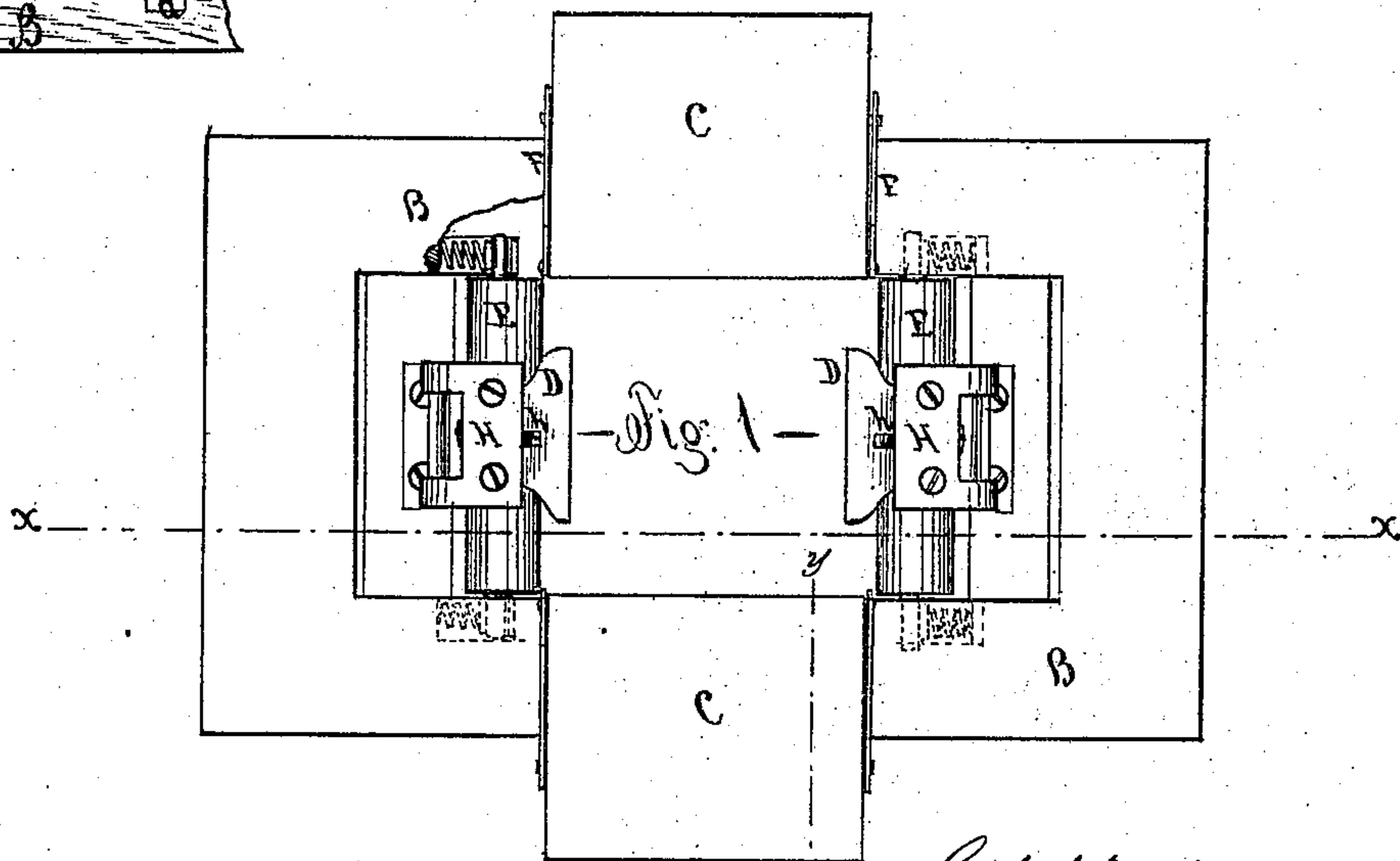
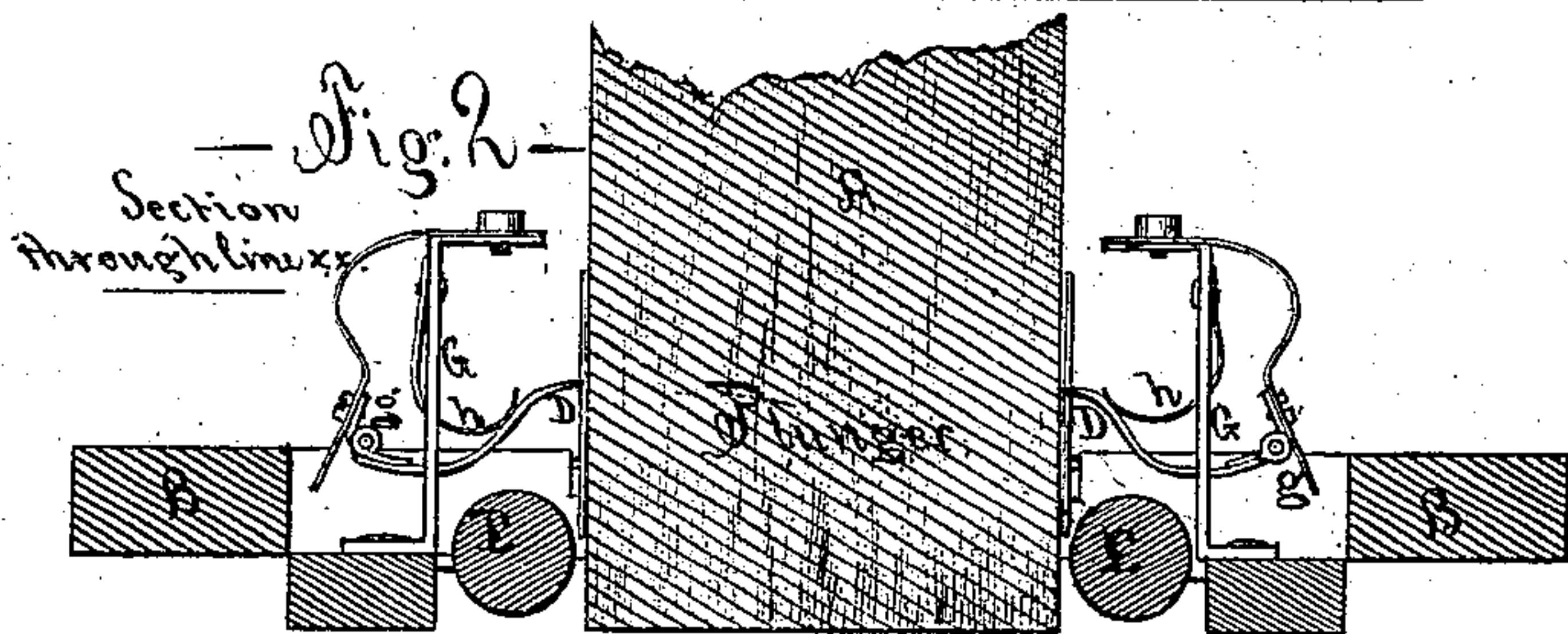
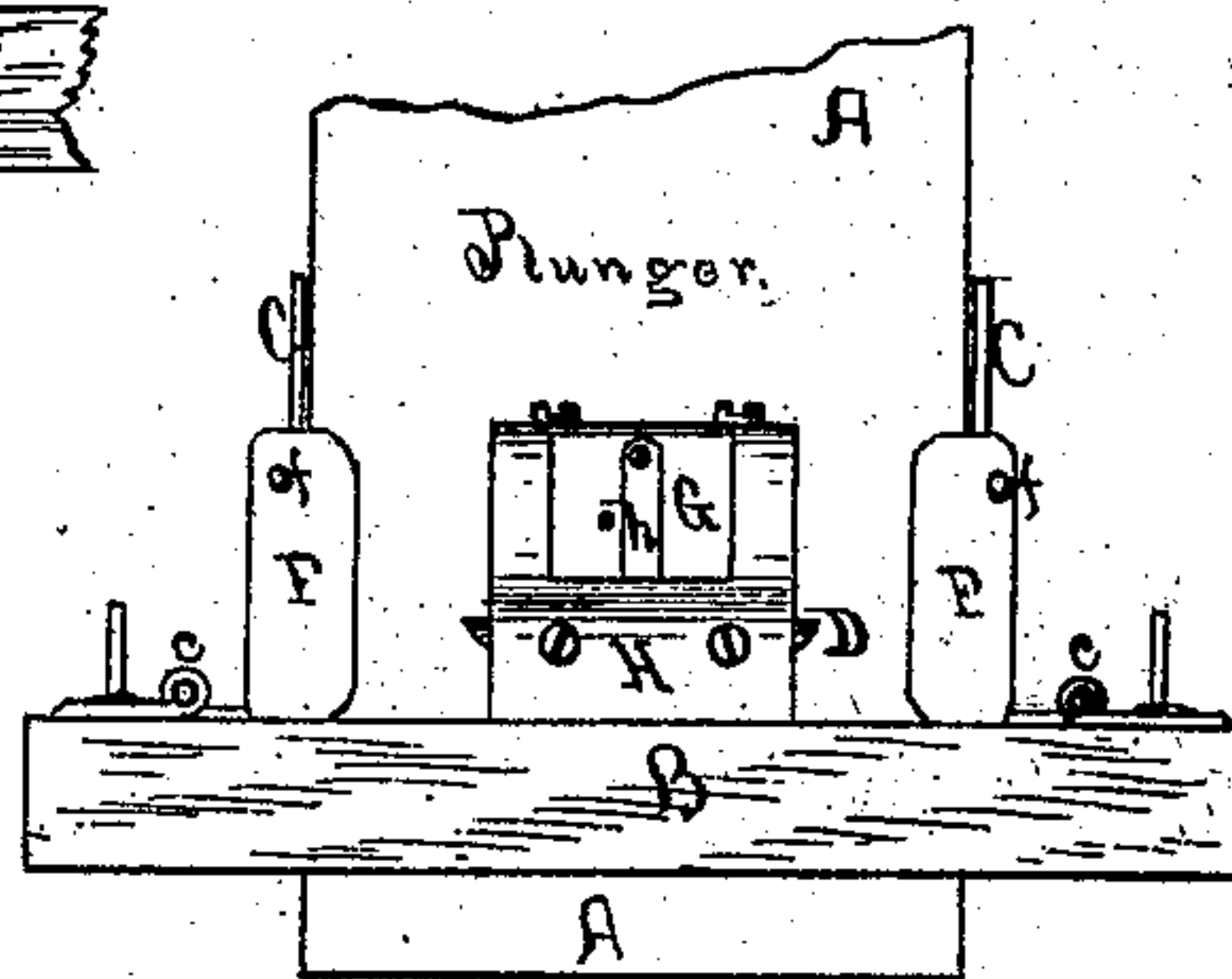
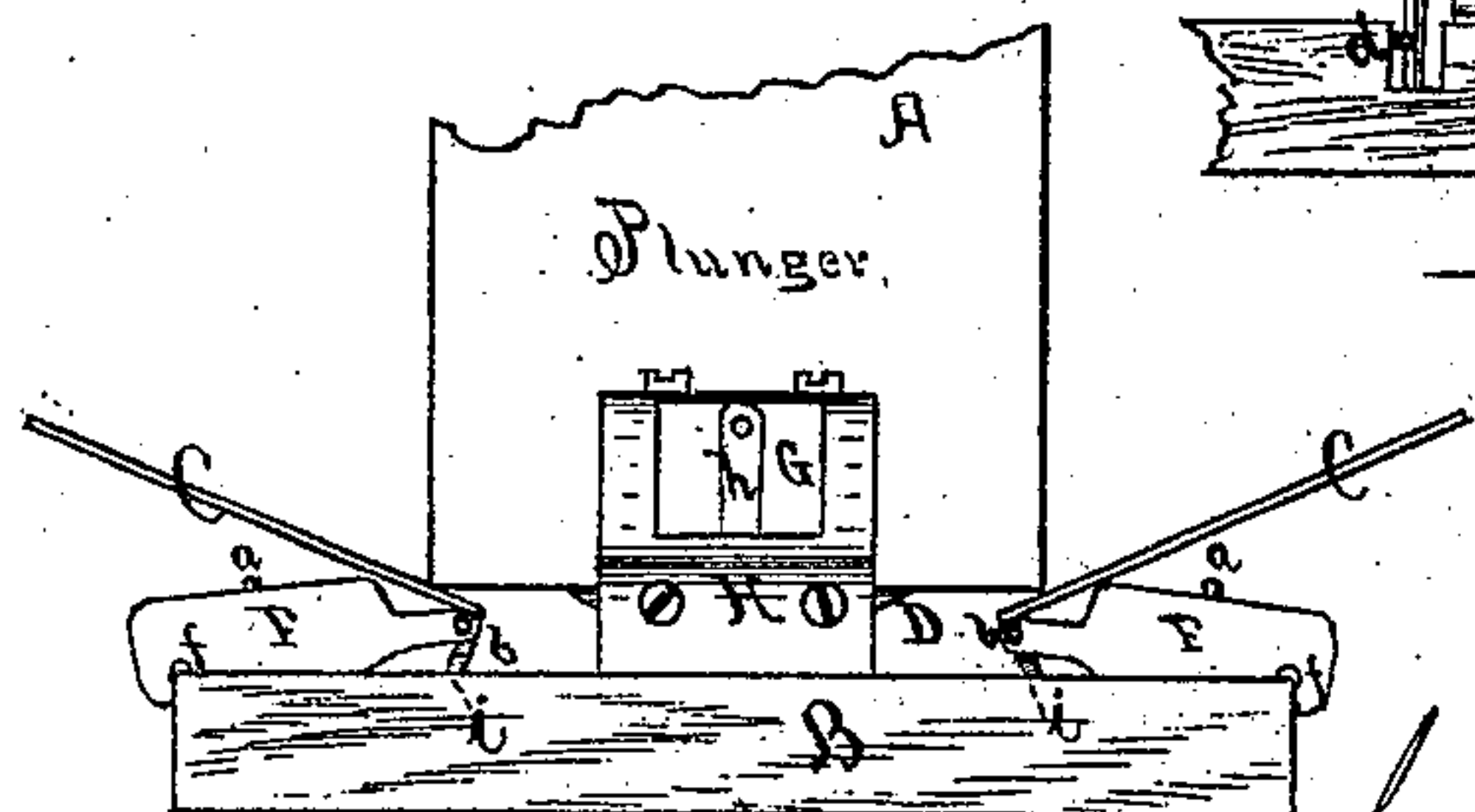
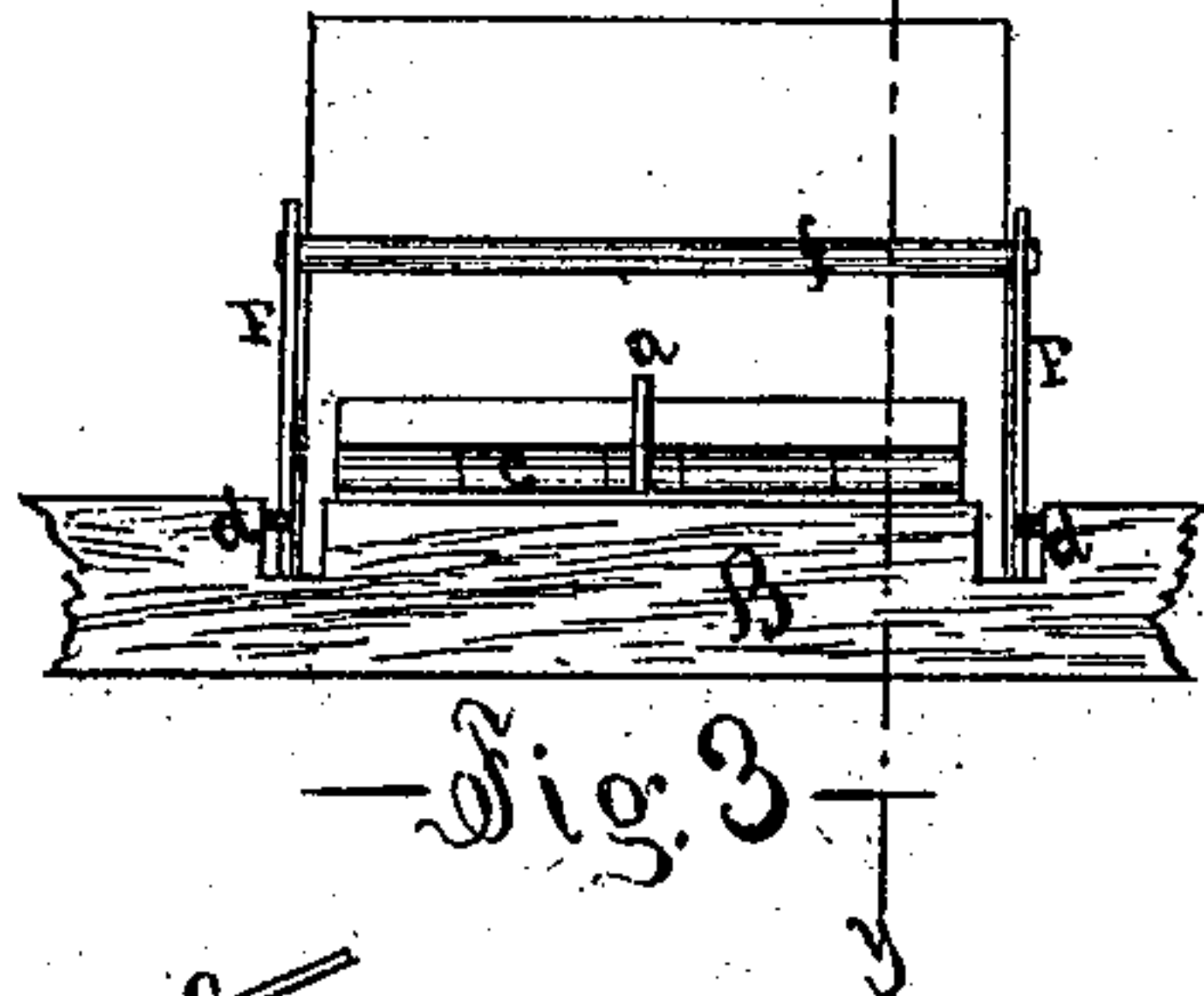


Charles A. Maxfield  
 Improvement in  
 Paper-box and Envelope Machines.



Chas. A. Maxfield  
 Inventor.



Attest  
 Edward C. Osborn  
 Witness



# UNITED STATES PATENT OFFICE.

CHARLES A. MAXFIELD, OF NEW YORK, N. Y.

## IMPROVEMENT IN PAPER-BOX MACHINES.

Specification forming part of Letters Patent No. 119,631, dated October 3, 1871.

*To all whom it may concern:*

Be it known that I, CHARLES A. MAXFIELD, of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Making Paper Boxes and Envelopes, of which the following is a specification:

My invention relates to that class of machinery used in the manufacture of boxes, envelopes, &c., and more particularly to that part of the machine by which the flaps of the blanks are turned and folded. Its object is to perfect the folding mechanism so that the flaps will be turned and folded in a better manner and more rapidly than has heretofore been done, and with less liability to injure and waste the blanks. This invention, which will be fully described herein, was made the subject of a caveat filed by me on the 9th day of September, 1870.

Figure 1 is a top view of a portion of the frame of a box-machine with the plunger removed, showing the arrangement of the folding mechanism. Fig. 2 is a vertical section through the plunger and the folding mechanism in the line *x x*, Fig. 1. Fig. 3 is a back view of one of the folding-plates C. Fig. 4 is a view of the plunger and the folding-plates taken from the right-hand end of Fig. 1, and showing the action of the plunger upon the folding-plates while descending to fold the blank. Fig. 5 is a similar view, representing the plunger after it has descended through the folding mechanism. Fig. 6 is a sectional view of one of the folding-plates taken through the line *y y*. Fig. 7 is a front view of the folding-plate of which Fig. 3 is a back view, showing the springs *i i*.

The folding apparatus is arranged around the opening in the frame B immediately beneath the plunger, and in such relation to it that the blank will be properly acted upon by the folding-plates as it is carried through them by the plunger. The apparatus consists principally of the folding-plates C C with their wings F F and the blades D D. The plates C C are hinged to the frame at *c*, and are held in a horizontal position to receive the blanks by the pins *a a*. Each one is provided with two folding wings, F F, hinged at *b b*, and connected together by the rod *f*, extending across the back of the plate for the purpose of insuring the simultaneous action of the wings. The blades D D are hinged at *g* to the springs H, which are secured to the brackets G,

as represented in Fig. 2. They project under the plunger and act to stretch the paper blank smoothly on the end of the plunger and prevent it "bagging." They are held in the position in Figs. 1 and 4 until the plunger in its descent forces them back, when they press against the sides of the plunger, as shown in Fig. 2, and fold the sides of the blank smoothly. When the plunger rises the hinges *g*, upon which the blades turn, allow the blades to rise with the plunger and permit the latter to pass readily between them. After the plunger has ascended they are thrown into their original position by the springs *h*. The plunger A is so arranged in such relation to the plates C C that, as it descends, it strikes against the ends of the plates and raises them into a vertical position. This is clearly shown in Figs. 4 and 5. As the plates approach the perpendicular the lower ends of the folding wings are forced against the pins *d d* in the frame, which causes the upper edges of the wings to be thrown forward and turn the flaps of the blank against the plunger. This position is shown in Fig. 5. The plunger in its descent carries the folded blank down in contact with the rollers E E, which are held in spring bearings so as to act to press the gummed edges of the blank together to complete the box or envelope. After the plunger has deposited the folded blank in the receivers which should be arranged to receive them, and has risen clear of the folders, the plates C C will drop back into their horizontal position by virtue of their own weight; or they may be assisted by a small spring, *i*, arranged upon the lower ends of the plates, which will be pressed against the side of the frame when the plates are raised to the perpendicular, and will react to throw the plates over when the plunger rises. The pins *d d* in the sides of the frame, against which the lower edges of the folding wings F F are pressed, cause the upper ends of the wings to be thrown forward positively, and insures their perfect working.

By changing the shape or size of the plunger and arranging the folding apparatus in proper relation thereto this invention can be employed to fold blanks of any required size and shape.

The necessary mechanism for gumming the blanks, presenting them to the plunger, and receiving and holding them in shape until they become dry, as well as the mechanism for operat-

ing the plunger and other parts of the machine, is not shown or described herein, as the same forms no part of this invention, which may be readily arranged to operate in connection with any proper mechanism for completing the boxes well known to persons skilled in the manufacture of this class of machinery.

I claim as my invention—

1. The folders C C and the pairs of folders F F, in combination with the plunger A, substantially in the manner described and specified.

2. The combination, with the plunger A and folders C C with their pairs of folders F F, of the spring-folders D D, constructed and operated substantially as described and specified.

3. The combination, with the plunger A, folding devices C C, F F, and D D, as described, of the rollers E E, constructed and operating substantially as described and specified.

4. The construction of the spring-arms D D so that they shall serve the twofold purpose of holding the blank smooth upon the end of the plunger to prevent the bottom of the box from "bagging" and folding the two sides of the box, substantially as described and specified.

CHAS. A. MAXFIELD.

Witnesses:

C. A. DURGIN,  
EDWARD E. OSBORN.