D. Bickford

Shuttle Motion.

No. 51,006. Patented Nov. 21, 1865.

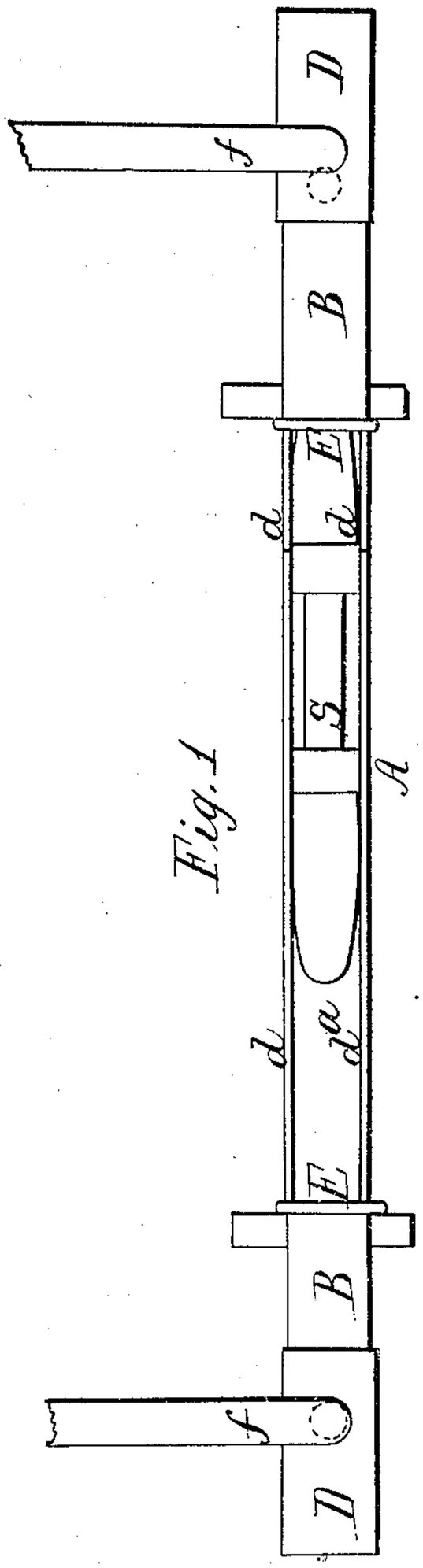

Fig. 1

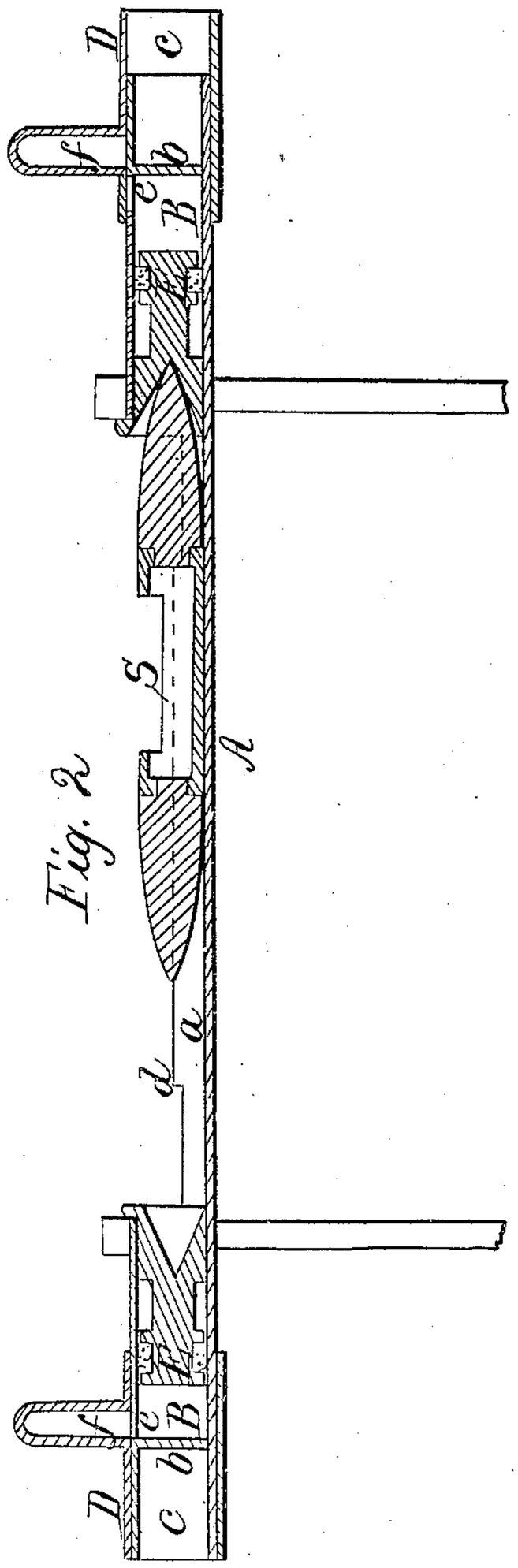

Fig. 2

Inventor

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by his Attorney
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UNITED STATES PATENT OFFICE.

DANA BICKFORD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MECHANISM FOR OPERATING LOOM-SHUTTLES.

Specification forming part of Letters Patent No. **51,006,** dated November 21, 1865.

To all whom it may concern:

Be it known that I, DANA BICKFORD, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Mechanism for Operating the Shuttle of a Loom or for Effecting a Reciprocating Motion of an Object; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view of the race or race-beam of a loom as provided with my invention. Fig. 2 is a longitudinal section of it.

A lay for receiving my invention is to be operated in the usual manner. The upper surface of the said lay is or may be channeled lengthwise, as shown at *a*, the lay being represented at A. This channel or the race of the lay terminates at each of its ends at the mouth of one of two cylinders, B B, arranged in prolongation of the race-beam. The outer end of the air-receiving part of each cylinder should be closed by a partition, *b*, extended across the cylinder, that portion *c* of the cylinder which projects beyond the said partition being for the support of a tube, valve, or jacket, D, which encompasses and slides freely on the cylinder. In each cylinder there is a piston, E, which, when projected to the limit of its motion beyond the extension, brings up against shoulders or stops *d d* formed in or otherwise properly applied to the race-beam. There is an air passage or port, *e*, leading through the side of each cylinder B, and there is also to each tubular valve D an air-inlet tube, *f*, which extends from the side of the valve, and opens into its interior space. The inlet-tubes of the two valves, when the apparatus is in use, should communicate by flexible tubes or proper conduits with an apparatus for forcing air through the tubes and into the valves, or into either of the cylinders when its valve may be in such a position on it that air from the valve-tube will enter the port of the cylinder; and, furthermore, the valves, when in use, should have a mechanism applied to them to slide them simultaneously on the cylinders and on and off the ports thereof in such manner that while air may be passing into the port of one cylinder in order to move the piston forward, the port of the other may be open in order to allow the air to be driven out of the latter cylinder by its piston while being driven into the cylinder.

I have not represented in the drawings any mechanism for operating the valves or for forcing air into them, as my present invention relates especially to the combination of the cylinders and pistons and their valves and ports with the lay of a loom, the valves to be moved in manner as described, or by any proper mechanism, or by manual labor. The apparatus for condensing air and supplying such condensed air to the cylinders may be of any proper construction or character for such purpose.

An equivalent for the air-conduits and the valves and ports and air-compressing apparatus as described would be an apparatus which would alternately force air into each cylinder and extract it therefrom, the air of one cylinder being drawn therefrom during the period of forcing air into the other cylinder.

By the operation of my invention the shuttle, which is shown at S, will be moved alternately across the race-beam by the action of the pistons. The air, on being suddenly forced in considerable volume into either cylinder, will drive the piston thereof smartly forward in such manner as to cause it to move the shuttle through the race-trough and against the other piston, which will have been driven into its cylinder, and will have forced the air in the said cylinder to escape through the open port thereof. A movement of the valves next takes place, so as to cause air to enter the last-named cylinder and the port of the other cylinder to be opened, immediately on the occurrence of which the shuttle will be driven back over the race-beam.

I claim as my invention—

1. The combination of the cylinders, pistons, valves, and ports, or their equivalents, arranged and to operate together substantially in manner and for the purpose specified.

2. The combination of the cylinders, pistons valves, ports, and piston-stops, or their equivalents, arranged substantially in the manner and for the purpose set forth.

DANA BICKFORD.

Witnesses:

R. H. EDDY,

F. P. HALE.