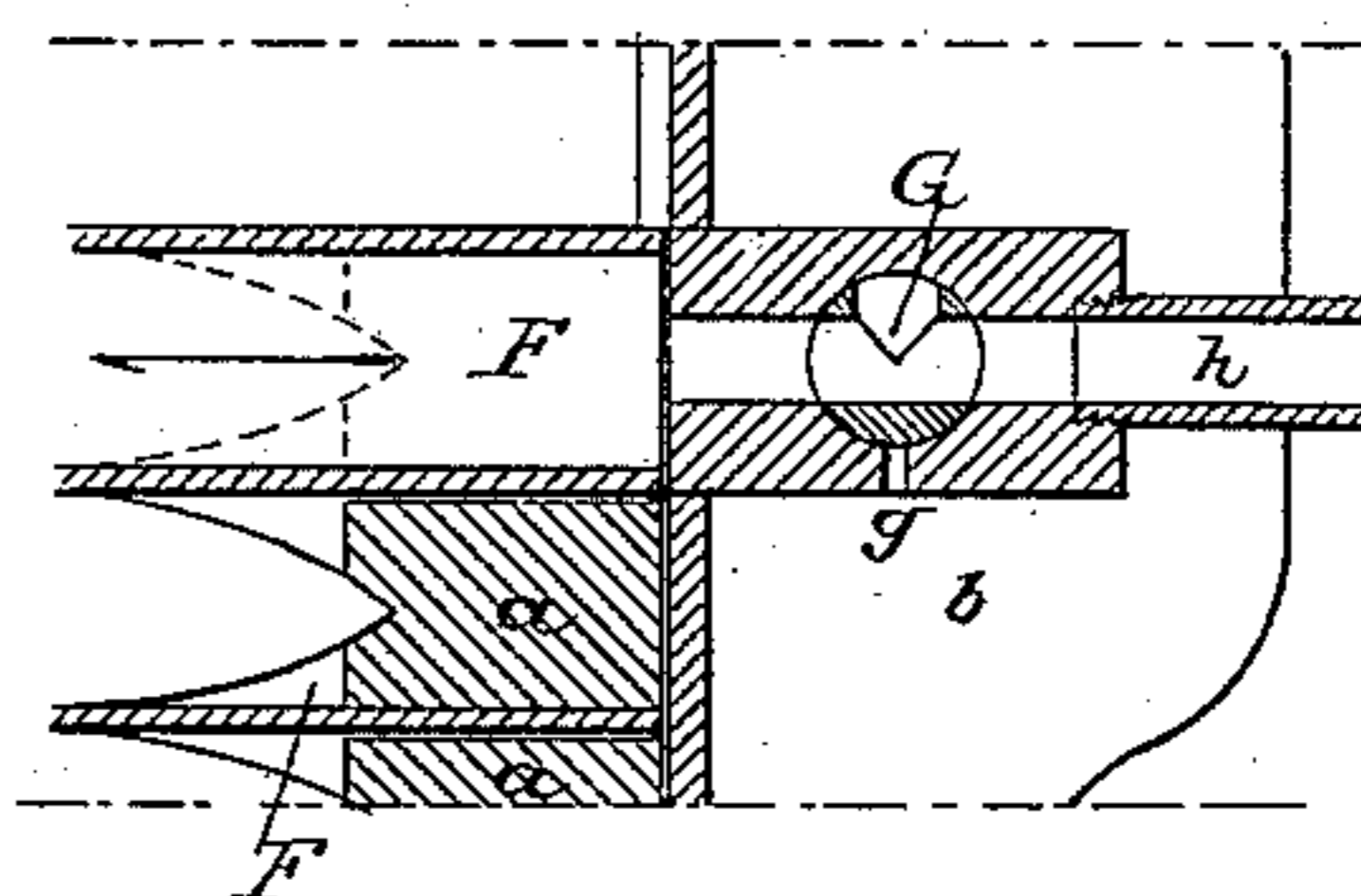


FIG. 2.

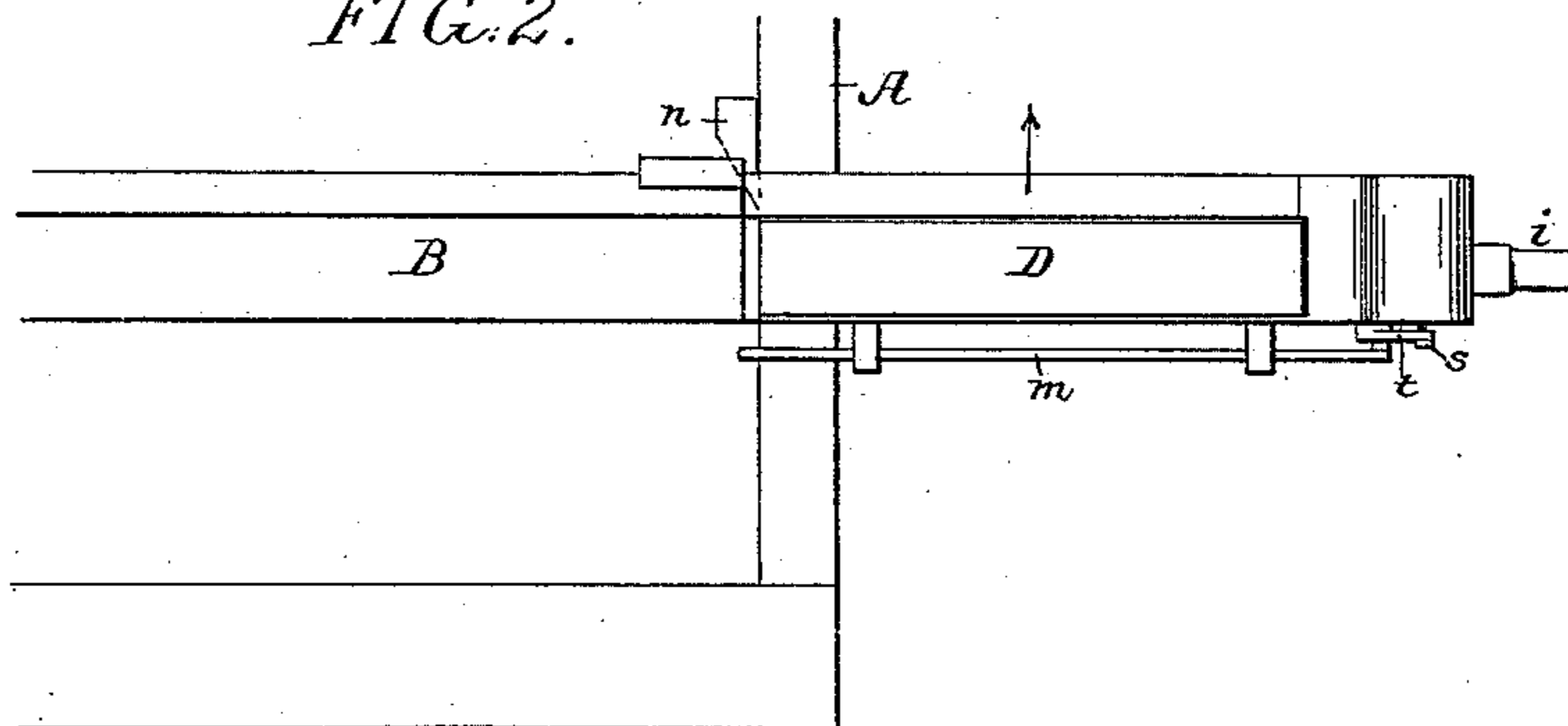
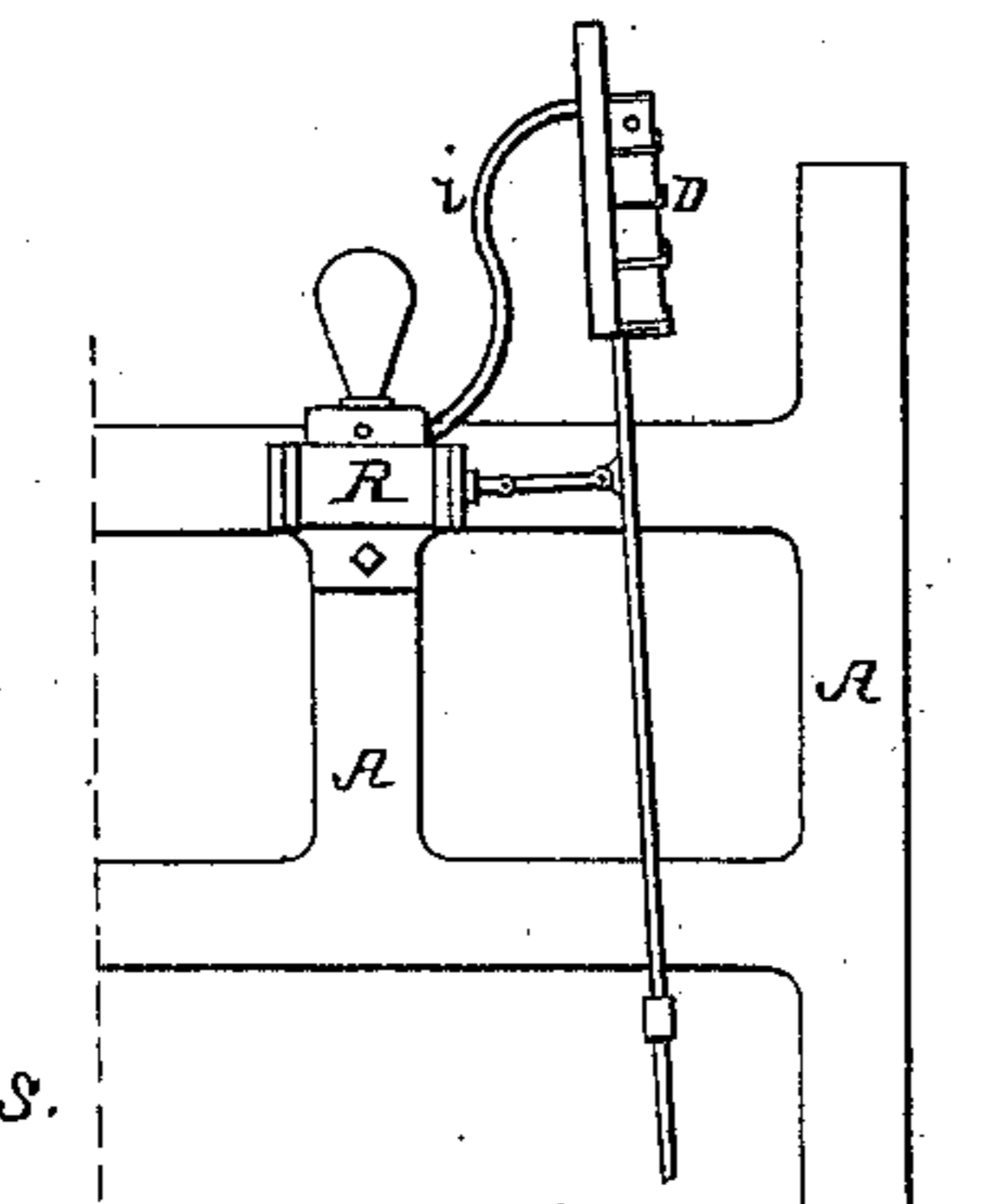
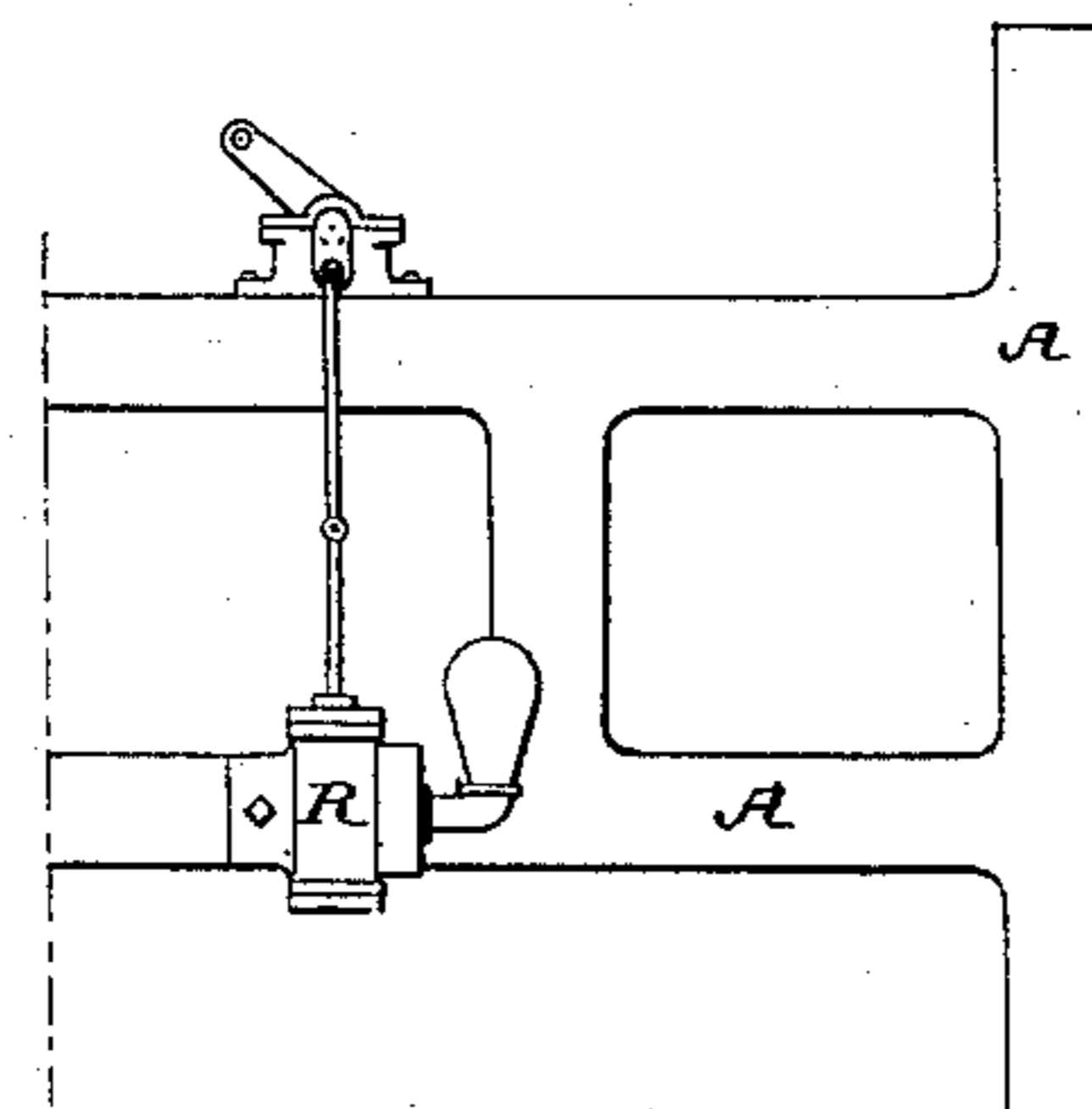


FIG. 5.



Witnesses:
David S. Williams.
Wm D. Conner.

FIG. 6.



Inventor:
Joseph C. Potts
by his Attorneys

Howson & Son

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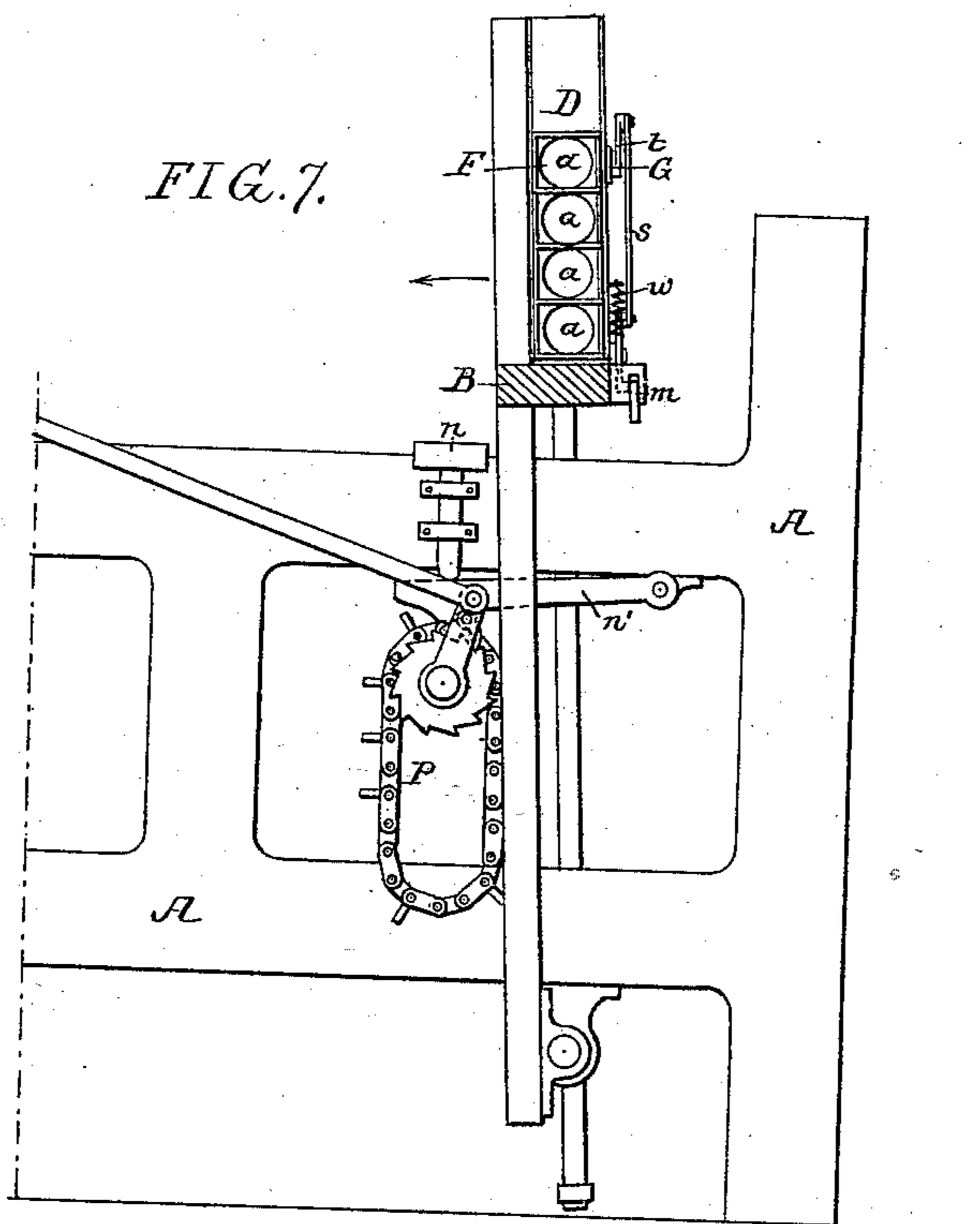
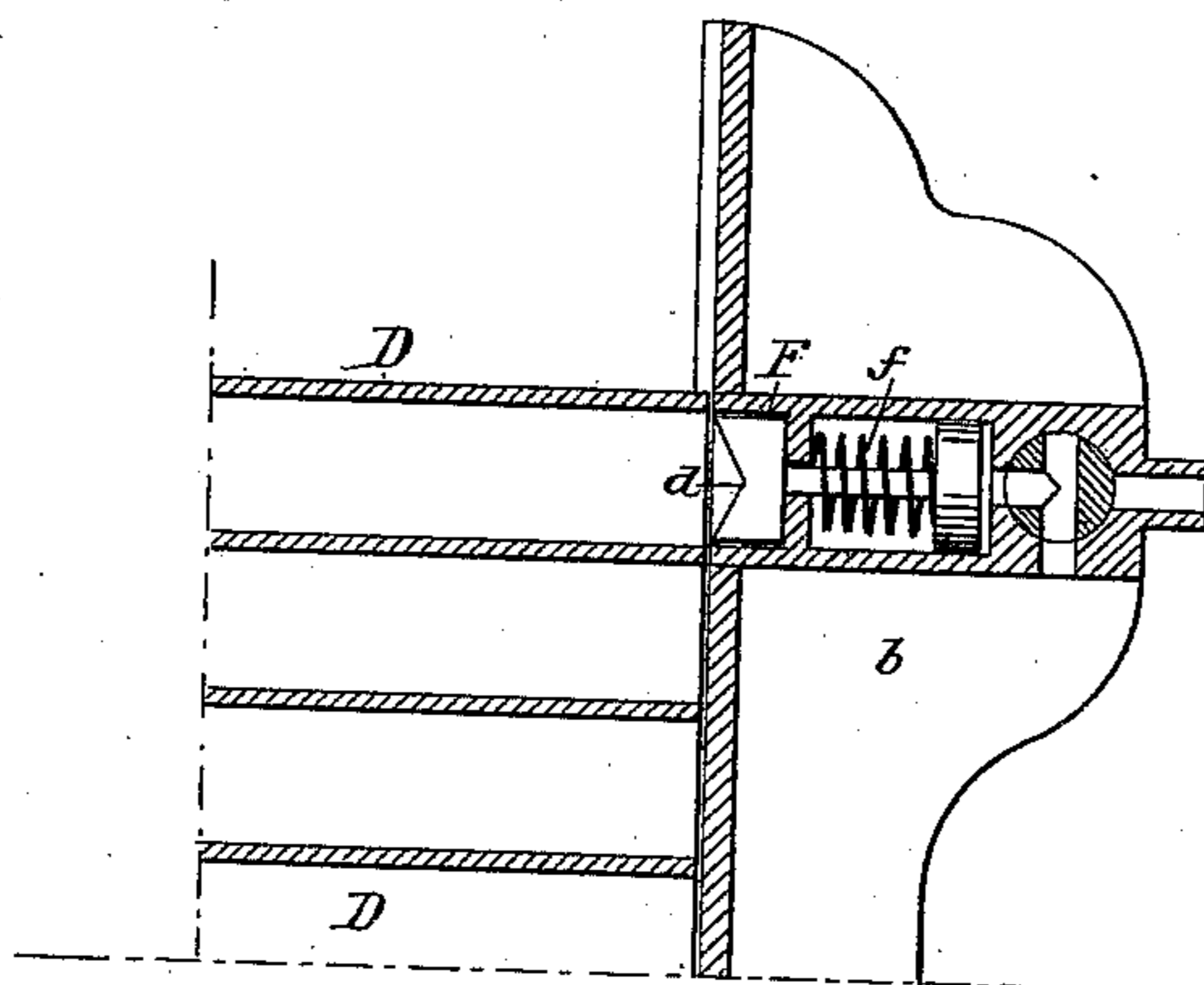


FIG. 8.



Witnesses:
David S. Williams,
William D. Conner.

Inventor:
Joseph C. Potts
by his Attorneys
Howson & Sons

UNITED STATES PATENT OFFICE.

JOSEPH C. POTTS, OF BERWYN, PENNSYLVANIA.

SHUTTLE-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 357,097, dated February 1, 1887.

Application filed August 28, 1886. Serial No. 212,070. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. POTTS, a citizen of the United States, residing at Berwyn, Pennsylvania, have invented certain Improvements in Shuttle-Operating Mechanisms for Looms, of which the following is a specification.

My invention relates to that class of looms in which the shuttles are actuated by means of picker-pistons operated by air or other fluid under pressure, the objects of my invention being to provide an effective means of utilizing this form of picker mechanism in looms having movable shuttle-boxes and to simplify and cheapen the devices for operating the valves which govern the flow of air or other fluid to the picker-cylinders.

In the accompanying drawings, Figure 1 is a front view of sufficient of a loom to illustrate my invention, the frame being in section. Fig. 2 is a plan view of part of the same; Figs. 3 and 4, sectional views, on a larger scale than Fig. 1, showing the construction of the valve for governing the operation of the picker; Figs. 5 and 6, diagrams illustrating modes which may be adopted for securing a supply of air under pressure for operating the picker; Fig. 7, a side view of part of the loom with the lathe in section, showing one of the features of the invention; and Fig. 8, a sectional view illustrating a modification of part of the invention.

In Fig. 1, A represents part of one of the side frames of the loom, and B part of the lathe, which has the usual vertically-guided shuttle-boxes, D, the latter being operated by any of the devices common for the purpose, this forming no part of my invention. Each shuttle-box is closed at and near the outer end, so as to form a cylinder, F, (shown in Figs. 3 and 4,) this cylinder containing a tight-fitting piston, *a*, which forms the picker for the shuttle.

In the rear standard, *b*, of the lathe, beyond the shuttle-boxes, is a chamber for the reception of a three-way valve, G, which may be turned, as shown in Fig. 3, so as to open communication between the interior of the cylinder F of the box in line therewith and a discharge-passage, *g*, or to the position shown in Fig. 4, so as to cut off the discharge-passage and open communication between the interior of the cylinder F and a pipe, *h*, which is in

communication, through a flexible tube, *i*, or other equivalent conveyer, with a reservoir of air or other fluid under pressure. When the valve is in the position shown in Fig. 4, therefore, the piston *a* has a forward impulse imparted to it, and is forcibly expelled from the closed outer end or cylinder F of the box, the propelling impulse thereby imparted to the shuttle being sufficient to drive it across the shuttle-race and into the box at the opposite end of the lathe. On returning the valve to the position shown in Fig. 3 the flow of air is cut off and a communication is opened between the contracted passage *g* and the cylinder F of the box which may be in line with the valve, so that when, on a shuttle's entering the box, the piston *a* is driven back into the cylinder, the air, being compelled to escape through the contracted passage *g*, forms a cushion and prevents the piston from being driven forcibly against the abutment of the lathe.

The cylinder F might, if desired, be formed in the standard *b* of the lathe, and the piston *a* might have a rod provided with a picker-head, *d*, and be retracted by a spring, *f*, as shown in Fig. 8; but the construction shown in Figs. 1, 3, and 4 is preferred, as each box then carries its own picker, and there is no danger of the jamming of the boxes, as there would be if the picker-head *d* (shown in Fig. 8) was not properly retracted into the recess in the lathe-standard *b*.

In order to effect the automatic adjustment of the valve G to the operative position shown in Fig. 4 as the lathe reaches the limit of its rearward movement and to restore the valve to the position for discharge as the lathe swings forward, I provide a rod, *m*, which is adapted to and is free to slide longitudinally in suitable bearings on the front of the lathe, the inner end of this rod being bent so as to be under the influence of a cam, *n*, on the inner side of the frame A of the loom, the outer end of the rod being connected to one arm of a bell-crank lever, *p*, hung to the lathe, the other arm of which lever is connected by a rod, *s*, to an arm, *t*, on the spindle of the valve G. As the lathe swings rearward, therefore, the rod *m*, under the influence of the cam *n*, Fig. 2, is drawn inward, thereby depressing the arm *t* of the valve and moving the latter from the position shown in Fig. 3 to that shown in Fig.

4, so as to provide for the ejection of the shuttle from the box, and as the lathe swings forward and the rod *m* passes from under the influence of the cam said rod is caused to
 5 move outward, either by the influence of a spring, *w*, acting on the lever *p*, or by a spring acting on the rod, so as to again move the valve to the position shown in Fig. 3 and permit the piston to be forced outward in the
 10 shuttle-box cylinder when the shuttle enters the box.

As the picking mechanism at one side of the lathe must be inoperative when that at the other side acts, the cam *n* is guided vertically
 15 on the side of the loom and is acted on by a lever, *n'*, under the influence of a pattern-chain, *P*, Fig. 7, the drum of which is operated by pawl-and-ratchet mechanism from the crank-shaft of the loom, or in any other suitable
 20 manner, so that when it is not desired to pick from one end of the lathe the cam on that side of the loom is depressed, so as to fail to act on the rod *m*, the cam at the opposite side of the loom being raised into operative posi-
 25 tion.

The supply of air or other fluid under pressure may be derived from a pipe running throughout the room in which the looms are situated, or each loom may, if desired, be pro-
 30 vided with its own pump and pressure-reservoir. Thus in Fig. 5 I have shown a pump, *R*, operated directly by connection with the lathe, and in Fig. 6 I have shown a pump operated from the crank-shaft.

35 I am aware that it has been proposed to effect the operation of a loom-shuttle by means of picker-pistons adapted to cylinders on opposite sides of the lathe and operated by air or other fluid under pressure, and therefore I
 40 make no broad claim to this feature of my invention; but all prior looms of this character, to the best of my knowledge, were single-shuttle looms, whereas my invention consists, mainly, in adapting this form of shuttle-picker
 45 to a drop-box loom, a further feature of my invention being the simplifying and cheapening of the devices for operating the valves

which govern the flow of air or other fluid to the picker-cylinders, such devices having hitherto been both cumbrous and expensive. 50

I therefore claim as my invention—

1. The combination of the lathe, the shuttle-boxes, each forming a cylinder, a picker-piston in each cylinder, a reservoir containing air or other fluid under pressure, and a valve
 55 controlling the communication between said reservoir and the cylinders, all substantially as specified.

2. The combination of the lathe, the picker-piston and its cylinder, the pressure-reservoir, 60 a passage providing communication between said reservoir and the cylinder, a discharge-passage of contracted area, and a three-way valve, whereby the cylinder may be put in communication either with the pressure-reser- 65 voir or with the contracted discharge-passage, all substantially as specified.

3. The combination of the lathe, the picker-piston and its cylinder, the pressure-reservoir, the valve controlling the communication be- 70 tween said reservoir and the cylinder and having a projecting arm, an operating-rod guided on the lathe, a cam whereby said rod is actuated as the lathe swings, and a bell- 75 crank lever, one arm of which is connected to the operating-rod and the other to a rod on the valve-arm, all substantially as specified.

4. The combination of the lathe, the picker-piston and its cylinder, the pressure-reservoir, the controlling-valve, an operating-rod there- 80 for, means whereby the movement of said rod is transmitted to the valve, a cam for actuating the rod, a pattern-chain and operating mechanism therefor, and devices whereby on the movement of the pattern-chain the cam is 85 moved into or out of engagement with the rod, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH C. POTTS.

Witnesses:

WILLIAM D. CONNER,
 HARRY SMITH.