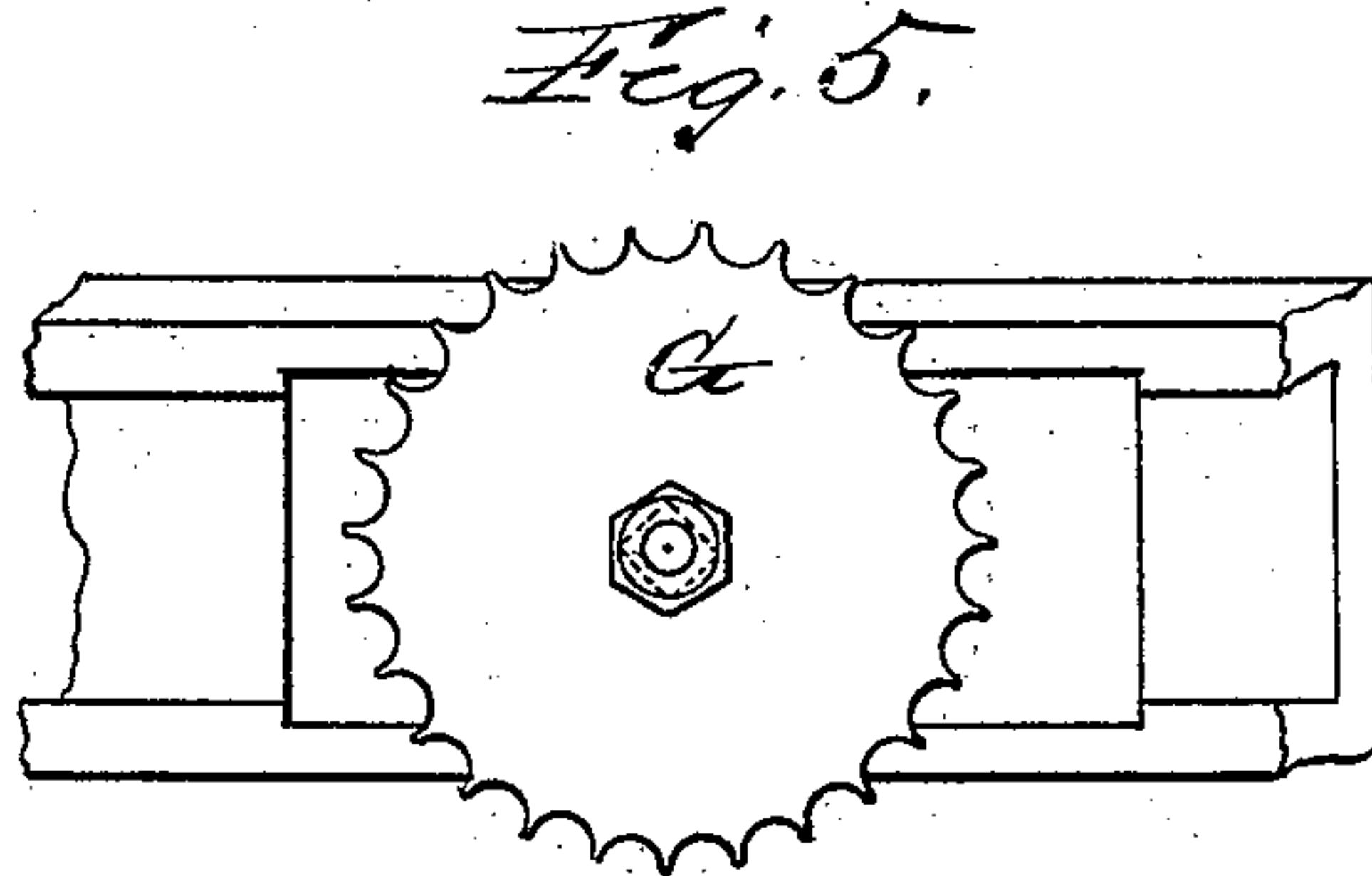
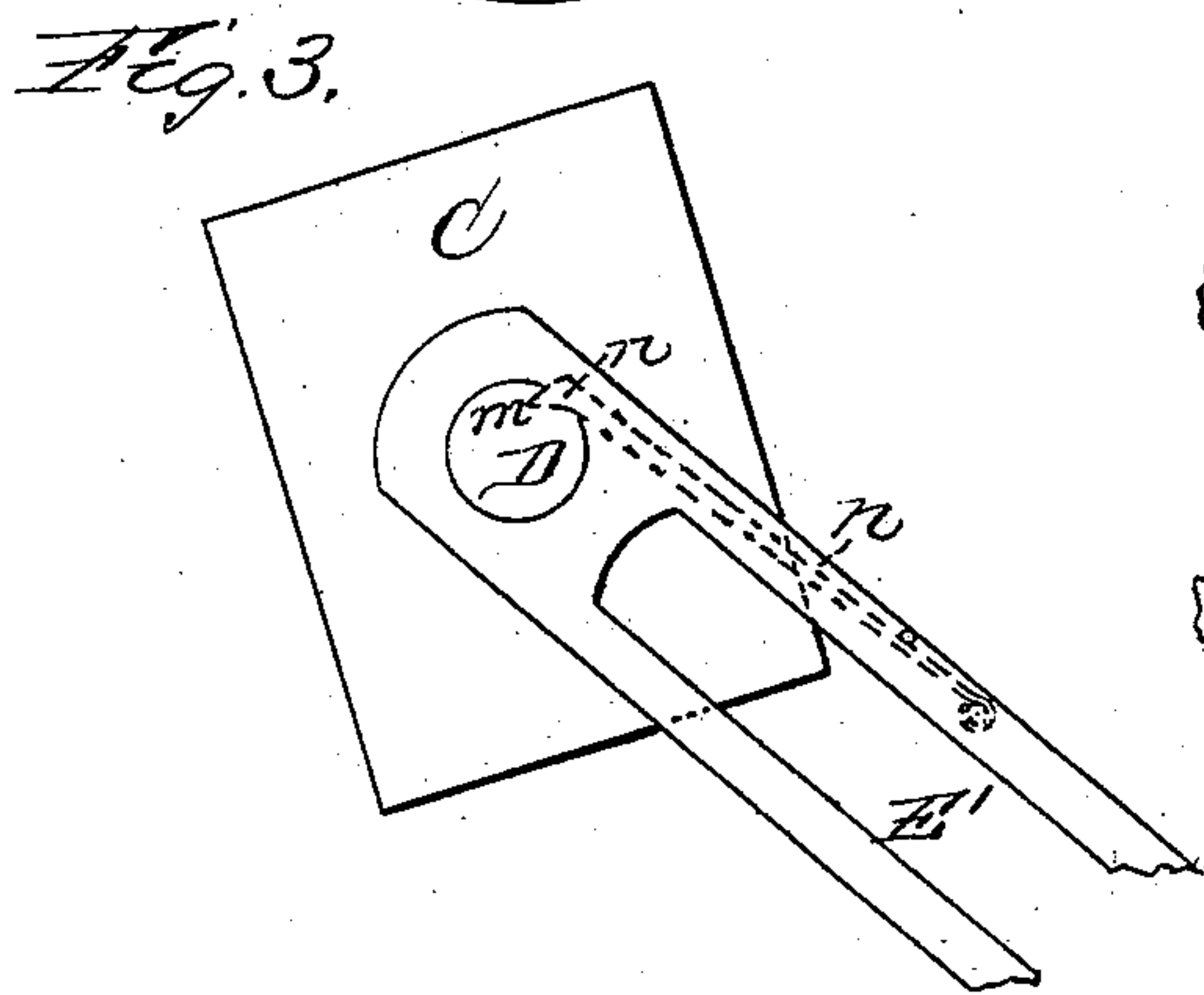
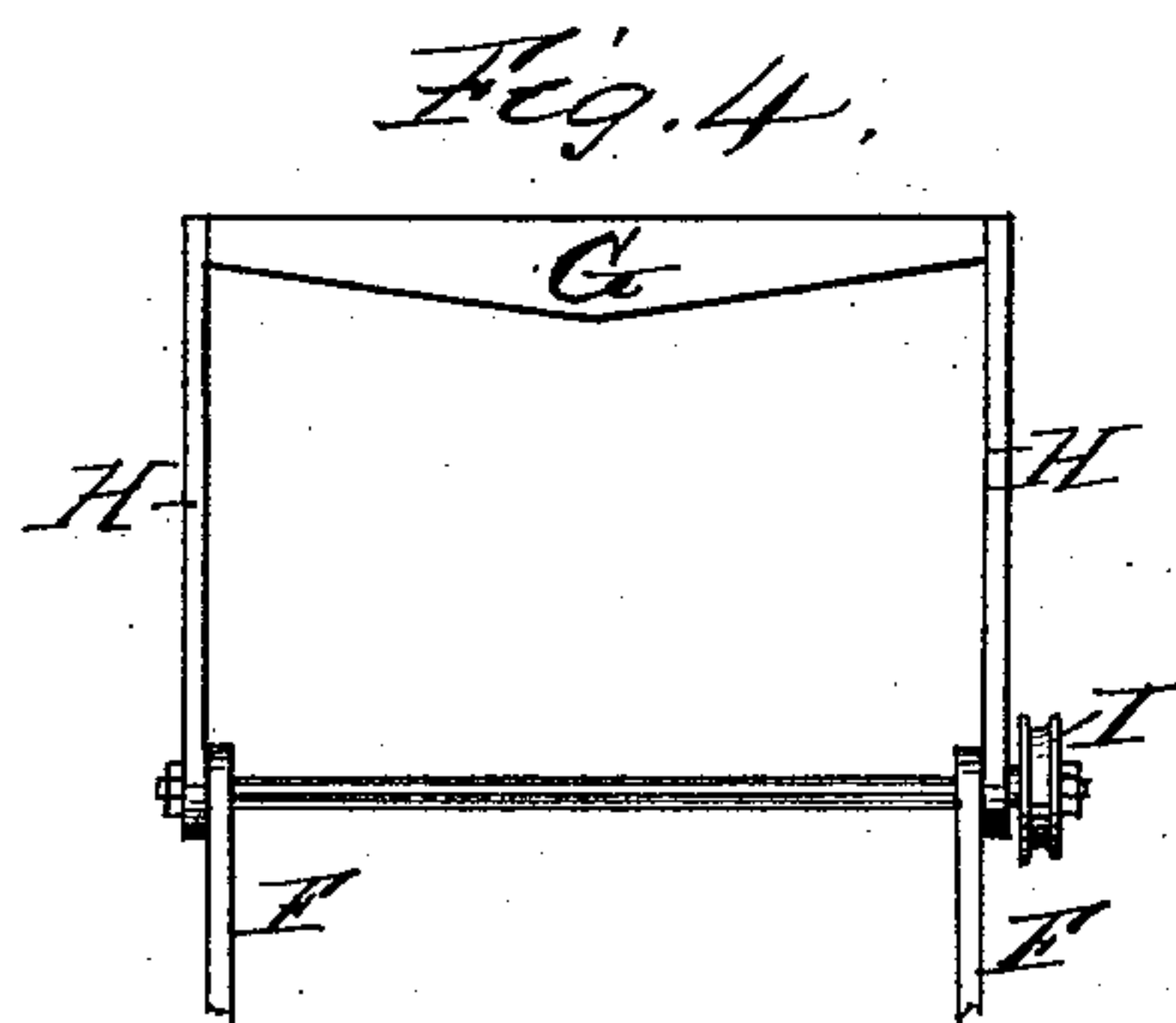
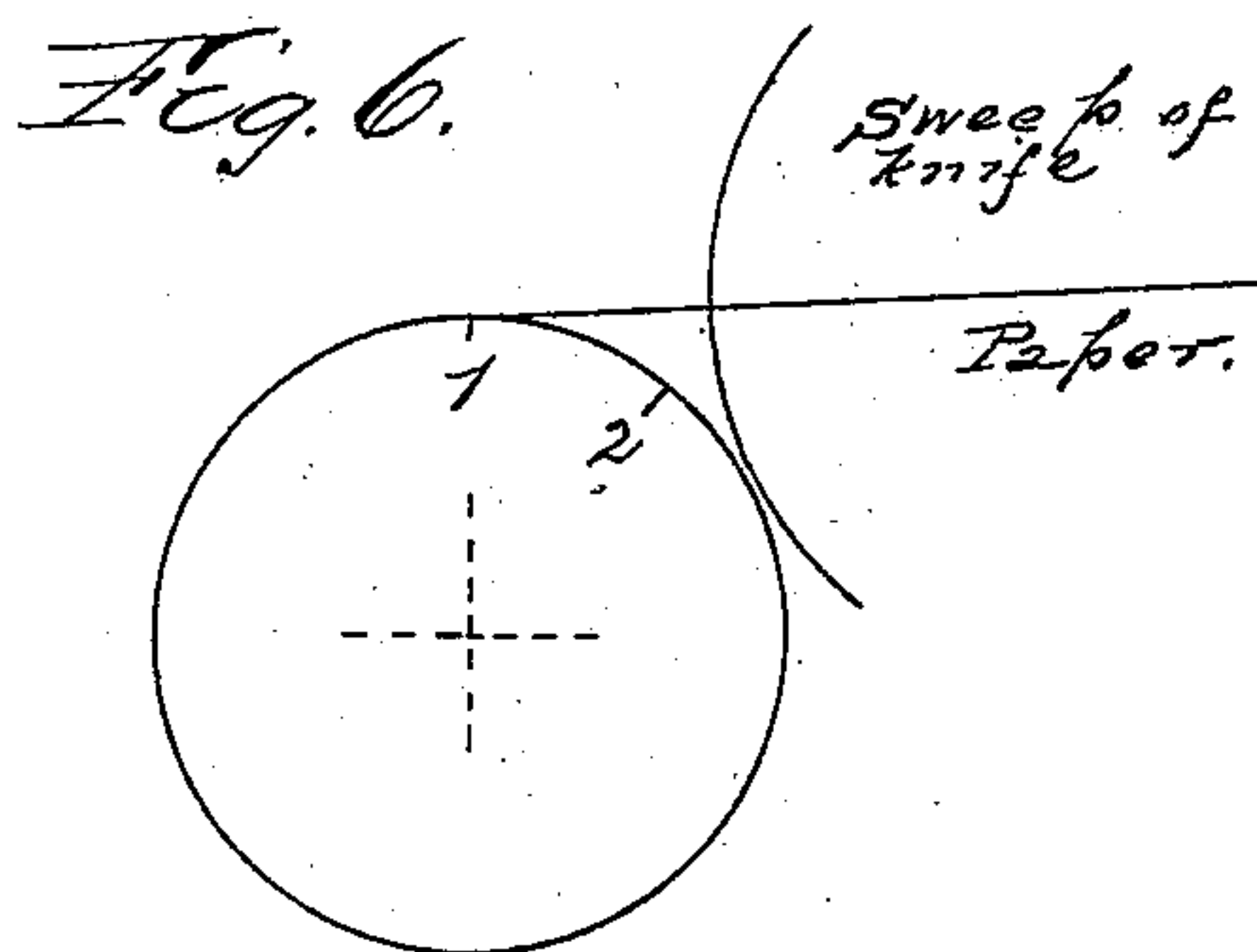
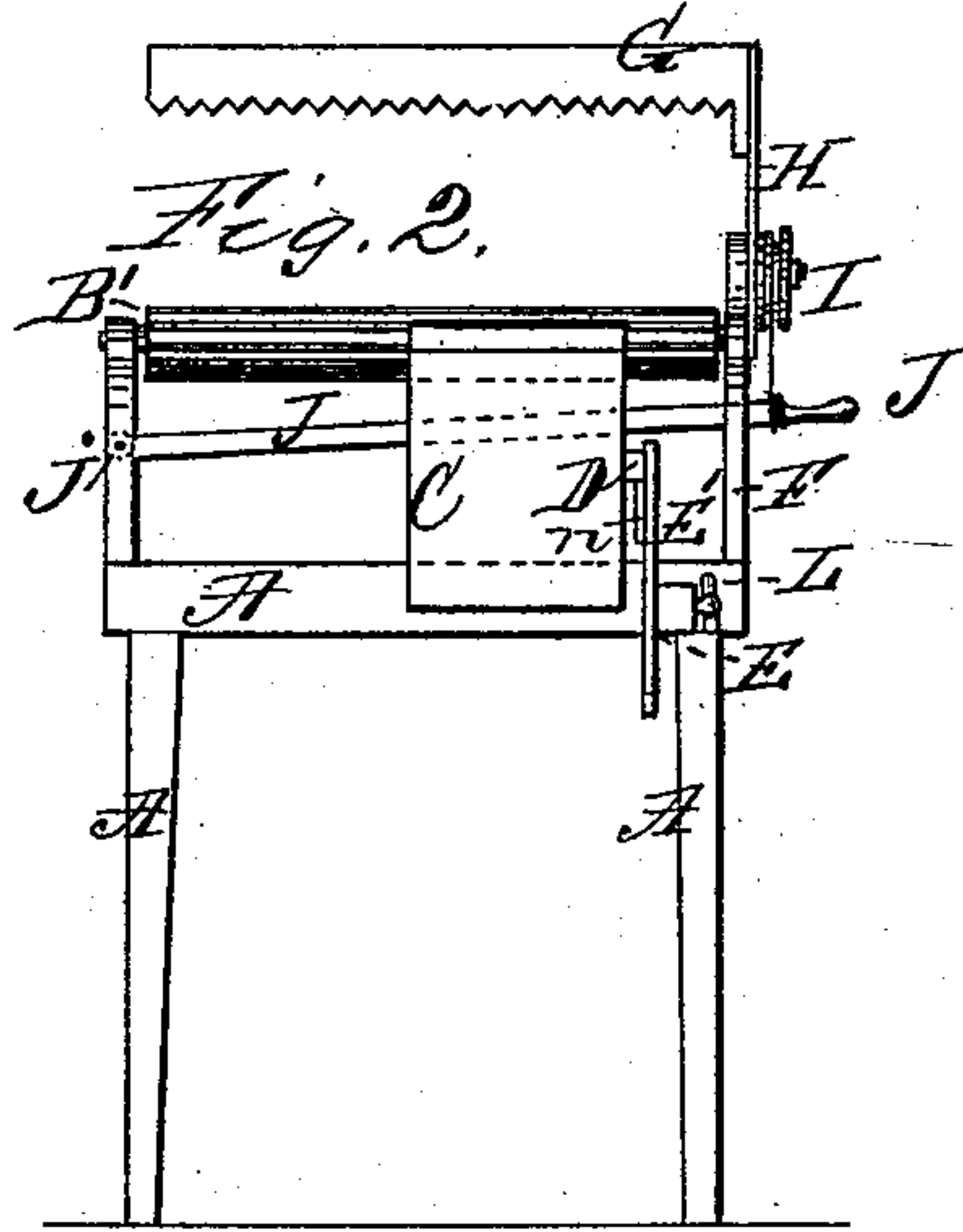
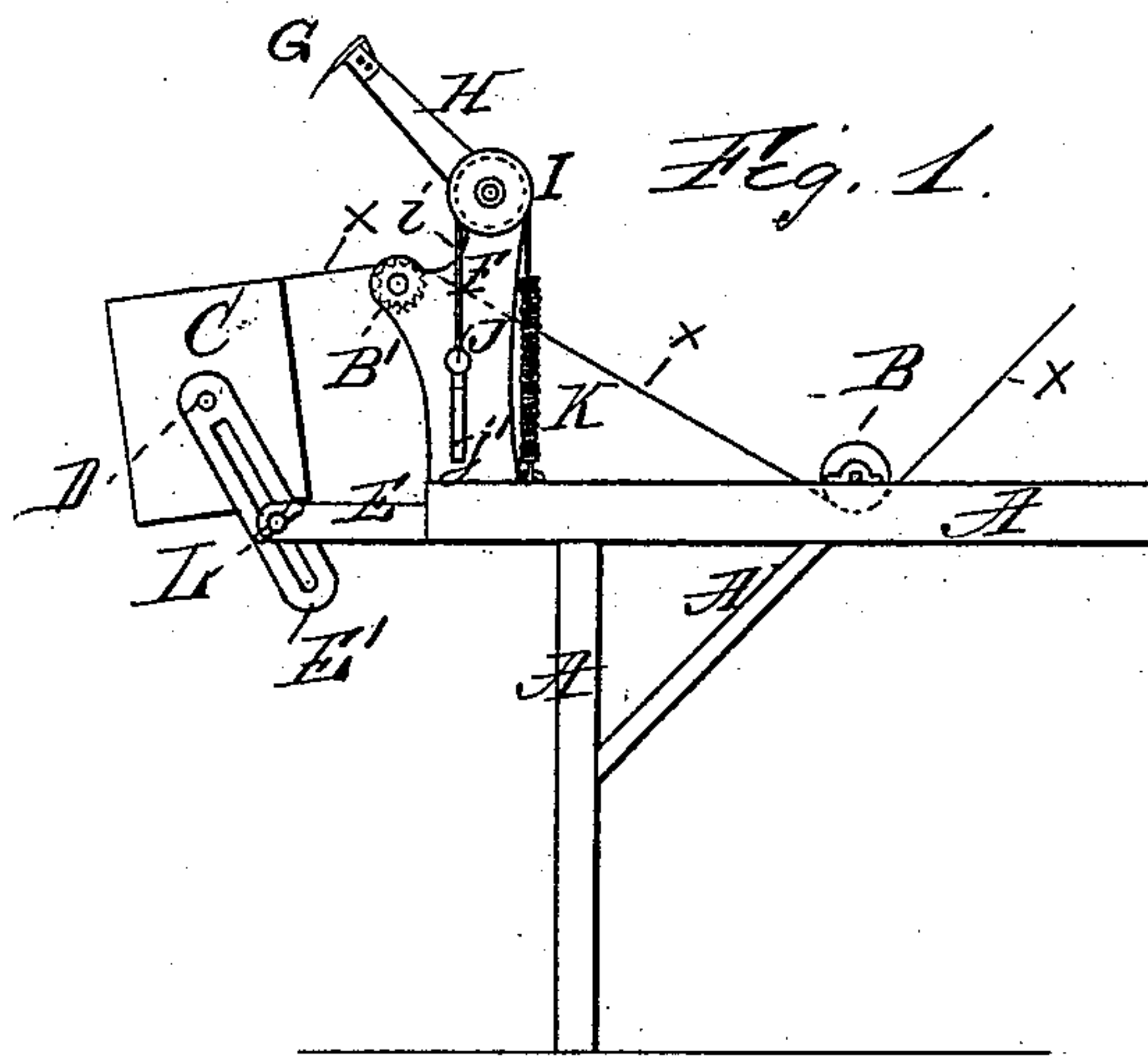


(No Model.)

P. ABBOTT.
PAPER BOX MACHINE.

No. 297,484.

Patented Apr. 22, 1884.



WITNESSES:

Walter R. Kittenden
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PHILLIPS ABBOTT, OF BROOKLYN, NEW YORK.

PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 297,484, dated April 22, 1884.

Application filed August 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, PHILLIPS ABBOTT, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Paper-Box Machines, of which the following is a specification.

My invention relates to a new and useful device for severing the paper, cloth, or other covering, or covering and trimming material used to cover paper and other boxes, and their covers, and is intended to be used on a box covering and trimming machine similar to those described in the United States Letters Patent granted to Gordon Munro, dated July 26, 1881, No. 244,919, for "improvement in box-machines," and also United States Letters Patent granted to Horace Inman for "improvement in paper-box covering and trimming machine," dated February 14, 1882, No. 253,711. I refer to these patents for a description of these machines, and therefore do not particularly describe them here. I do not, however, limit myself to the use of my invention on such machines, because it is applicable in whole or in part to many other uses. In this specification the word "box" is used to indicate box or cover.

Prior to my invention various cutters or knives have been used in machines of the class referred to sever transversely to its length the paper or other covering, or covering and trimming material after it has been coated with glue or paste, and before it is wound upon the box. But in all such cutters of which I have knowledge the moving-knife, whether in the form of a rotating disk or a blade, has co-operated with a ledger or counter blade, between which and the moving knife the strip of glue-coated material passes. Under this arrangement one or the other of the two knives or blades which make up the cutter is necessarily brought into contact with the glue-coated face of the strip to be severed, the consequence being that the paste or glue is scraped off to a certain extent, and adheres to the blade, thus gumming and fouling the cutter and interfering with its operation.

It is my object to obtain an efficient form of cutter which will not be open to the foregoing objection. I find that I can accomplish my object by making use of a single-bladed

cutter having no co-operating counter or ledger blade, and arranged to act against the unglued or unpasted face of the strip. The cutter acts intermittently and at the proper time against this face of the strip at a point intermediate between the box-form and the support from which the strip passes to said form, and it remains free from paste or glue because it never comes in contact therewith. The paper at the time it is to be severed is under tension, or stretched, between the box-form and the support from which it passes to the form, and by the action of the single-bladed cutter, brought quickly into contact with its unpasted or unglued face, is severed transversely at the proper point without gumming the cutter. The support from which the strip passes to the box-form is usually the final roller of the machine; but it will of course be understood that any other support may be employed which will preserve substantially the above-stated conditions. What is essential is that the single-bladed cutter, by which I intend and mean a cutter which has no co-operating counter or ledger blade or bar, should act against the unglued face of the strip at a point intermediate between the box form and the support from which it passes to said form, and that that portion of the strip extending between these points should be sufficiently tense or free from slack to permit the cutter to act efficiently. With a view to assuring the revolving box-form in the position it should occupy when the cutter is about to act, I combine with it a detent, which at the proper point during its revolution comes into play, and serves to maintain it in the required position relatively to the cutter. This detent may conveniently consist of a spring click or pawl adapted to engage a notch formed at the proper point in the hub or shaft of the box-form; and in order that the relation of the box-form to the cutter may be preserved notwithstanding variations in the size of boxes, I make the form adjustable both vertically to and from the cutter, so that although the size of the form may vary it can be adjusted to its proper position with respect to the cutter.

In the following figures like letters indicate like parts.

Figure 1 illustrates a side plan view of the invention. Fig. 2 illustrates a front view of

the invention with the covering, or covering and trimming material, removed. Fig. 3 illustrates the indented shaft, click, and supporting-arm for the box-form. Fig. 4 illustrates a knife with two supporting-arms and a pointed blade. Fig. 5 illustrates a circular knife. Fig. 6 illustrates the operation of the invention when round boxes are being covered or covered and trimmed.

10 A A represent the frame and legs of the machine. It may be made of any desired material and in any desired form.

15 B B' are two rollers, those nearest the box-form, under and over which the covering and trimming material passes, or the covering material alone if trimming be not used. It is not essential that the rollers B and B' should be present in the machine, but B' or its equivalent is desirable.

20 C is the box-form, which may be revolved by hand or power, as desired, on its shaft D, which passes through the end of the box-supporting arm E E'. This arm is made in two parts for the purpose of adjustment, as hereinafter explained. It may be adjustable laterally across the machine, as set forth in the said Inman patent, if desired. The roller B' is corrugated, so that the pasted side of the paper, which comes in contact with this roller, shall adhere thereto as little as may be, and these corrugations, instead of running parallel with the axis of this roller, may be applied to it in spiral form, so that there shall not be any jerking of the covering and trimming material, which sometimes takes place when the adhesive material is very strong, consequent upon its jumping, as it were, from one corrugation to the next one. The support for the roller B' is, preferably, the support for the knife also. It is seen at F. There may be separate supports, however, if desired.

45 G is the knife, the cutting-edge of which is serrated or toothed, the edges of the serrations or teeth being, preferably, sharp, so that after the points of the teeth have punctured the paper or other material it may be completely severed by a cutting in preference to a tearing action. Knife G is supported at one end by an arm, H, which is pivoted at the upper end of the support F, and concentric with the pivot a grooved wheel, I, is fastened to the arm H; over which a strap or other suitable pulling device, *i*, is passed and fastened to it near its under side. This is simply for the purpose of getting a continuing crank action, and any other suitable device may be used. The strap or its equivalent is fastened to the lever J, which is pivoted at its back end, as seen at *j*, and, preferably, for the purpose of smooth action, passes through a slot, *j'*, in the support F. A foot-treadle or a straight pull-rod, or any other suitable device, may be substituted for the lever J—anything which will give the required movement to the knife. The knife 60 may be supported by two arms instead of one, if preferred, they being preferably connected by a cross-shaft, as seen in Fig. 4.

K is a retractile spring, which is fastened at one end to any suitable part of the machine and at the other to the wheel I, or to the arm H, so that when the knife has been brought down by the lever J the spring will draw it back again into proper position for the next stroke. The knife should be made of material stiff enough to withstand the centrifugal action of the arm H when operated or braced if made of thin material.

It is desirable that the box-form should attain such a position relative to the knife that the material shall be cut as near one of the corners of the box as may be, so that but little paper will be wasted in the overlapping, and also so that the paper may be more rigidly stretched or supported, owing to the proximity of the corner of the box. I therefore make the arm which supports the box-form in two parts. One of them, E, is provided near its outer end with a strong binding thumb-screw and bolt, L, and the other part, E', has a slot cut in it lengthwise, through which the binding-bolt passes. Thus the box on the form, irrespective of its size, can be adjusted in relation to the knife so that the sweep or track of the knife will be adjacent to the corner of the box when it is operated, as hereinafter set forth. In order that there may be no danger that the stroke or pressure of the knife (especially if the covering or trimming material be cloth or like tough substance) may cause the box-form to turn backward instead of severing the material, I form on the shaft of the box-form a single indentation or tooth, as seen at *m* in Fig. 3, and into this indentation a spring-click, *n*, which is fastened to the arm E', drops at each complete revolution of the box-form. The click engages with the indentation *m*, and prevents the box-form from turning backward; also, the noise which the click makes when it drops into the depression intimates to the operator when to work the knife. The click serves another useful purpose as well—*i. e.*, it holds the box-form steady while the paper is being first applied to the next box, thus making this operation more easy and accurate. The end of the click should be so shaped relative to the indentation or tooth in the shaft that the box-form can be turned toward the operator, the click rising out of the indentation, but not in the opposite direction; also, the location of the indentation or tooth on the shaft should, preferably, be such relative to the box-form itself that it (the box-form) will be in substantially the position shown in Fig. 1 at the time the click engages with the indentation, so that the above-recited operation and relative position of the parts may be secured; and when round boxes are being covered, or covered and trimmed, the indentation or tooth should be so located that the click shall engage with it before the paper or other material has adhered to the box throughout its entire circumference—that is to say, about one-eighth of the paper necessary to go completely around the box

should be between the place where the knife cuts it and the place where it has then come in contact with the box—and the operator in applying the paper to the next box will apply it about one-eighth the entire circumference of the box nearer to him than where the overlap of the ends took place on the box he last covered. This is illustrated in Fig. 6. The operator applies the paper to a new box always, say, at the point marked 1. When the paper so applied has in the revolution of the box reached the point marked 2, the click will engage with the indentation and the knife will be operated, cutting off sufficient paper to complete the covering of that box, which is smoothed down by the hands of the operative, as usual, and the box is removed.

In Fig. 4 I show another form of knife. Instead of being straight on the cutting-edge and serrated, the edge is made smooth and sharp and in the form of an obtuse angle, the point of which will first puncture the material, and then the receding side edges will complete the severance; also, a knife such as shown in Fig. 5, being a serrated disk, as shown, which travels across the paper on suitable ways, may be used, the controlling idea in my invention being to provide a device whereby the box-covering material used on the machine stated, which must be pasted or glued on one of its sides, may be readily and quickly severed transversely of the length of the material, whenever desired, and at any point, and to so construct the devices as to accomplish the disunion of the material by means of a single severing-edge acting against the unpasted or unglued side of the material, and relying on the resistance of the material to this edge to effect its severance, and not using any counter or duplicate cutting-edge whatsoever, because, as already stated, it is the presence of such duplicate cutting-edge which creates the difficulty, because of the accumulation of paste or glue upon it.

The covering, or covering and trimming material, is shown at X.

The operation is very simple. After the covering or covering and trimming material has been wound on the box, as desired, the operator simply strikes the lever J with his hand, which, acting through the cord *i* and the grooved wheel I, brings the arm H and the knife G sharply forward, which, striking the material on its unpasted side in its descent, cuts it off. The spring K then retracts the arm and knife ready for the next occasion. If a very tough material be used to cover or trim the boxes, or if some stiffening substance—such as a cord—be run with the covering or trimming material, then it is sometimes desirable that the knife should strike with more rapidity and force than will be conveniently possible by the use of the devices shown. In this event a strong spring may be used as the power to throw the knife, it being retracted by the use of the lever J

until a point of release for the strong spring is attained, then being freed, it will forcibly act upon the knife, causing it to strike with such power as may be required depending on the strength of the spring; also, the knife may be geared to the shaft of the box-form in such manner that it will act automatically when the box-form has completed a revolution; but this I consider dangerous to the hands of the operator. I however do not disclaim my improved device when used with these attachments.

I do not limit myself to the details of construction shown, since they may be quite extensively varied and yet my invention be embodied.

Having described my invention, I claim—

1. In box covering or trimming machines, the combination, with the box-form and the support from which the glue or paste coated strip passes to said form, of a single-bladed cutter arranged and operating to act against the unglued face of the strip at a point intermediate between said box-form and support, substantially as and for the purposes hereinbefore set forth.

2. The combination, substantially as hereinbefore set forth, of the revolving box-form, the detent therefor, the support from which the glue or paste coated strip passes to the said form, and the single-bladed cutter arranged and operating to act against the unglued face of the strip at a point intermediate between said support and box-form.

3. The combination of the box-form adjustable relatively to the cutter, substantially as described, the support from which the glue or paste coated strip passes to said form, and the single-bladed cutter arranged to act against the unglued face of the strip at a point intermediate between said support and adjustable box-form, substantially as hereinbefore described.

4. The combination of the revolving box-form adjustable relatively to the cutter, substantially as described, the detent therefor, the support from which the glue or paste coated strip passes to the box-form, and a single-bladed cutter arranged and operating to act against the unglued face of the strip at a point intermediate between the said box-form and support, substantially as and for the purposes hereinbefore set forth.

5. The combination of the knife G, the arm H, the wheel I, the lever J, the cord *i*, and the spring *k*, substantially as and for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 17th day of August, A. D. 1883.

PHILLIPS ABBOTT.

Witnesses:

JOHN H. IVES,

WALTER H. CRITTENDEN.