

H. Allen.
Disintegrating Mach.
N^o 87,387. Patented Mar. 2, 1869.

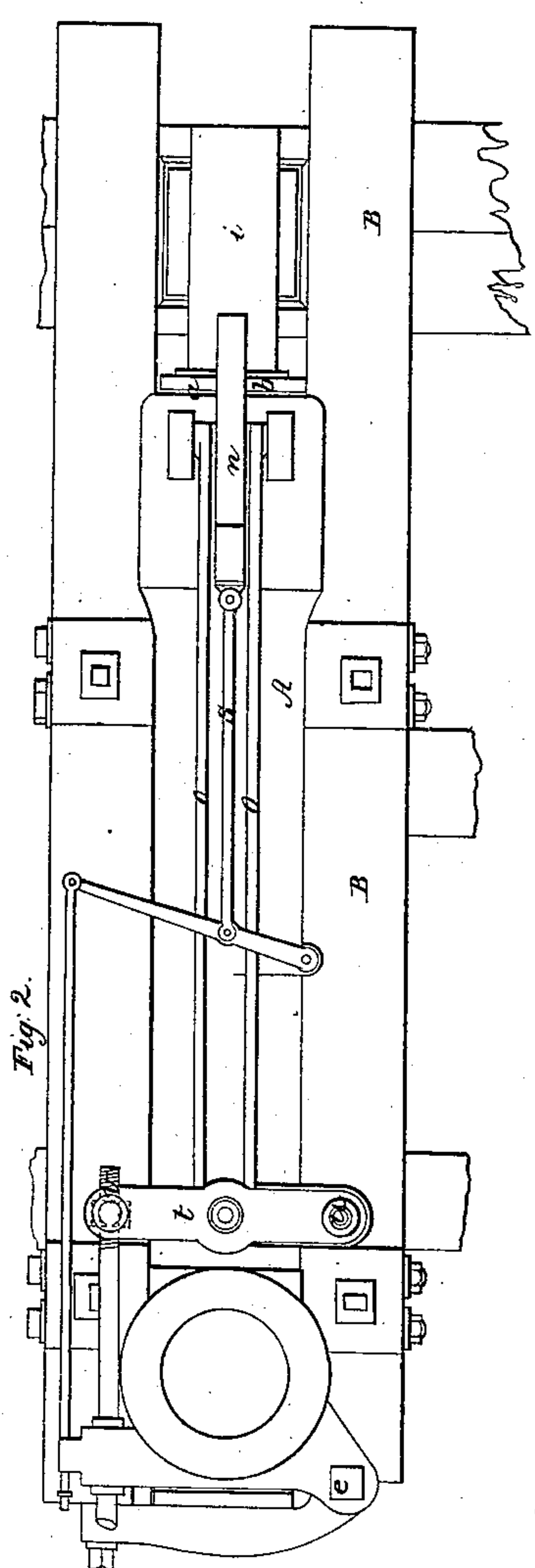


Fig. 2.

Witnesses:
Chas. Taylor.
Wm. A. Rogers.

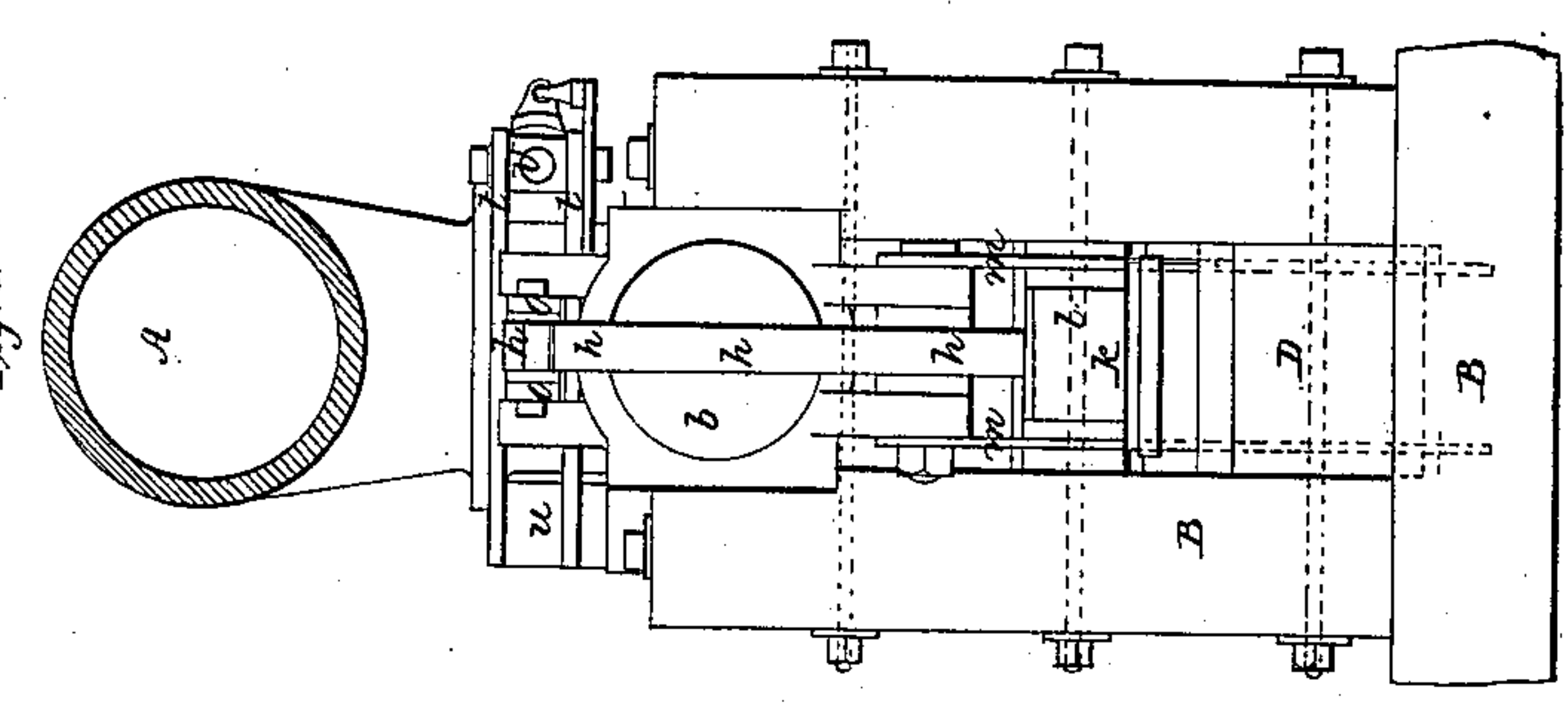


Fig. 3.

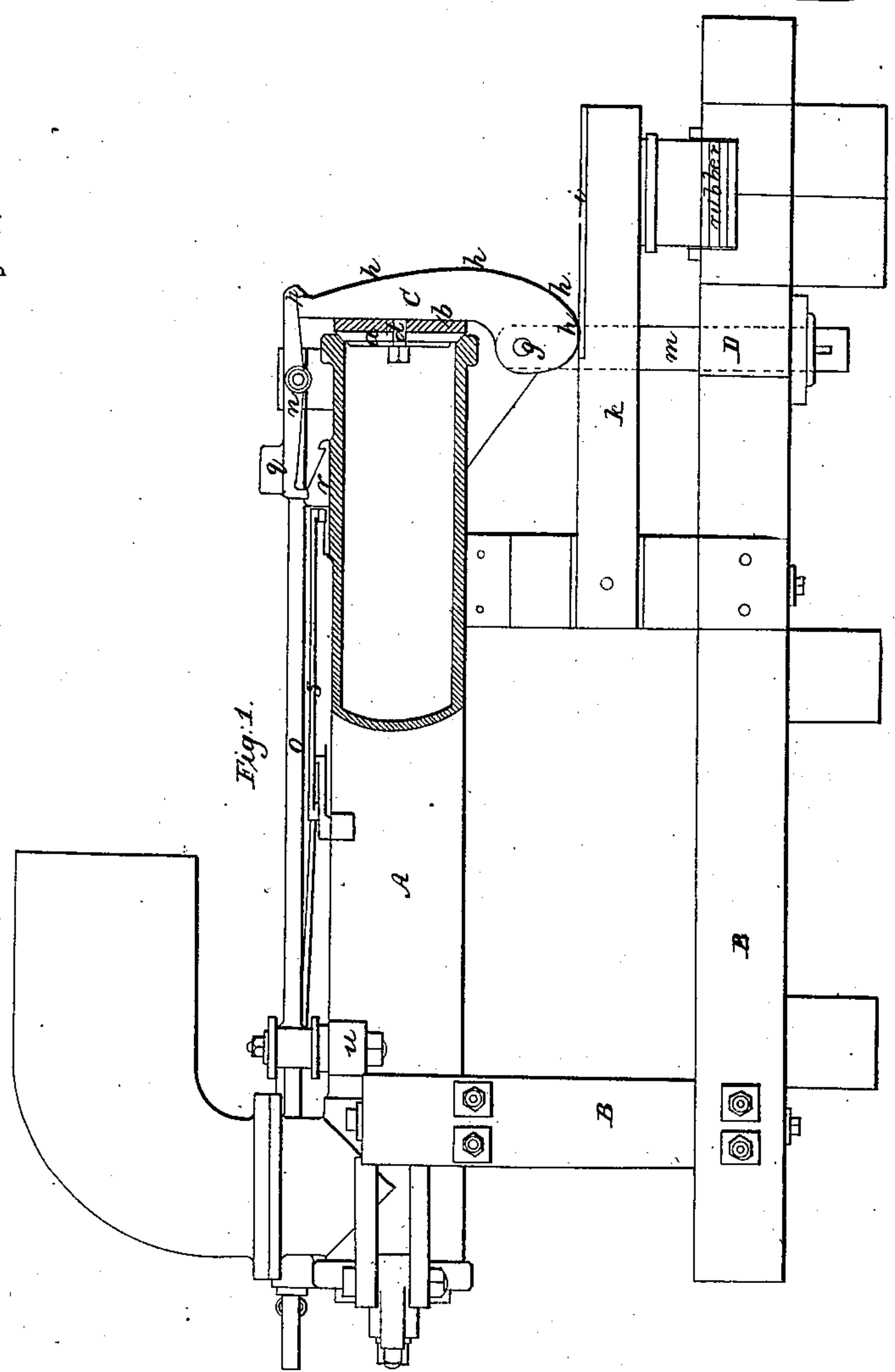


Fig. 1.

Inventor:
Moratio Allen

United States Patent Office.

HORATIO ALLEN, OF NEW YORK, N. Y., ASSIGNOR TO THE AMERICAN FIBRE COMPANY.

Letters Patent No. 87,387, dated March 2. 1869.

IMPROVEMENT IN VALVES OF STEAM-GUNS FOR SEPARATING AND DISINTEGRATING FIBRES.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern :

Be it known that I, HORATIO ALLEN, of the city, county, and State of New York, have invented certain new and useful Improvements in Fibre-Gun Valves, and in apparatus connected therewith; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

The fibre-gun (for description of which in detail see Lyman's patent for disintegrating materials of vegetable growth) is an iron cylinder, of usually twelve inches diameter, twenty-four feet long. The ends of this cylinder are closed by valves of the full diameter of the inside of cylinder. These valves, when closed, are to be steam-tight against a pressure of two hundred pounds per square inch. The valve at the discharging-end is to be readily disengaged, so that the contents of cylinder may be discharged as suddenly as possible.

The combinations by which I make a tight valve when closed, a valve easily discharged, and provide for the control of an arm which carries the valve when discharged, are presented in drawings herewith.

Figures 1, 2, and 3, present three views of the combination.

A is the fibre-gun, being an iron cylinder, usually twelve inches diameter, twenty-four feet long, and one inch thick.

B is the frame-work, of heavy timber, which carries the gun.

At one end of the cylinder is the discharge-valve; at the other, the loading-valve. The valve-seats are conical, being in the ends of the cylinder.

A conical valve, *a*, made of lead, closes the conical seat. The lead valve is about one inch thick, the lesser diameter of the cone being about twelve inches for a twelve-inch gun, and the large diameter about twelve and a half inches.

The lead valves are carried by an iron plate, *b*, and the iron plate is fastened to an arm, *c*, being bolted to it by a single bolt and nut, *d*.

The arm, at the loading-end, is connected with the cylinder by a hinge-joint at *e*, on which the arm swings in a horizontal plane, and the arm is drawn close to the cylinder, and the lead valve forced into its seat by means of nut and screw, as shown in the drawings.

The arm *c*, at the discharge-end, is connected with the cylinder, on its lower side, by a hinge-joint at *g*, on which the arm swings in a vertical plane.

To control the motion of the arm when the gun is discharged, its exterior surface, *h h h h*, is made of a curved form, as shown in the drawing.

Below the arm, and in contact with it, is the iron plate *i*, carried by the oak plank *k*, which is six to eight inches thick, and is attached to the frame B by an iron

pin, *l*, on which the oak plank is free to turn. The timber D, a part of the frame B, is six to eight inches below the oak plank, and between the oak plank and the timber D is a body of rubber, eight to ten inches square, and eight to ten inches deep.

The iron pin *g*, on which the arm *c* swings, is firmly connected with the timber D by two side-plates, *m m*, which pass through the timber D, and keyed with washer. These plates prevent the separation of the timber D from the cylinder.

To draw and hold the valve to its seat, the double lever *n* is used. This lever has its fulcrum on an iron pin, the ends of which are carried in a horizontal groove on top of cylinder, and to the same pin are attached the ends of the rods *o o*, by which the pin forming the fulcrum of the lever *n* can be moved lengthwise the cylinder.

One end of the lever *n* is formed with a catch, *p*, as shown in the drawing, which catches over the top-end of the arm when in a vertical position, as represented.

The other end of the lever, which is loaded with a weight, *q*, rests on an inclined plane, *r*, carried by a groove in the top side of the cylinder.

The inclined plane *r* is movable lengthwise the cylinder, by rod *s*.

The rods *o o*, by which the lever *n* is moved lengthwise the cylinder, are attached to the centre of the lever *t*, (this lever has its centre at *u*,) and at the other end are attached the nut and screw *v*. The rod on which the screw *v* is cut, is held against endwise motion in a lug on the cylinder. When the screw *v* is turned, the lever *t*, and through it and rods *o o*, the lever *n* will have motion lengthwise the cylinder.

The use of these combinations is as follows:

The valve *a* being put in its seat, when the inclined plane *r* is drawn back, the catch-end of the lever is caught on the upper end of the arm. This being done, the inclined plane *r* is pushed forward, and by its action the catch-end of the lever *n* is forced down on the upper end of the arm. This being done, the screw *v* is turned by its handle, and, through the lever *t* and the arm *c*, the lead valve is forced into contact with its seat with great power.

When the gun is to be discharged, the inclined plane *r* is drawn back, and the end of the lever which rested on it is then free to fall, (a slight blow on it will cause it to fall,) which will raise the other end, and thus disengage the other end from the arm. As soon as the arm is disengaged, the valve will no longer be held in its seat. The power of steam will then force the valve and arm from the gun, and with great velocity.

The arm, when thus thrown from the gun, will be brought to rest by the action of the arm on the plate with which it is in contact. As the arm begins to turn on its centre, it forces down the oak plank *k*, and

begins to compress the rubber below it. As the arm continues to turn, the leverage with which the arm acts on the oak plank increases, in consequence of the curved form of the arm.

In practice it is found that the resistance of the compressed rubber, in combination with the curved form of the arm, effects the bringing the valve to a state of rest in a satisfactory manner.

In conclusion I would observe, that while the herein-described arrangement of the buffer is productive of satisfactory results, the details of construction and arrangement may be varied in many respects, without departing from the principle of this portion of my invention, which, from the foregoing description, will be understood to consist in providing an elastic or yielding buffer to receive the stroke of the valve. And so with respect to the mechanism for locking the lead valve, the construction of the same can be varied, or, if desired, the means heretofore employed for the purpose may be used.

What I claim, therefore, and desire to secure by Letters Patent, is—

1. The employment, in connection with the discharge-valve of a fibre-gun, of an elastic or yielding buffer, to receive the impact or stroke of the valve, substantially as and for the purposes set forth.

2. The discharge-valve, and its vibratory supporting-arm, having a curved exterior surface, as described, in combination with a yielding buffer, upon which the curved surface of said arm, when the valve is thrown back, acts, substantially in the manner specified.

3. The construction and arrangement, with relation to the hinged discharge-valve and its supporting-arm, of the hinged buffer, and the rubber, or other elastic body, upon which said buffer rests, as herein set forth and shown.

4. The employment, with the fibre-gun, of the conical lead valve, for closing the loading or the discharge-aperture of the gun, in combination with the means herein described, or their equivalent, for forcing and holding said lead valve in its conical seat substantially as and for the purposes set forth.

5. The combination, with the valve-supporting arm or frame, of the double-catch lever and inclined plane, together with the means, substantially such as herein described, for actuating said lever and inclined plane, under the arrangement and for operation as set forth.

HORATIO ALLEN.

Witnesses:

GEO. E. LEQUIN,
FRED. W. CHILD.