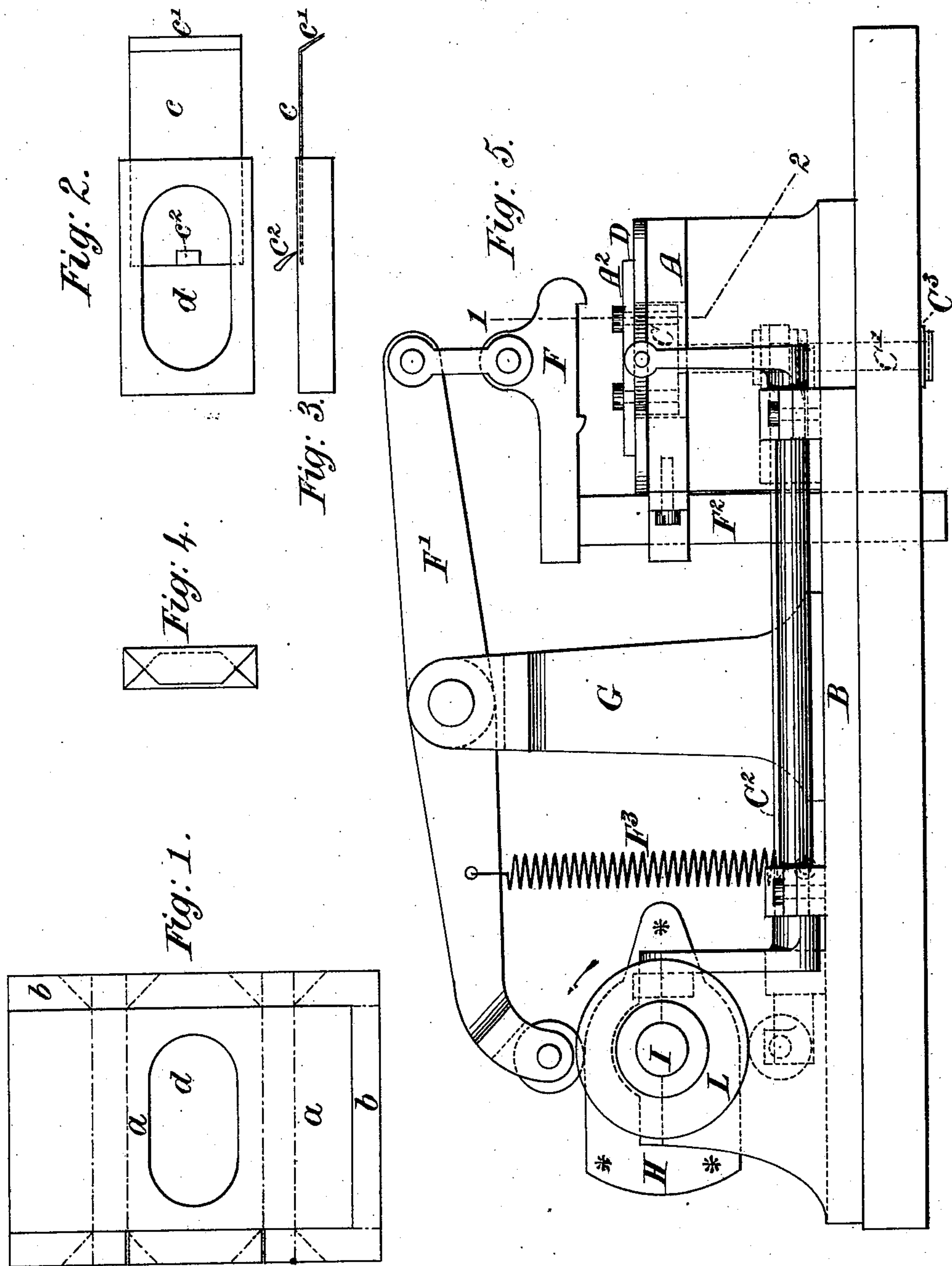


G. L. TURNEY.
Paper Box-Machine.

No. 167,807.

Patented Sept. 14, 1875.



Witnesses
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George L. Turney
By his Attorneys
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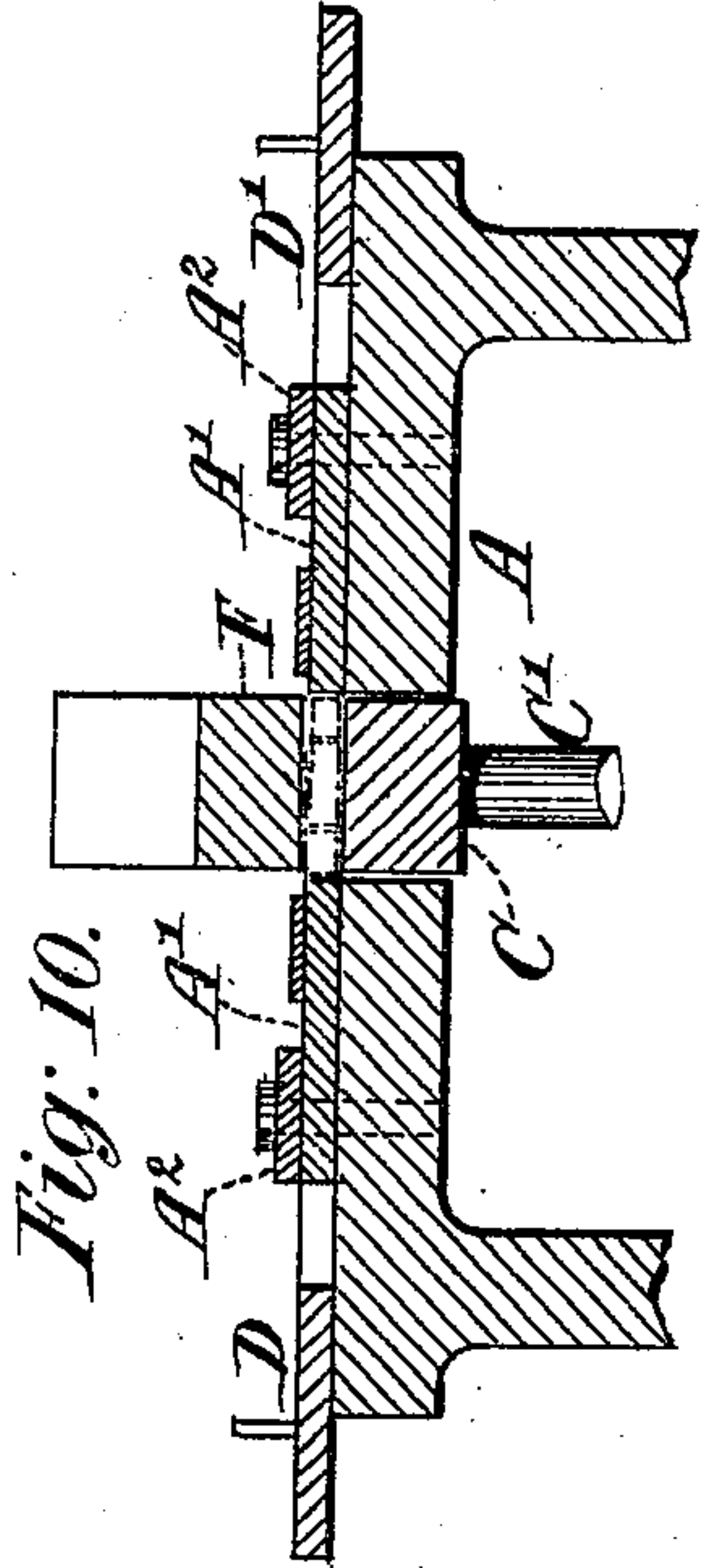


Fig. 10.

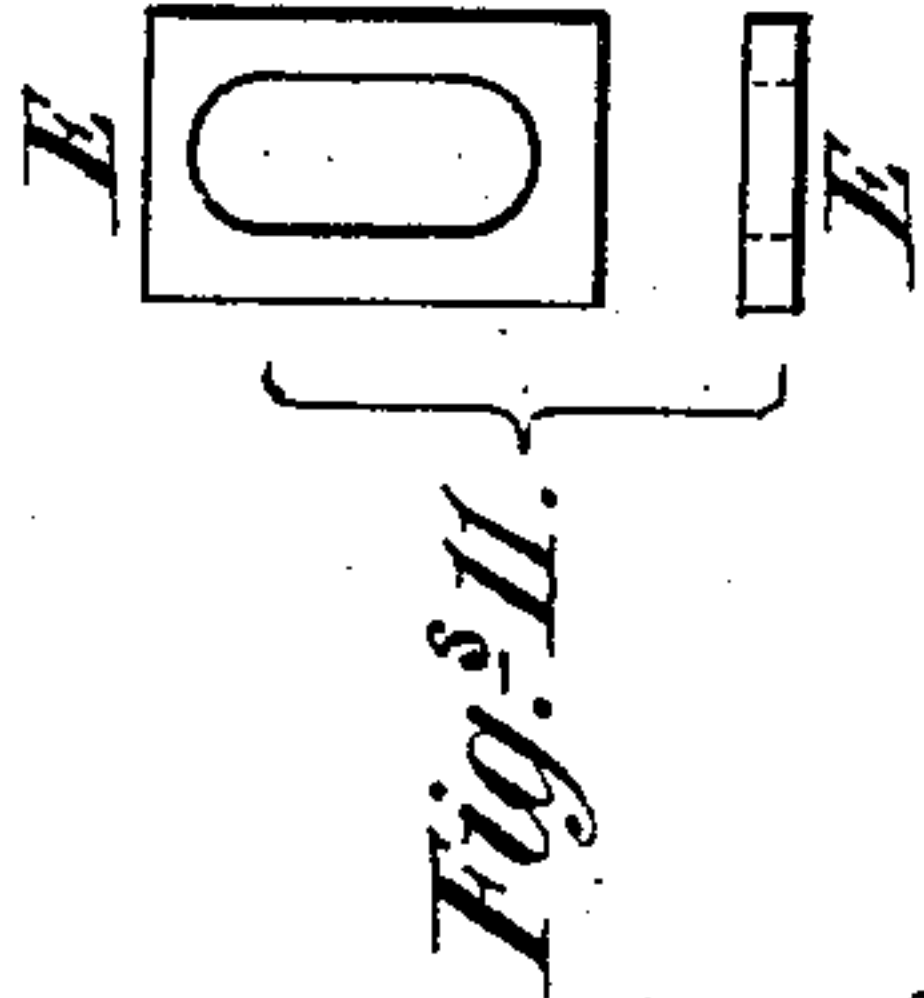


Fig. 11.

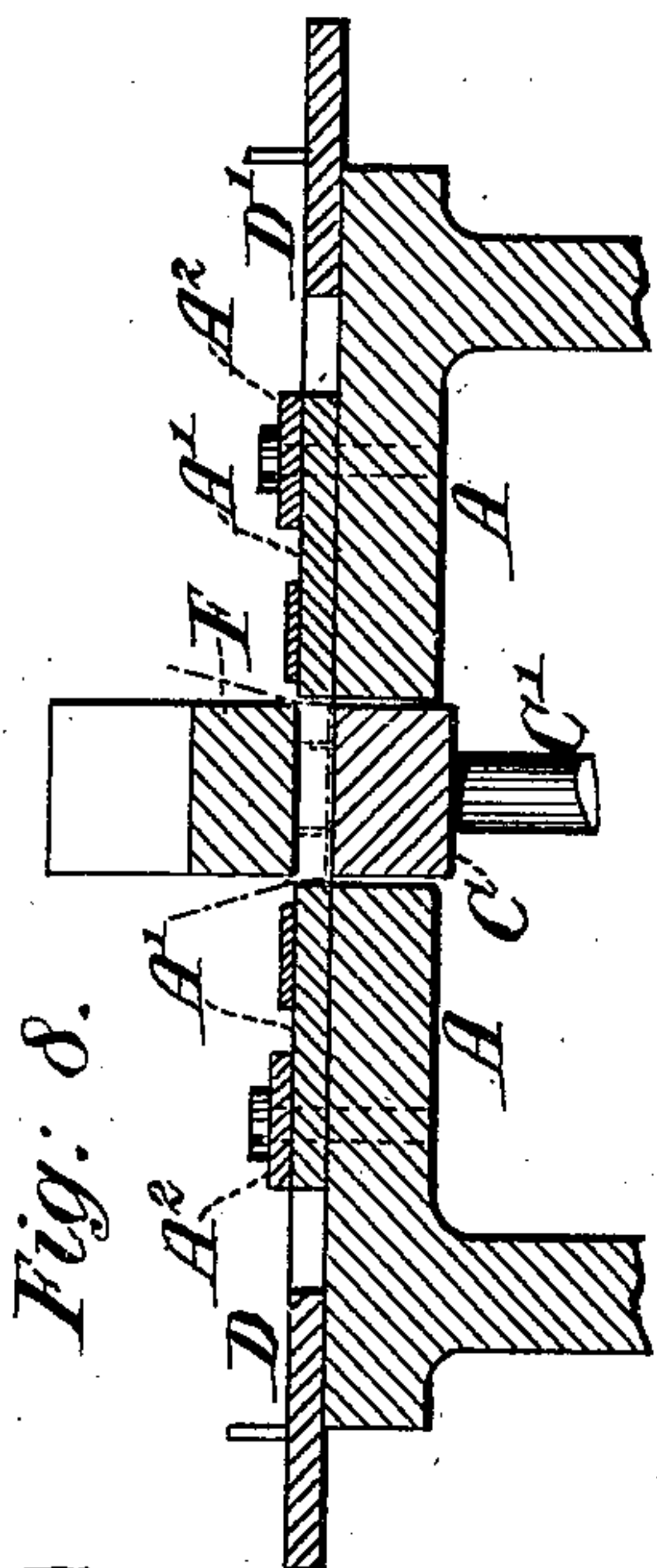


Fig. 8.

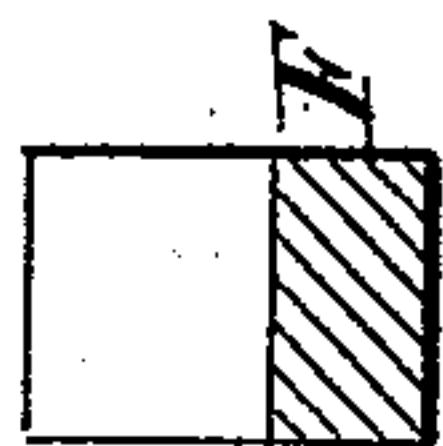


Fig. 9.

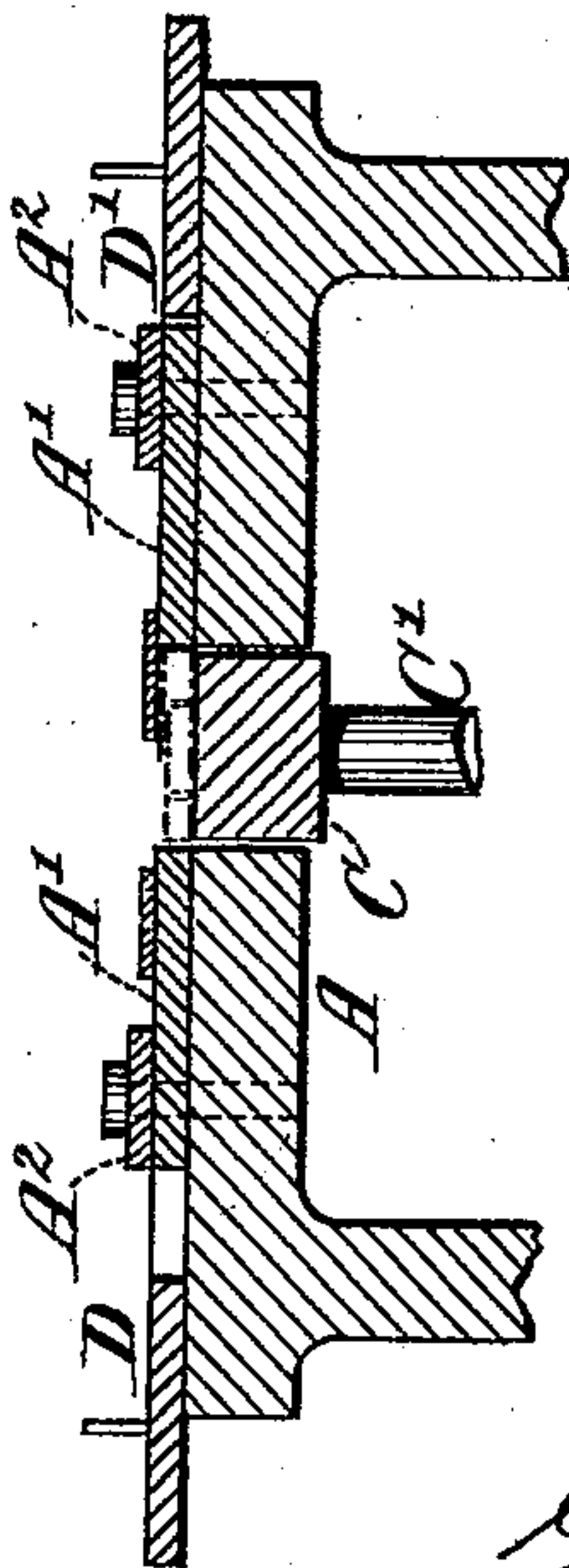
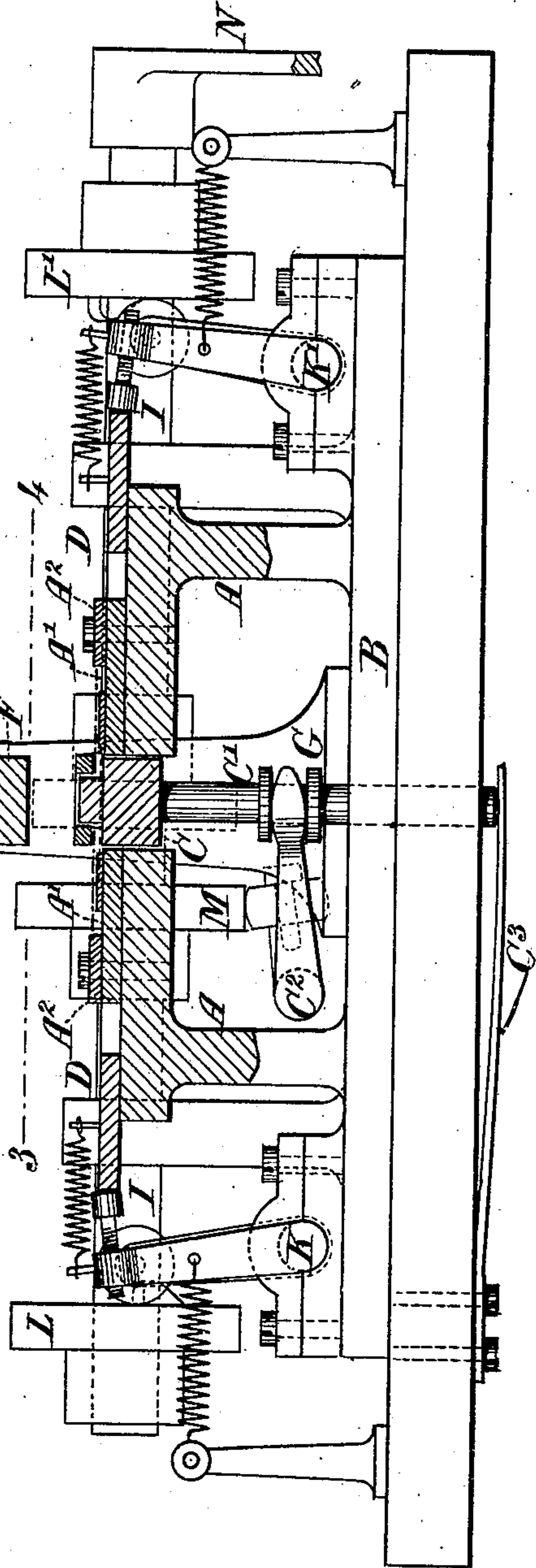


Fig. 6.



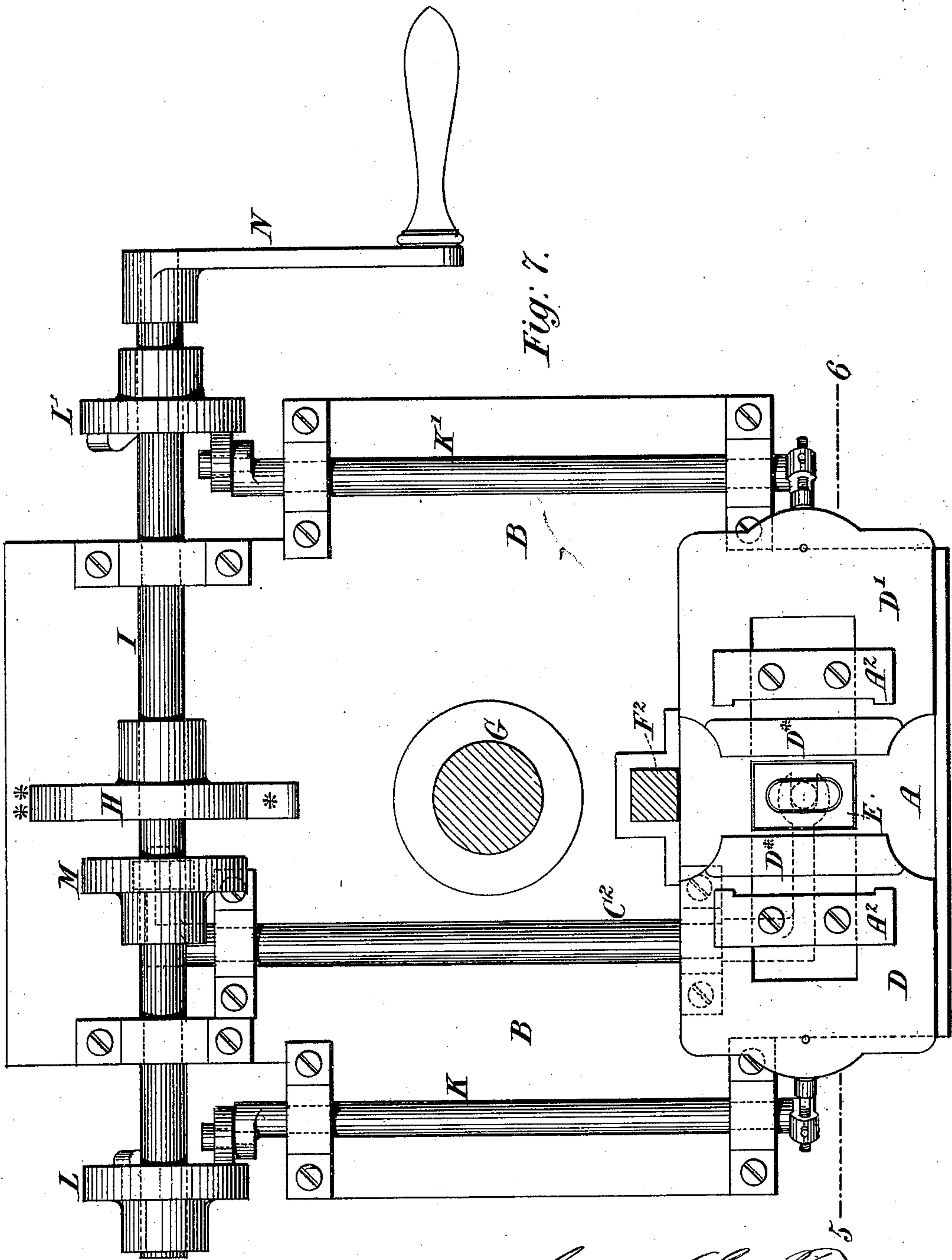
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UNITED STATES PATENT OFFICE.

GEORGE LEONARD TURNEY, OF LONDON, ENGLAND.

IMPROVEMENT IN PAPER-BOX MACHINES.

Specification forming part of Letters Patent No. **167,807**, dated September 14, 1875; application filed February 4, 1875.

To all whom it may concern:

Be it known that I, GEORGE LEONARD TURNEY, of Addle street, in the city of London, England, have invented certain Improvements in Boxes and in machinery for manufacturing the same, of which the following is a specification:

This invention relates, first, to a novel construction of box applicable to the packing of small wares for the market.

The invention is intended to combine, as far as possible, the cheapness of a paper envelope with the advantages of a box with sliding and self-securing lid, and thereby giving access to the goods which it contains, to allow of the withdrawal of a specimen, and permitting of the facile closing of the box.

The material of which I prefer to form the box is paper, as that may be readily operated upon by the machine forming the second head of my invention.

In making boxes according to the first head of my invention, I use, by preference, two qualities of paper—thick paper or pasteboard, which will constitute the lining of the box and give to it the required stiffness, and thinner covering-paper, either plain or ornamental, glazed or unglazed, which will constitute the exterior of the box. The lining-paper I cut to a length sufficient to form, when folded, the top, bottom, and sides, and allow for a lap of the folded-over edges, and of a width equal to the length of the box, with a projection at the side made by attaching thereto a piece of covering-paper, to form one end of the box. The covering-paper I cut to a somewhat greater length, and of a width suitable for folding in to form the ends of the box, notching out a portion at one side, corresponding to the lateral-projecting piece attached to the lining-paper. The lining-paper I secure at one end, by paste or otherwise, to the inner face of the covering-paper, and before submitting the paper, thus prepared, to the creasing and folding machine, I cut out an oval or other shaped hole through both thicknesses of paper at the part corresponding to the top of the box. The blanks thus prepared I feed singly into the machine, to be presently described, whereby they are converted into boxes suitable for

receiving a sliding lid, which closes the aperture stamped in the blank.

In the accompanying drawing, Figure 1 shows the blank laid out flat, with the lines of creases indicated by dots. *a* is the lining-paper, and *b* the paper forming the covering of the box. Fig. 2 shows the completed box in plan view, the cover *c* being partially drawn out to give access, through the opening *d*, to the contents of the box. Fig. 3 is a side view, and Fig. 4 an end view, of the box. The sliding cover *c* passes between the lining *a* and the plain or ornamental covering, and it is furnished with a bent-over piece, *c*¹, as well as a tape, *c*², for opening and closing the lid. This box I manufacture by the aid of the machinery illustrated in the accompanying drawing, in describing the operation of which machinery I shall have occasion to refer more particularly to the details of construction of my improved box. Fig. 5 is a side elevation of the creasing and folding machine. Fig. 6 is a sectional elevation of the same, taken in the line 1 2 of Fig. 5; and Fig. 7 is a sectional plan view, taken in the line 3 4 of Fig. 6. Figs. 8, 9, and 10 are sections taken in the line 5 6 of Fig. 7, and illustrating the action of the creasing and folding instruments.

A A is the creasing-table, supported on the bed B of the machine. In this table a rectangular opening is made, corresponding in size to the length and breadth of the boxes to be manufactured, and in this opening—which may be called the creasing-box—plays a rectangular piston, C, the stem C¹ of which is embraced by the forked termination of a horizontal rock-shaft, C², which is cranked at its opposite ends. A spring, C³, made fast to the bed of the machine, presses on the bottom of the stem C¹, and serves to maintain the piston in the position shown at Fig. 6. On either side of the rectangular opening in the table A is mounted a pair of slides, D D', carrying thin steel blades D*, which are intended to act as folders. The slides D embrace guides A¹ made fast to the table to retain the slides in position. They are overlapped by transverse stop-plates A², which are also made fast to the table. Standing up from the face of the rectangular piston is a

projection which serves as a guide for the insertion of the blank in the machine. The stop-plates A^2 also serve the same purpose. This projection, is, however, intended mainly to receive the hollow metal former E, (shown detached at Fig. 11,) which is placed over the blank. The thickness of this former corresponds with the depth required for the box, and its shape in plan corresponds with the opening made in the table, but its size is somewhat reduced to allow of the blank, when folded over the former, passing down with it into the creasing-box.

Above the creasing-box is mounted a pressing-plate, F, which is ribbed on its face, (see Fig. 5,) and is intended to force down the paper blank into the creasing-box, and after the paper has been folded over, to fold in the ends of the box. The plate F is connected by a pendent link to a rock-lever, F^1 , the fulcrum of which is carried by a standard, G, made fast to the bed of the machine. The plate F is fitted with a guide-rod, F^2 , which works in fixed guides and serves to maintain the parallelism of the plate F. The rock-lever F^1 carries at its rear end a bowl, which, by means of a tension-spring, F^3 , is held in contact with a double-action cam, H, keyed to a cam-shaft, I. This cam H is provided with two projections, one of which, marked *, is intended so to rock the lever F^1 as to give a momentary depression to the pressing-plate F. The projection **, when it comes round to the bowl of the rock-lever F^1 , will depress the plate F and retain it in its depressed position for nearly a quarter of its rotation with the cam-shaft. The object of these movements of the pressing-plate will be presently more particularly referred to.

In order to give motion to the slides D D' they are connected by springs to their respective rock-shafts K K', which shafts are formed with crank-arms at their opposite ends, as shown best at Fig. 5. The crank-arms, which are elastically connected with the slides, carry adjustable tappets, which are intended to strike the slides and thrust them forward so that their blades may fold the paper blank over the former E, and the crank-arms at the opposite ends of the shafts K K' are fitted with bowls which are acted upon by cams L L' to rock the shafts in their bearing. The bowls of these crank-arms are held in contact with their respective cams by means of the springs L^* , Fig. 6, and as the cam-projections come into action, the shafts K K' will be rocked in their bearings. On the shaft I is mounted a cam, M, which acts upon a bowl carried by cranked arms at the rear end of the rock-shaft C^2 . The rotation of this cam serves to depress the piston C, and with it the former E, and to retain the same in the depressed position while the folding of the blank is being effected. The cam-shaft I is worked by a winch-handle, N, and as all the cams are on this shaft, it will be readily understood that, when they are once

properly set relatively to each other, they will so act as properly to time the operations of the creasing and folding instruments.

Supposing the machine to be in the position shown at Figs. 5, 6, and 7, that is, with the plunger raised above the creasing-box, and a paper blank to be placed in the machine and overlaid by the former E, as shown at Figs. 6 and 7, the attendant will, by turning the winch-handle, bring the part * of the cam H into action, and cause it to give the plate F a momentary depression, and thereby force down the former into the creasing-box, the piston C being at the time free to yield to the pressure of the plate F. This depression of the former will cause the ends and edges of the blank to turn upward, as indicated at Fig. 8, and the plate F instantly rising, the folders D D' will be ready to come into action. Before, however, this takes place, it will be necessary to secure the piston C in the position which it has taken. This is effected by the cam M coming into action and depressing the bowl of the rock-shaft C^2 . The forked end of this rock-shaft will thus hold down the piston against the upward pressure of the spring C^3 , and retain it in that position until the folding is completed. As the cam L is set in advance of the cam L', the shaft K will be first rocked and caused to thrust forward the slide D, the blade of which, striking against the upraised paper, will turn it over and lay it flat upon the former. This being done, the slide will instantly return to its former position, as shown at Fig. 9, and the slide D' advancing, (under the action of the cam L' and the rock-shaft K',) will strike upon the upraised paper at the opposite side of the creasing-box and fold it down flat upon the former. As this slide retires, the part ** of the cam H will come into action, and the plate F will be again depressed, as shown at Fig. 10, to complete the folding of the blank. The projections on the under face of the plate will now crease and fold down the overlapping end pieces of the box, and the piston being at this time free from the depressing action of the cam M, the folded blank will be compressed between the two pressing surfaces. As the plate F rises the piston will rise again to the position shown at Fig. 6, and will throw up the folded blank out of the creasing-box, and the blank with the former contained therein being removed from the machine, the above-described folding and creasing operations may be repeated on a fresh blank. It only now remains to remove the block or former E from the paper box, and to secure the folded parts of the box by gum or otherwise. The gumming may, as in the manufacture of envelopes, be effected by hand. The box is now ready to receive the sliding lid c, of pasteboard or other material, for closing the oval or other opening cut out of the paper, it being inserted, as before explained, between the lining and the covering, which together form a suitable open-ended guide for its reception.

Having now set forth the nature of my invention, and explained the manner of carrying the same into effect, I wish it to be understood that I claim—

1. The novel construction of box above described, consisting of a creased and folded blank composed of a lining-paper and a covering-paper, with an oval or other shaped hole cut therein to give access to the interior of the box, such lining and covering papers being so arranged as to form guides for the reception of a sliding lid for closing the box.

2. The combination, in a machine for manu-

facturing boxes from paper blanks prepared as described, of the creasing-table A, the rectangular piston C, with its projection for receiving the blank, and the former E, the pressing-plate F, and the alternately-reciprocating slides D D', substantially as and for the purpose above set forth.

Dated the 16th day of December, 1874.

G. L. TURNEY.

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