(No Model.)

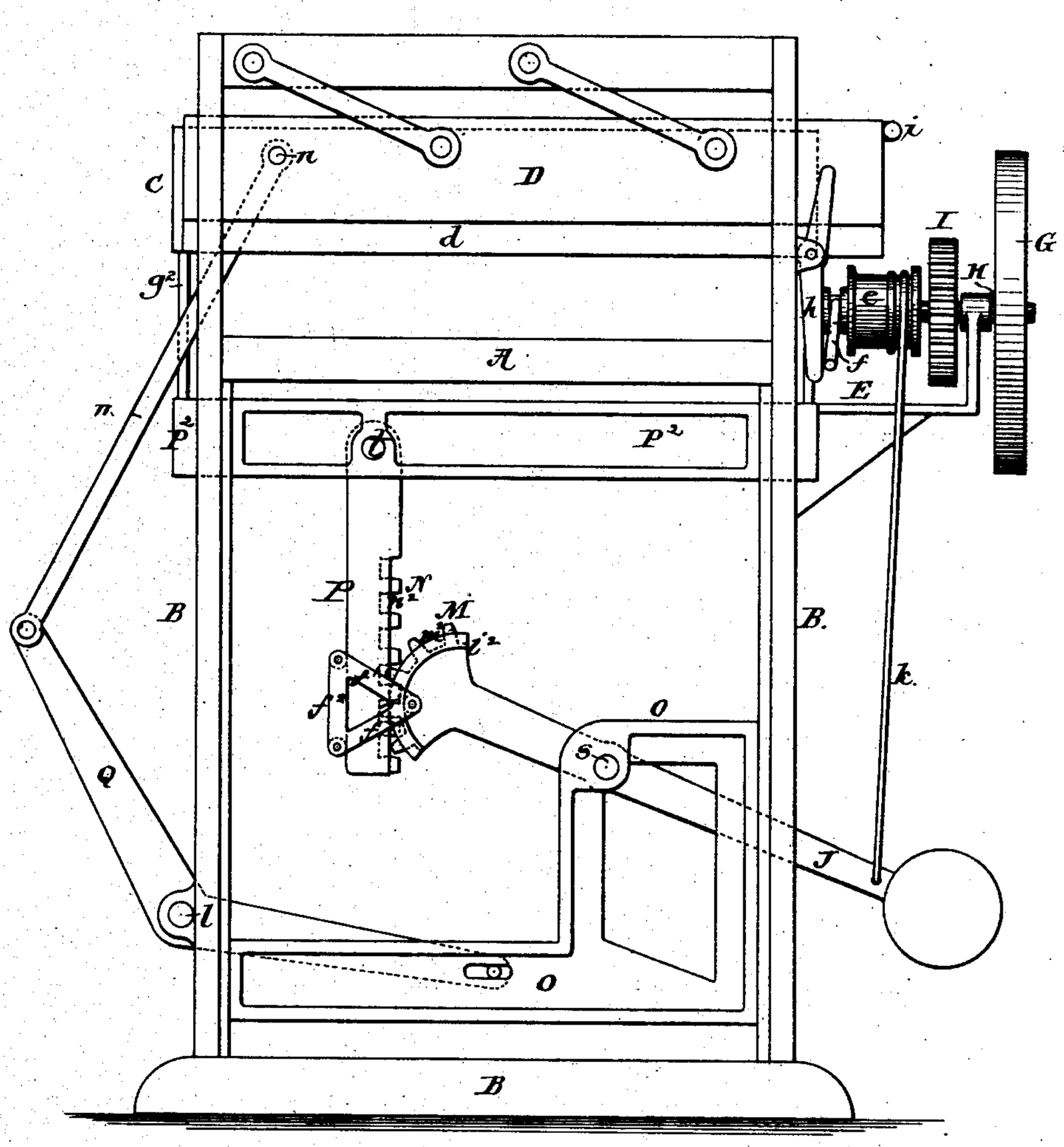
4 Sheets—Sheet 1.

E. R. SHERIDAN.

PAPER CUTTING MACHINE.

No. 244,938. Patented July 26, 1881.

Fig. 1.



Attest;
Geo. H. Graham
H. C. Janvier

Inventor,
Edwin R. Sheridan
By
J. N. McGuire
Att'y.

(No Model.) 4 Sheets—Sheet 2.

E. R. SHERIDAN.

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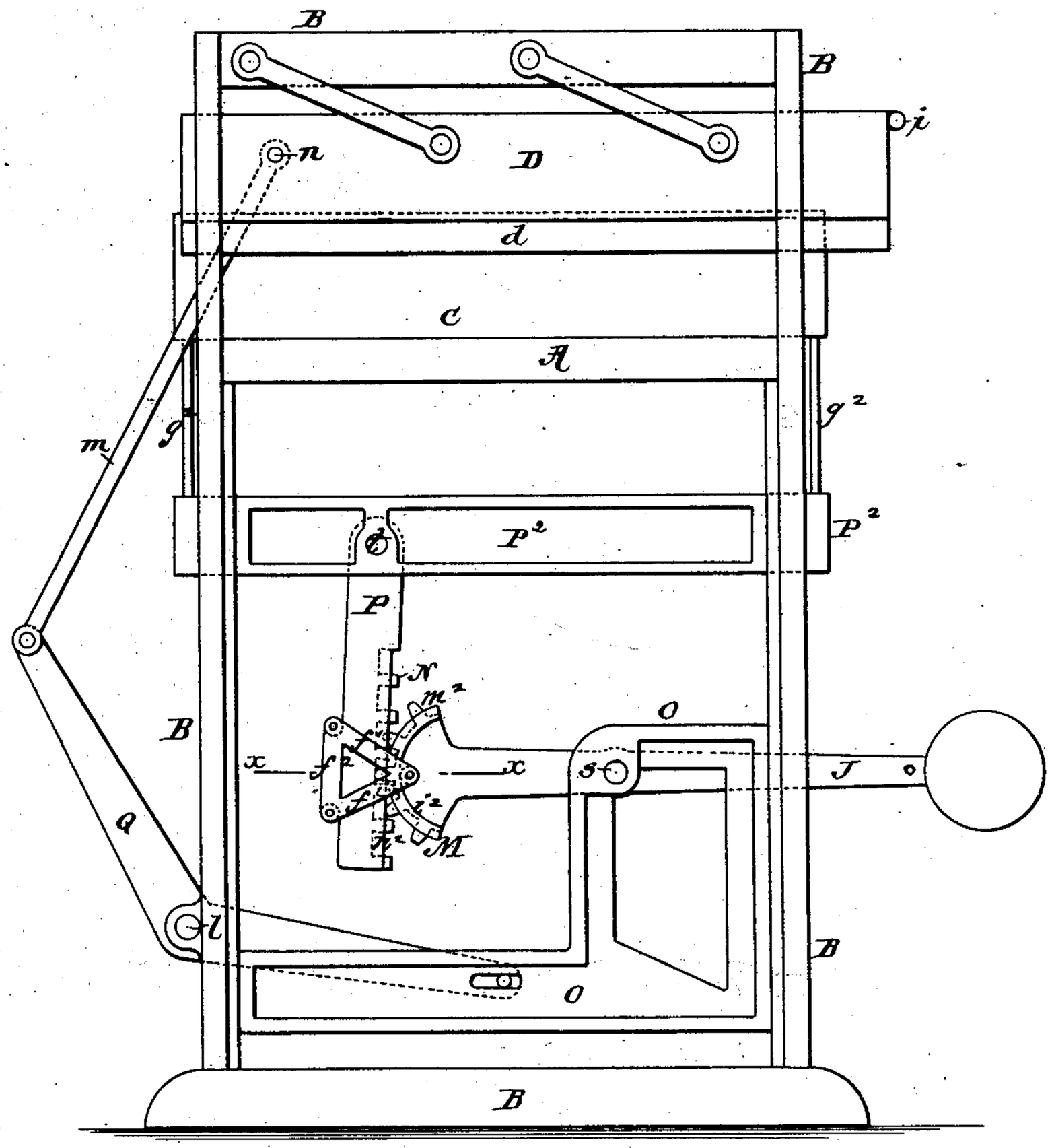
Fig. 2.



Attest;
Geo. H. Graham
H. C. Janvier

Inventor,
Edwin R Sheridan
By
J. N. McIntire
Atty.

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E. R. SHERIDAN.

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Fig. 3.

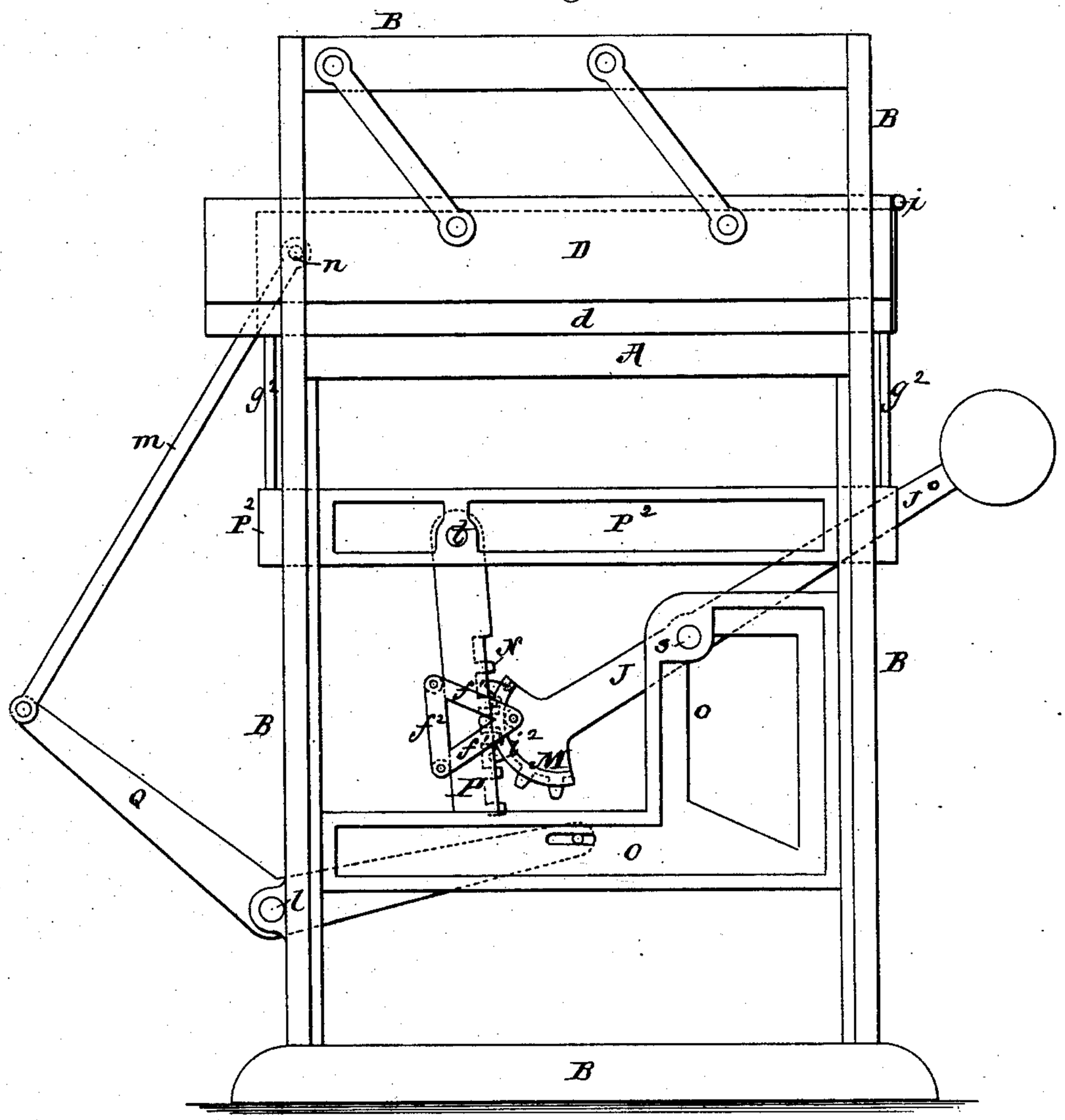
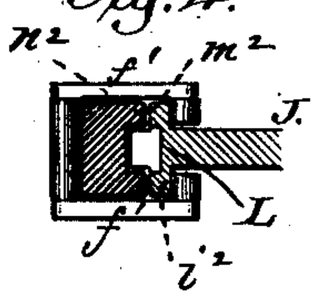


Fig. 4.



Attest;
G. H. Graham
H. C. Janvier

Inventor,
Edwin R Sheridan
By
F. N. McGuire
Att'y.

(No Model.) 4 Sheets—Sheet 4.

E. R. SHERIDAN.

PAPER-CUTTING MACHINE.

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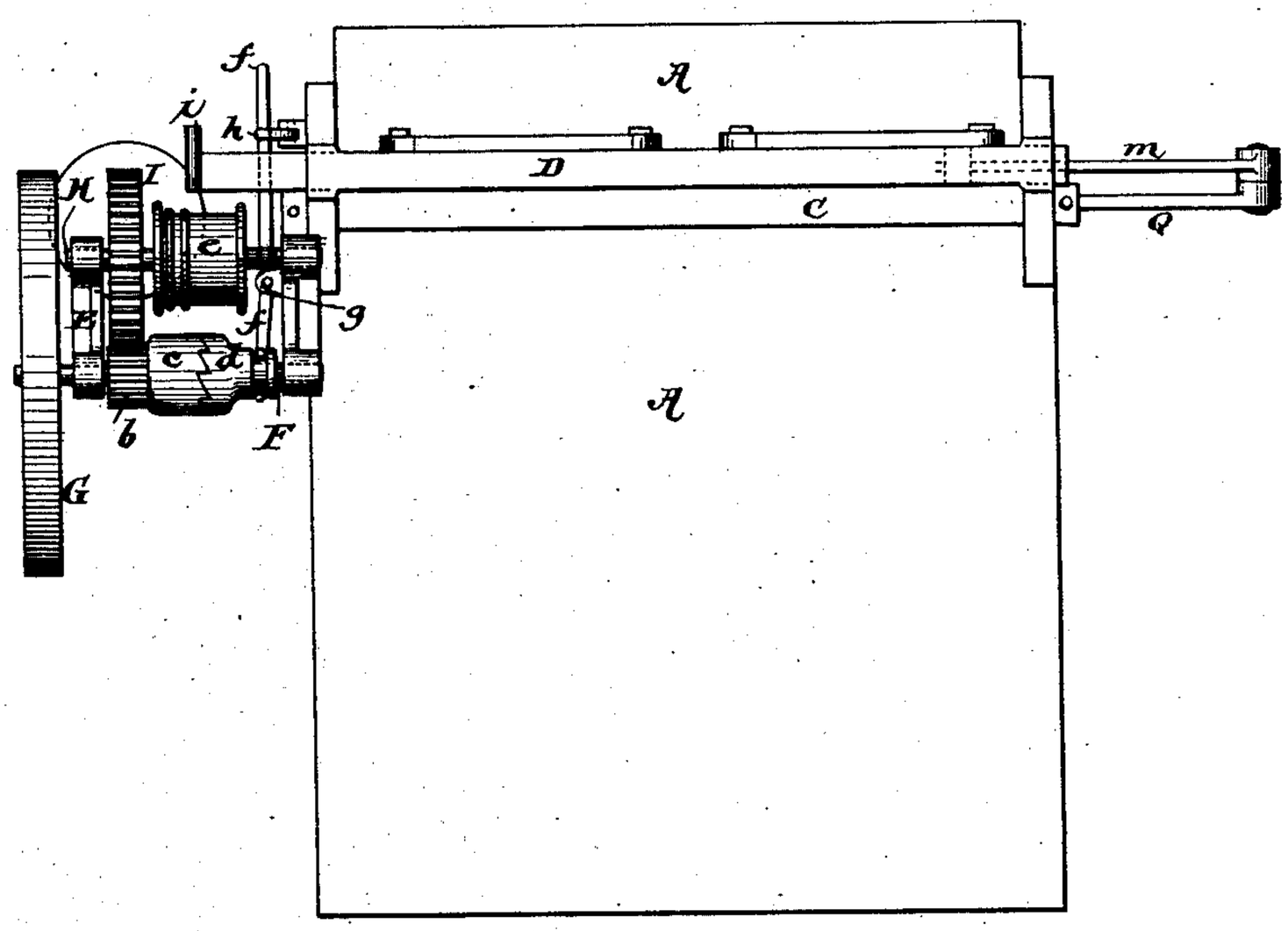
Fig. 5.



Attest;
Ed. K. Graham
H. Janvier

Inventor,
E. R. Sheridan
By
J. N. McIntire
Att'y.

UNITED STATES PATENT OFFICE.

EDWIN R. SHERIDAN, OF BROOKLYN, NEW YORK.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 244,938, dated July 26, 1881.

Application filed May 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWIN R. SHERIDAN, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Paper-Cutting Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Previous to my invention paper-cutting machines have been made in which the clamping-bar, which is first forced down onto the paper to be cut, and which firmly holds the paper in place during the cutting operation, has served to resist the force employed to move the cutting-knife, (or, in other words, has served to counteract against the power applied to the cutter,) so that the pressure of the clamping-bar upon the paper would be increased in proportion to the force necessary to be applied to the knife or shearing blade. A machine involving this principle of construction may be seen in the Letters Patent of the United States granted to me May 25, 1880, No. 227,999.

My present invention relates to this kind of machines; and it consists in the combination, with the devices carrying respectively the clamping-bar and the shearing blade or knife, of an actuating arm or lever pivoted to the vertically-moving frame which imparts the necessary motion to the clamping-bar, and provided with gear-teeth which engage with a toothed bar hinged to the frame which actuates the knife, the combination being such, as will be hereinafter more fully explained, that the lifting of the free end of said lever will first induce said lever to turn on its fixed fulcrum and operate the clamping-bar, and to then move on its creeping-fulcrum to lift the device to which it is pivoted, and thus operate the knife-frame.

To enable those skilled in the art to which my invention relates to make and use the same, I will now proceed to more fully describe the same, referring by letters to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a face view or front elevation of a machine embodying my present improvement. Fig. 2 is a similar view, but with the moving parts of the machine in different position. Fig. 3 is another similar elevation of the machine, but with the parts in still another different relative position. Fig. 4 is a detail horizontal section at the line *x x* of Fig. 2. Fig. 5 is a top view.

In the several figures the same parts will be found designated by the same letters of reference.

A is the table; B, the main frame or supporting-stand; C, the vertically-reciprocating clamping-bar that holds down the pile of paper to be cut; and D the knife frame or stock carrying the shearing-blade *d*, and having the necessary downward-sweep motion, all constructed and arranged in about the usual manner, but operated or driven by the novel means which I will now more minutely describe.

In a suitable stand, E, arranged at one side of the machine, and in the case shown about on a level with the table, is mounted in suitable bearings, the main driving-shaft F, provided with a pulley, G, for the application (by a belt) of the motive power. On this main shaft are mounted so as to turn freely, but not move endwise, a pinion, *b*, and half-clutch *c*, and so as to move endwise on it, but not turn thereon, a half-clutch, *d*, the arrangement of these parts being such that a movement of the half-clutch *d* upon the said shaft F in one direction or the other will either cause any rotation of said shaft to be imparted to the said pinion *b* or permit said shaft to revolve without turning said pinion. In the same stand E is mounted the counter-shaft H, on which are made fast a spur-gear, I, and a drum or strap-wheel, *e*, the said gear I engaging with the pinion *b*, and the said wheel or drum *e* having made fast to its periphery one end of a cord or strap adapted to be wound upon said drum, and having its outer end fastened to the end of a lever designed to be lifted, for purposes to be presently explained.

f is a shipper-bar pivoted in a lug, *g*, projecting horizontally from a portion of the stand E, and adapted, by a vibratory movement, to move the half-clutch *d* to throw the driving-shaft into or out of working engagement with the driving-gears. This shipper-bar is moved by hand in one direction to throw the driving-gears into a working condition, and is automatically moved in the other direction to throw

the parts out of gear by a tripping-lever, *h*, pivoted to the main frame, as shown, and moved by a projecting lug or pin, *i*, on one end of the knife-frame.

J is the main working-lever of the machine. It is weighted at its outer or free end, near which the strap or cord *k*, by which said end is lifted, is applied, as clearly shown. This lever J is pivoted at *s* to a vertically-reciprocatory frame, O, and it is formed or provided at its inner end with a toothed sector or segment of a gear, M, which engages with a rack, N, cut on or attached to a pendent arm, P, that is pivoted or hinged at *t* to the vertically-reciprocatory frame P^2.

To insure the retention in gear of the sector M and the hinged rack N, these parts are clasped at their moving points of contact by the arms *f' f'* and f^2 of a carriage, provided with anti-friction rolls that bear, one of them against a flange, i^2, of the sector, and two others of them against the back side of the pendent arm P.

To prevent undue pressure on the teeth of the rack and sector endwise, and keep these devices properly in engagement without undue friction, I provide the sector at each side with a curved bearing flange or surface, m^2, which rolls against a straight bearing-surface, n^2, of the arm P, as most clearly exhibited at Fig. 4.

The frame P^2 is rigidly connected by side bars, g^2, as shown, to the clamping-bar C, which is thus caused to move always with said frame.

Q is a bent lever, pivoted near its angle by a pin, *l*, to the main frame, and having its lower end connected by a pin-and-slot connection to the lower middle part of frame O, while its upper end is pivoted to one end of a connecting-rod, *m*, the other end of which rod is connected at *n* to the knife-frame.

In the operation of the machine, the power being applied by a proper movement of the shipper handle or bar, the rotation of the strap-wheel or drum winds up the cord or strap *k*, and thereby the weighted end of lever J is lifted. During the initial movement of said lever it turns or vibrates on its pivotal point *s* as a fixed fulcrum, and by the vibratory movement of its sector M about the point *s* causes the toothed arm P to be pulled down, thereby depressing the frame P^2 and bringing the clamping-bar C down onto the pile of paper resting on the table A. When this bar C shall have come to a solid bearing on top of the pile of paper, so that the frame P^2 and rack-arm P can no longer move on, the continued ascent of the weighted end of lever J causes said lever to then vibrate about the point of engagement of its sector M with the rack N, the engaging teeth of these devices constituting a changing or creeping fulcrum of said lever, so that its fulcrumed end climbs up the rack N, while at the same time the frame O is lifted by the pivotal connection therewith of said lever at the point *s*. The ascent of the frame O lifts the inner lower end of bent lever Q, turning it on its pivot *l*, and thereby the knife-frame D is swung down through the medium of pitman *m*, which connects said frame with the upper outer end of lever Q, as shown.

It will be seen that by the employment of the lever J, pivoted to the frame O, as described, and provided with a sector, M, to engage with the rack N, the clamping-bar C is quickly brought to a bearing on the paper to form a point of counter-resistance, as usual, to the power to be applied to do the cutting, and that the cutting device is then actuated by a slower movement of the lever, but with a more economical and effective application of the motive power applied to the machine, since, by reason of the ascending or climbing movement of the toothed end of said lever, the pull on its outer free end is always more nearly in the direction of movement of that end. During that part of the motion of lever J in which it swings from its toothed end as a creeping-fulcrum the arm P, of course, vibrates about its pivotal connection *t* sufficiently to permit the frame O, which is attached by a fixed pivotal point, *s*, to said lever, to move up in a vertical right line, and during the movement together of the said arm P and the sector M these parts are held toward each other by the clasping-carriage above referred to, which moves automatically to adjust itself to the motion of the sector on the rack, and they are prevented from crowding toward each other in a manner to force the cog-teeth too hard together by the opposing bearing-surfaces m^2 and n^2, before referred to.

What I claim as new, and desire to secure by Letters Patent, is—

In combination with the frames O and P^2 for actuating, either directly or indirectly, the clamping-bar and the cutter-frame, a lever, J, pivoted to one of said frames, and connected to the other through the medium of a sector and toothed flexibly-attached arm, all substantially as set forth.

In witness whereof I have hereunto set my hand this 19th day of May, 1881.

E. R. SHERIDAN.

In presence of—
M. E. JANVIER,
H. C. JANVIER.