

(No Model.)

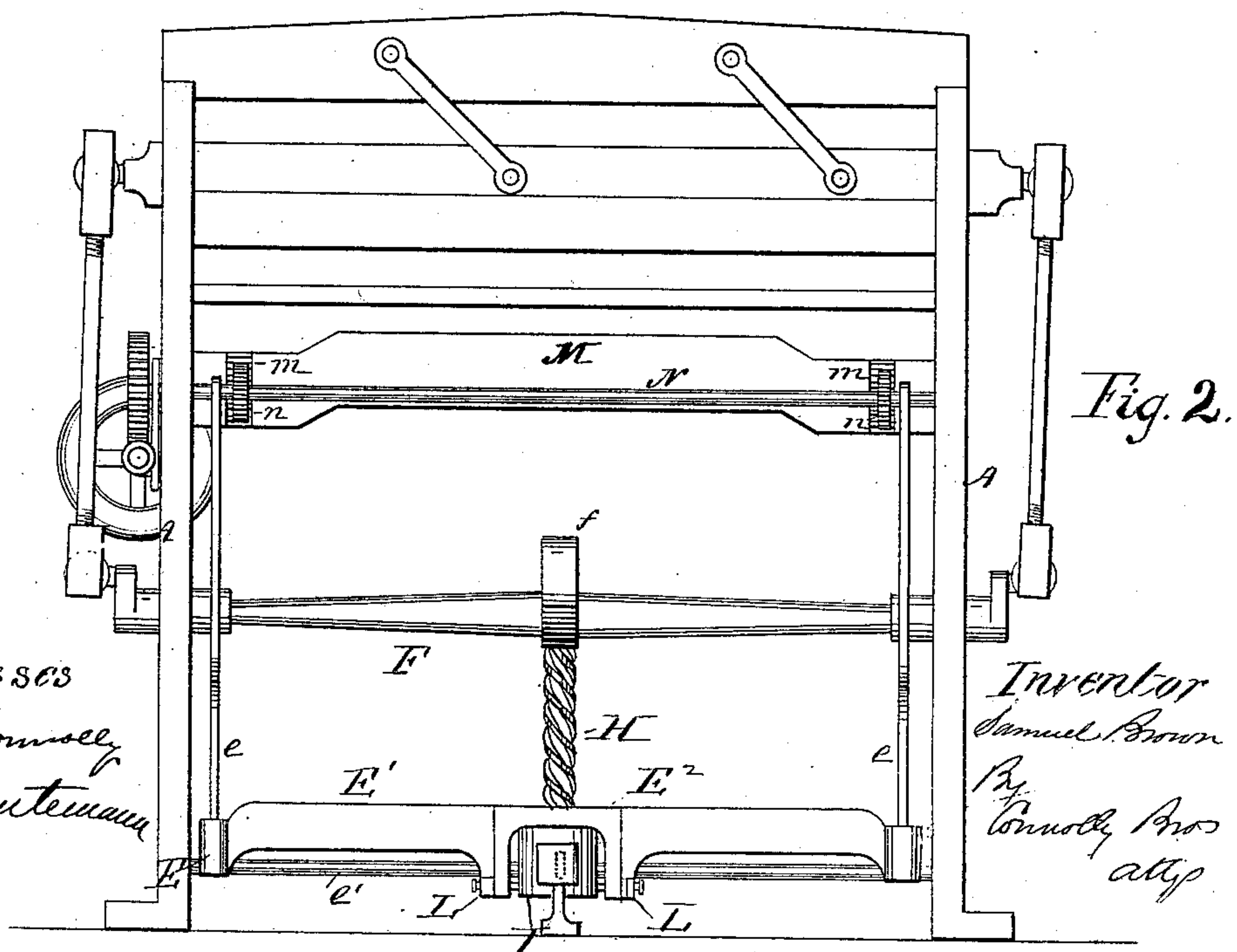
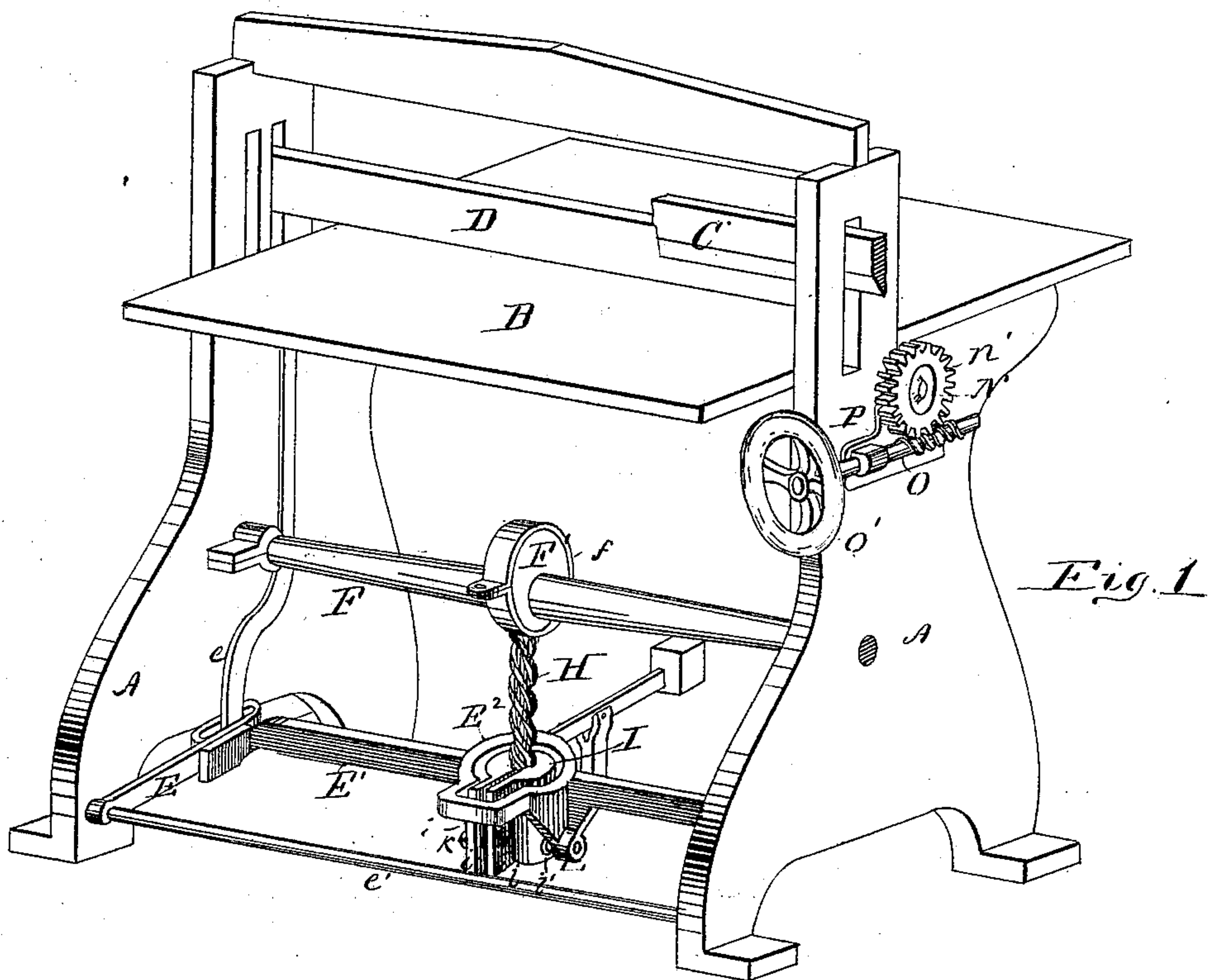
2 Sheets—Sheet 1.

S. BROWN.

PAPER CUTTING MACHINE.

No. 299,457.

Patented May 27, 1884.



Witnesses
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H. B. Huntman

Inventor
Samuel Brown
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2 Sheets—Sheet 2.

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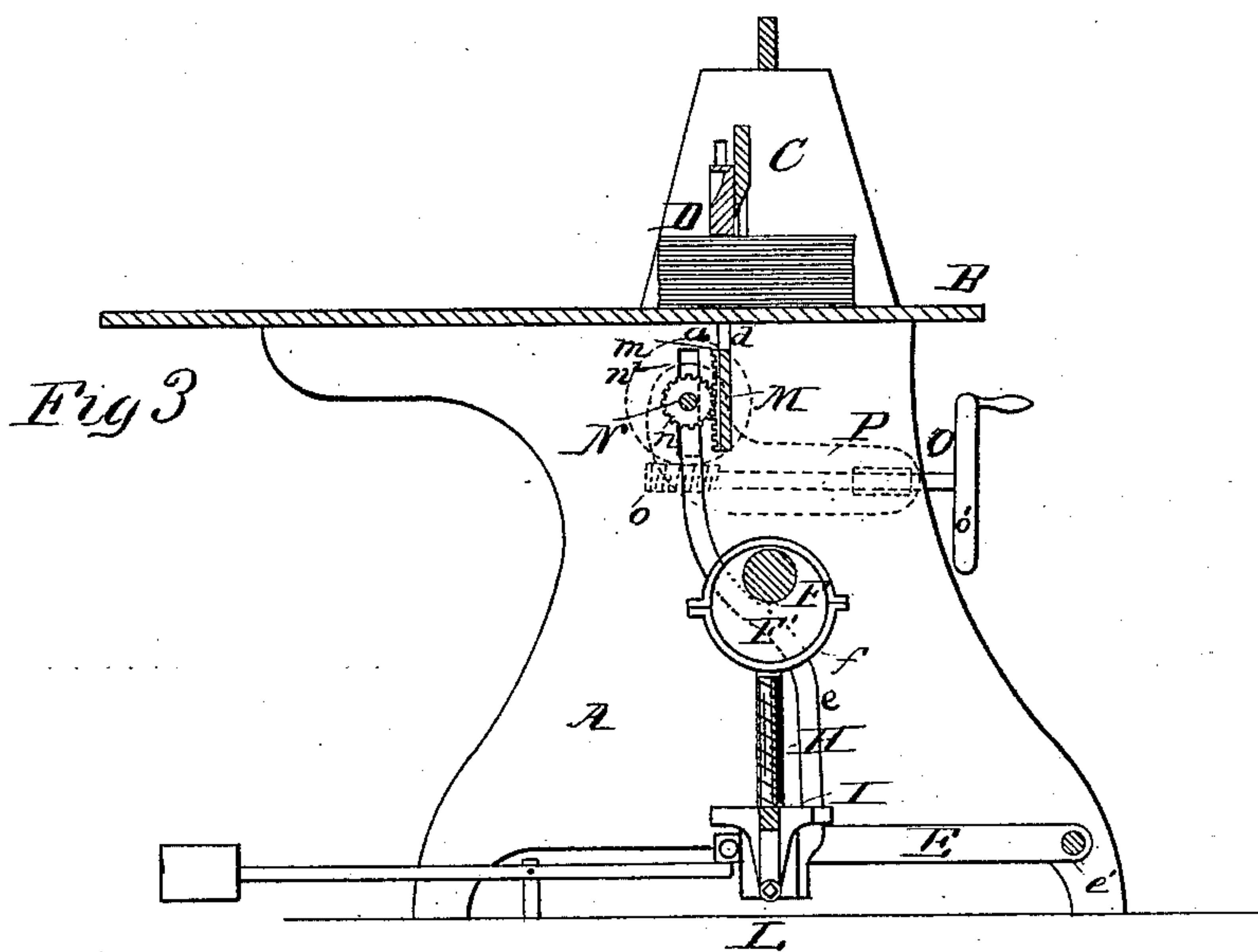


Fig. 5

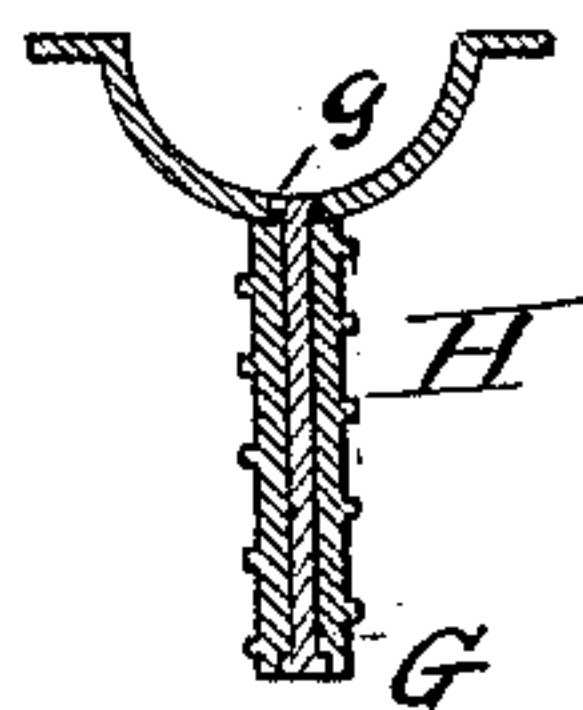
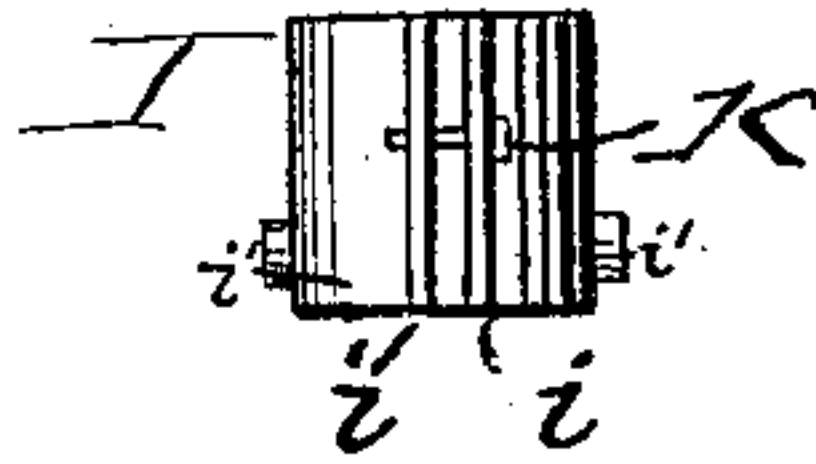


Fig. 4



Witnesses.

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UNITED STATES PATENT OFFICE.

SAMUEL BROWN, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 299,457, dated May 27, 1884.

Application filed June 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BROWN, a citizen of the United States, residing at the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Paper-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective view; Fig. 2, a rear elevation; Fig. 3, a vertical longitudinal section; Fig. 4, a front elevation of nut; Fig. 5, a vertical section of worm.

My invention relates to machines for cutting paper, and my improvements have reference to means for operating the clamp, whereby the latter will be caused to press on the stock while the knife is descending and ascending, and lifted after the knife has completed the cut.

My improvements consist in the peculiar construction and combinations of parts herein-after fully described, and refer, principally, to the combination, with the eccentric and frame or rocking levers by which the clamp-bar is lowered and raised, of a worm and nut, whereby, when the requisite pressure on the clamp-bar has been secured, it is maintained without undue strain on the draw-bars while the eccentric is rotating and the knife is cutting.

Referring to the accompanying drawings, A indicate the housings or sides of a paper-cutting machine, having a table, B, knife C, and clamp-bar D. Said clamp-bar is connected with a rocking frame, E, by connecting-rods or draft-bars *e e*, so that a rocking motion of the latter on its fulcrum-rod *e'* will produce a vertical movement of the latter. Such rocking motion is obtained by means of a shaft, F, having an eccentric, F', the strap *f* of which is connected with the cross-bar E' of the frame E.

G represents a bolt or spindle, which passes downwardly through the strap *f*, its head *g* fitting in a recess or countersink therein. Surrounding the spindle G is a loose or swiveled sleeve, externally threaded to form a worm, H. This worm enters a nut, I, threaded to receive it, said nut being split and formed with wings *i i*, which are drawn toward each other by a screw, K, whereby the friction between said worm and nut can be graduated and controlled.

The nut I has trunnions or bosses *i' i'*, which receive the inner ends of screws or center-pins L L, which pass inwardly through the sides of a yoke, E², formed on the cross-bar E' of the rocking frame E.

The operation is substantially as follows: The shaft F being rotated by any suitable means, preferably by the application of power, the connection between its eccentric and the frame E causes the latter to be depressed, and the clamp to be drawn down, thus bringing pressure on the stock beneath said clamp. As soon as such pressure becomes sufficient the friction between the worm H and the nut I will be overcome, and the former caused to turn and descend in the latter. The worm continues descending into or entering the nut until the eccentric has accomplished half a revolution, or until that part of the eccentric which is farthest from the center of its shaft is in its lowest position. The eccentric continuing to rotate thereafter, it will lift the frame E, or rock it upwardly on its fulcrum-rod, and elevate the clamp D until the draw-rods *e e* are arrested in their upward motion by meeting with stops on the heads A A. As the resistance of such stops is greater than that of the friction between the worm H and nut I, the former will then be drawn out or unscrewed from the latter, allowing the eccentric to complete its rotation without further elevating the clamp-bar. During the movement of the frame E the nut I rocks on its trunnions or centers, and the worm H, in entering and leaving said nut, turns or swivels on its spindle G. If desired, the draw-rods *e e* may be connected directly with the clamp D, where it is desired to actuate the latter by power and automatically; but to adapt the machine for use both as a hand-clamp and automatic power-clamp machine, the hand-clamp mechanism shown and described in Letters Patent of the United States heretofore granted to me, dated April 19, 1881, No. 240,376, may be employed. In such case the draw-bars *d d*, depending directly from the clamp D, are attached to a cross-bar, M, formed with racks *m m*, with which gear pinions *n n* on a shaft, N. Said shaft N carries an external pinion, *n'*, which gears with a worm, *o*, on a shaft, O, hav-

ing a hand-wheel, o' , and sustained on a rocking plate, P. The journal-boxes n^2 of the shaft N are fitted to slide vertically in slots a in the sides A A of the machine, and the rods $e e$ connect the shaft N with the rocking frame E. When the hand-wheel o' is turned, the clamp D will be raised and lowered, as required, and this may be done either to adjust the altitude of the latter or to exert hand-pressure on the stock; and when the shaft F is rotated and the frame E descends, as the pinions $n n$ are locked by the engagement of the pinion n' with the worm o , said pinions cannot turn, and the shaft N, bar M, and draw-bars $d e$ descend and ascend together, bringing down and afterward lifting the clamp D. In their ascent the journal-boxes n^2 meet the upper ends of the slots a , in which they move. This prevents their further ascension and the further upward movement of the clamp draw-bars, and opposes a resistance which causes the worm H to draw out of the nut I.

The operation of the worm-and-nut connection between the clamp and the rocking frame produces the following effect or result: When the eccentric revolves, the clamp is drawn down until it meets the stock on the table beneath. As soon as sufficient clamping pressure has been exerted on said stock, and not before, the worm begins to enter the nut, so as not to impose any further additional pull or strain on the clamp or on its draft-bars, and to maintain the tension already obtained on said bars; hence no matter what the height of the pile of paper or stock on the table may be, the clamp comes down on it and compresses it to just the required extent, and the proper amount of compression is maintained without undue strain, while the knife is descending. The extent of the descent of the clamp is thus automatically regulated according to the pile of paper beneath, the worm entering the nut when the clamp can descend no farther. A further result flowing from the use of the worm and split-nut is this: The frictional connection between the eccentric and the clamp-bar is what holds the clamp down. If, instead of a worm and nut, a smooth spindle entering a plain shell were employed, it would be difficult to secure adequate friction, and yet have the spindle move with sufficient freedom in the shell to avoid jarring and slipping; but as the pitch of the worm of itself offers resistance to the entrance of said worm to the nut, as the length of the thread is greater than that of the body

it surrounds, and as the nut is adjustable, the necessary friction for smooth and even working can be readily secured and retained. By making the worm in the first instance of such a pitch that it will offer nearly enough resistance to produce sufficient friction for the connection, any increase of friction may be readily secured by a very slight adjustment of the nut.

The knife used for the cut is operated by lever-connections with cranks on each end of the shaft F, substantially as shown in the afore-said Letters Patent. As the knife-cranks have a larger throw than the eccentric F' , the knife will move faster than the clamp-bar when both are descending; but the eccentrics and knife-cranks are so arranged that the former has slightly the lead of the latter. The effect is, that the clamp binds the stock before the knife begins to cut, but the knife rises from the stock ahead of the clamp.

What I claim as my invention is as follows:

1. The combination, with shaft F, having eccentric F' , and rocking frame E, of an intermediate swiveled worm and nut, substantially as shown and described.

2. The combination, in a paper-cutting machine, of a clamp-bar connected by bars or connecting-rods with a rocking frame, E, a shaft, F, having an eccentric, F' , and a swiveled worm and rock-nut forming a connection between said shaft and rocking frame, whereby the rotation of said shaft will depress said frame and cause said worm to enter and withdraw from said nut, substantially as and for the purpose set forth.

3. In combination with rocking frame E, having cross-bar E' , with yoke E'' , the nut I, having trunnions and sustained on screws or centers, whereby said nut may rock during the movement of said frame, substantially as shown and described.

4. In combination with eccentric F' , having strap f , the spindle or bolt G, having swiveled worm-collar H, adjustable split nut I, and rocking frame E, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of June, 1883.

SAMUEL BROWN.

Witnesses:

JOHN URIAN,
WM. H. POWELL.