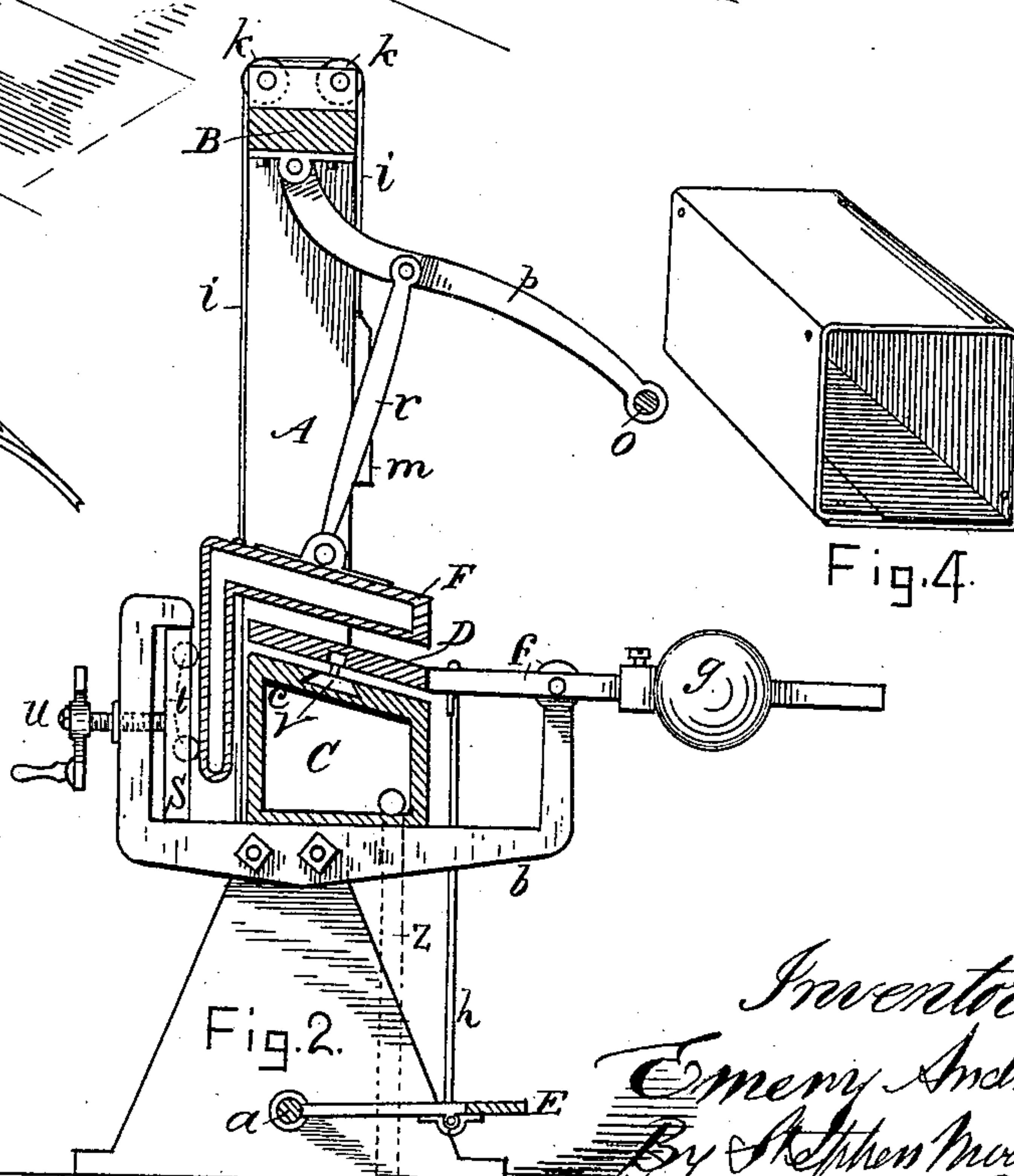
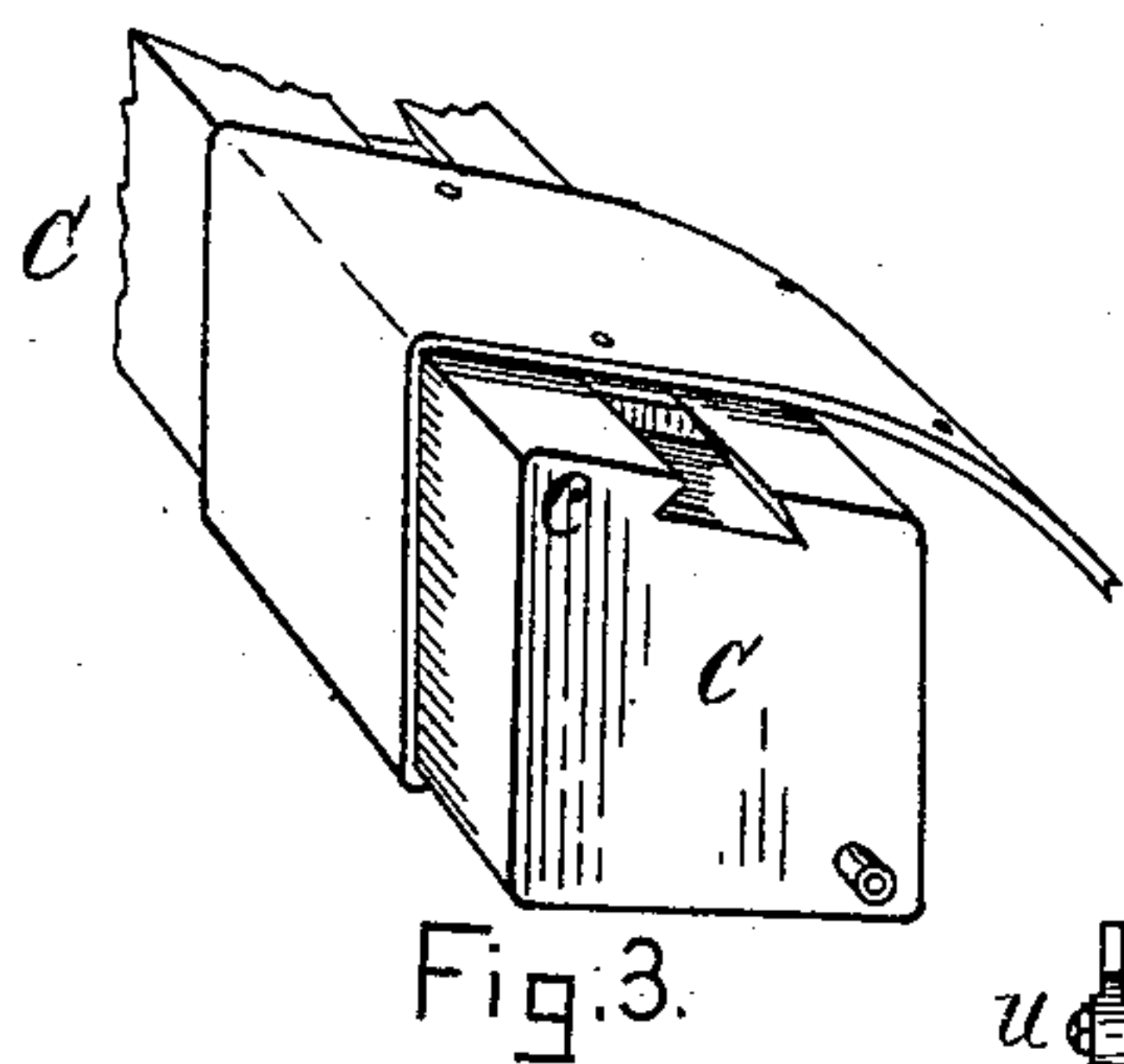
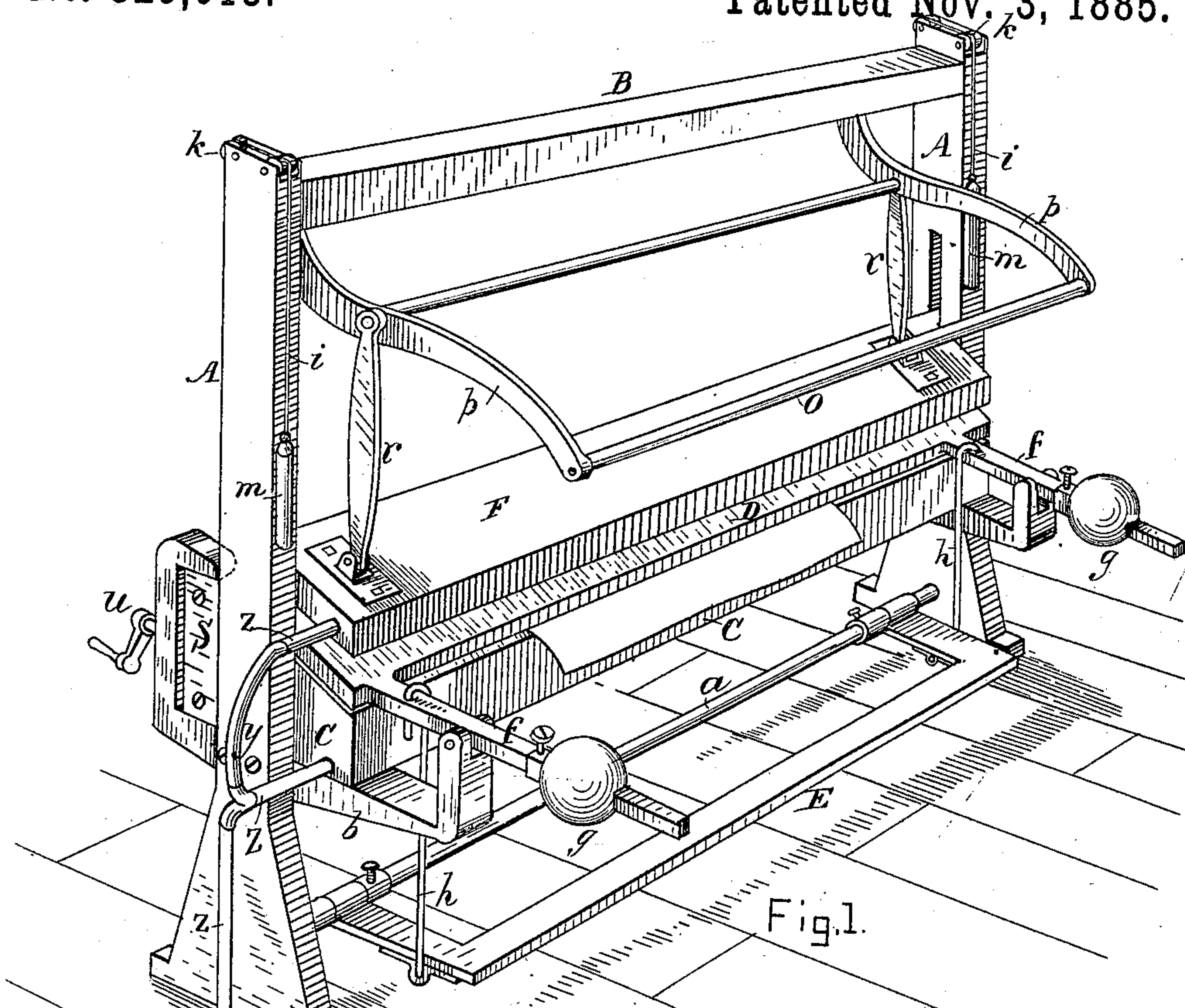


(No Model.)

E. ANDREWS.  
BENDING MACHINE.

**No. 329,613.**

Patented Nov. 3, 1885.



Witnesses  
James H Williams  
A Noble

Inventor.  
Emery Andrews  
By Stephen Moore  
Atty



# UNITED STATES PATENT OFFICE.

EMERY ANDREWS, OF KENNEBUNK, MAINE, ASSIGNOR TO THE LEATHEROID MANUFACTURING COMPANY, OF SAME PLACE.

## BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 329,613, dated November 3, 1885.

Application filed September 8, 1884. Serial No. 142,530. (No model.)

*To all whom it may concern:*

Be it known that I, EMERY ANDREWS, of Kennebunk, in the county of York and State of Maine, have invented a new and useful Improvement in Bending-Machines, of which the following is a specification.

My invention relates to that class of bending-machines which are adapted to bend sheets of material, and to heat the same while being bent, and is particularly adapted to bend sheets of parchmentized paper-board, known as "leatheroid," and similar materials which bend readily when heated and retain their new form permanently when cooled; and it consists in certain novel features of construction and arrangement of parts, which will be readily understood by reference to the drawings and the description, hereinafter set forth.

In the drawings, Figure 1 is a perspective of a machine embodying my invention; Fig. 2, a vertical cross-section of the same; Fig. 3, a detached portion of the bed-plate C of Fig. 1, and Fig. 4 a piece of material after being bent.

The frame supporting the working parts of the machine consists of two uprights, A A, connected by a cross-beam, B, at the top, and a stout rod, a, at the bottom. Between these uprights, and extending from one to the other, is a hollow bed-plate, C, supported on brackets b b, bolted to the uprights A A. One of the upper corners, c, of this bed-plate, over which the material is to be bent, is usually made at a more acute angle than that intended for the material to assume when finished, as the stock will usually spring back a little from the exact shape to which it is bent. Hence to bend material to a right angle the corner c of the bed-plate is made at an angle slightly acute, as shown. Above this bed-plate is a clamping-plate, D, attached to two arms, f f, which are pivoted to the upright portions of the brackets b b, and, extending beyond said pivots, are provided with weights g g, which may be adjusted to overbalance the weight of the plate D, so that in its normal position it is slightly raised from the bed-plate C to allow the sheet of material to be bent to be interposed; and it may be brought down upon such material by means of the foot-treadle E, which is con-

nected with the arms f f, as shown, by the rods h h. Above the clamping-plate D is suspended an angular bending-bar, F, made of such a shape as to inclose and fit the two sides of the bed-plate C adjacent to the corner c, about which the material is to be bent. This bending-bar may be made hollow, as is the bed-plate, so as to admit steam. It is suspended by ropes or chains i i, attached to either end, and passing upward over pulleys k k k k, and carrying counterbalancing-weights m m. It is adapted to be brought down upon the clamping-plate D by pulling down the horizontal rod o, attached to the extremities of the arms p p, the other ends of which are pivoted to ears on the lower side of the cross-beam B, and which have near their centers the rods r r depending, and attached to the bar F. The ends of this bar have projections which slide loosely in vertical grooves in the uprights A A, and thus guide it in its movements. The brackets b b at their ends to the left, as shown in the drawings, are each made with an upright portion so shaped as to inclose between it and the upright A, a block, S, which carries rollers which are adapted to press against the depending portion of the bar F and press it against the material interposed between it and the bed-plate C. This pressure may be regulated by screws u u, which are threaded in the upright portion of the brackets, and may be screwed against the blocks s s, as may be desired. In the upper side of the bed-plate C is a dovetailed groove, (see Fig. 3,) in which lie loosely two blocks, v v, each carrying a short vertical pin which projects above the surface of the bed-plate. The office of these pins is to enter holes punched near the edges of the material to be bent, at such distances apart on each side as equal the desired distance of the angles of the finished material. Thus, if it be desired to bend a strip of material to form four sides of a box, like that shown in Fig. 4, four holes are punched near each edge of the sheet opposite each other, and at a distance apart on each side equal to the length of the corresponding side of the box. The material is then placed on the bed-plate, so that the pins on the blocks v v will enter the two holes therein nearest to the end.



The foot of the operator depresses the treadle E, bringing down the clamping-plate D onto the stock. Then the bar *o* is pulled down, carrying the bending-bar F, the lower edge of which turns down the projecting portion of the material, the side pressure being adjusted as needed by the screws *u u*. Steam having been admitted to the bed-plate C and bending-bar F by the pipes *z z*, the heat softens the material so it may be bent without injury. The pressure upon the sheet is continued as long as may be desired, and then the bending-bar is raised and the material moved forward, so that the pins shall enter the next two opposite holes, when the operation is repeated until all the desired angles have been bent. The steam-pipe connecting with the bending-bar F should have a flexible hose-connection to accommodate the rise and fall of said bar, as shown at *y*.

I claim—

1. The combination of the hollow bed-plate C, the clamping-plate D, and the bending-bar F, arranged and to operate substantially as specified.

2. The bed-plate C, in combination with the clamping-plate D, the bending-bar F, the blocks *s s*, and adjusting-screws *u u*, substantially as set forth.

3. In a machine for bending paper-boards, a heated bed-plate, a clamping-plate adapted to hold a sheet of material thereto, and a bending-bar adapted to press upon the clamping-bar and the adjacent side of the bed-plate at the same time and by the same motion of the operating mechanism, substantially as shown and described.

4. In combination with the bed-plate C, the plate D, supported by the pivoted arms *ff* and counter-balances *g g*, and the bending-bar F, substantially as set forth.

5. In combination, the bed-plate C, the plate D, and the bar F, operated by the arms *r r* and *p p*, substantially as specified.

6. In a bending-machine, a bed-plate, C, provided with the adjustable pins *v v*, arranged to project from the face of said bed-plate beneath the bar F and to enter holes in the material to be bent, and thus determine the line along which the bending shall take place, in combination with the bending-bar F, substantially as specified.

EMERY ANDREWS.

Witnesses:

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