

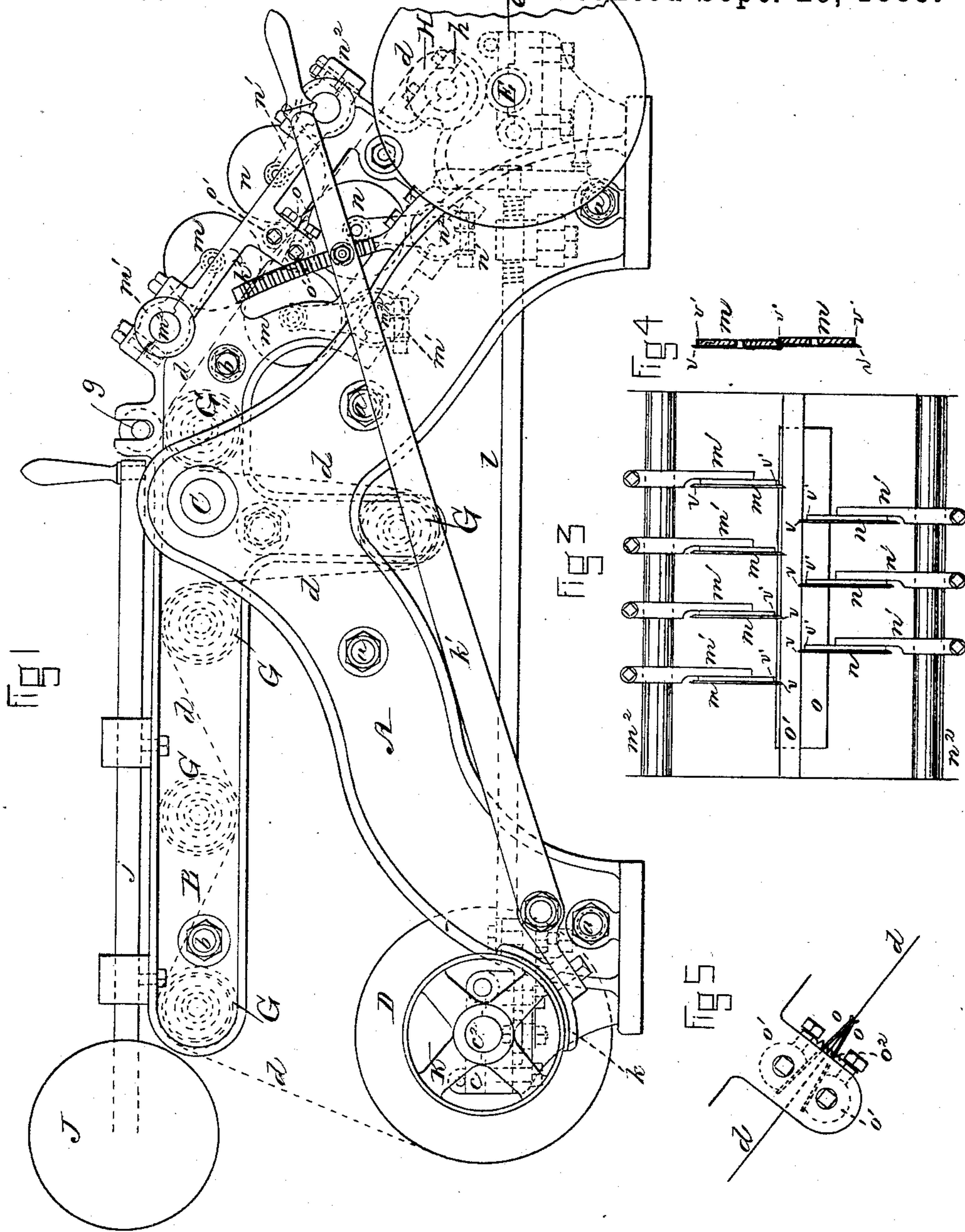
(No Model.)

2 Sheets—Sheet 1.

H. C. SPALDING.
PAPER CUTTING MACHINE.

No. 327,471.

Patented Sept. 29, 1885.



WITNESSES
W. Frisby
H. D. Bartley

INVENTOR
Henry C. Spalding
By Parker W. Page
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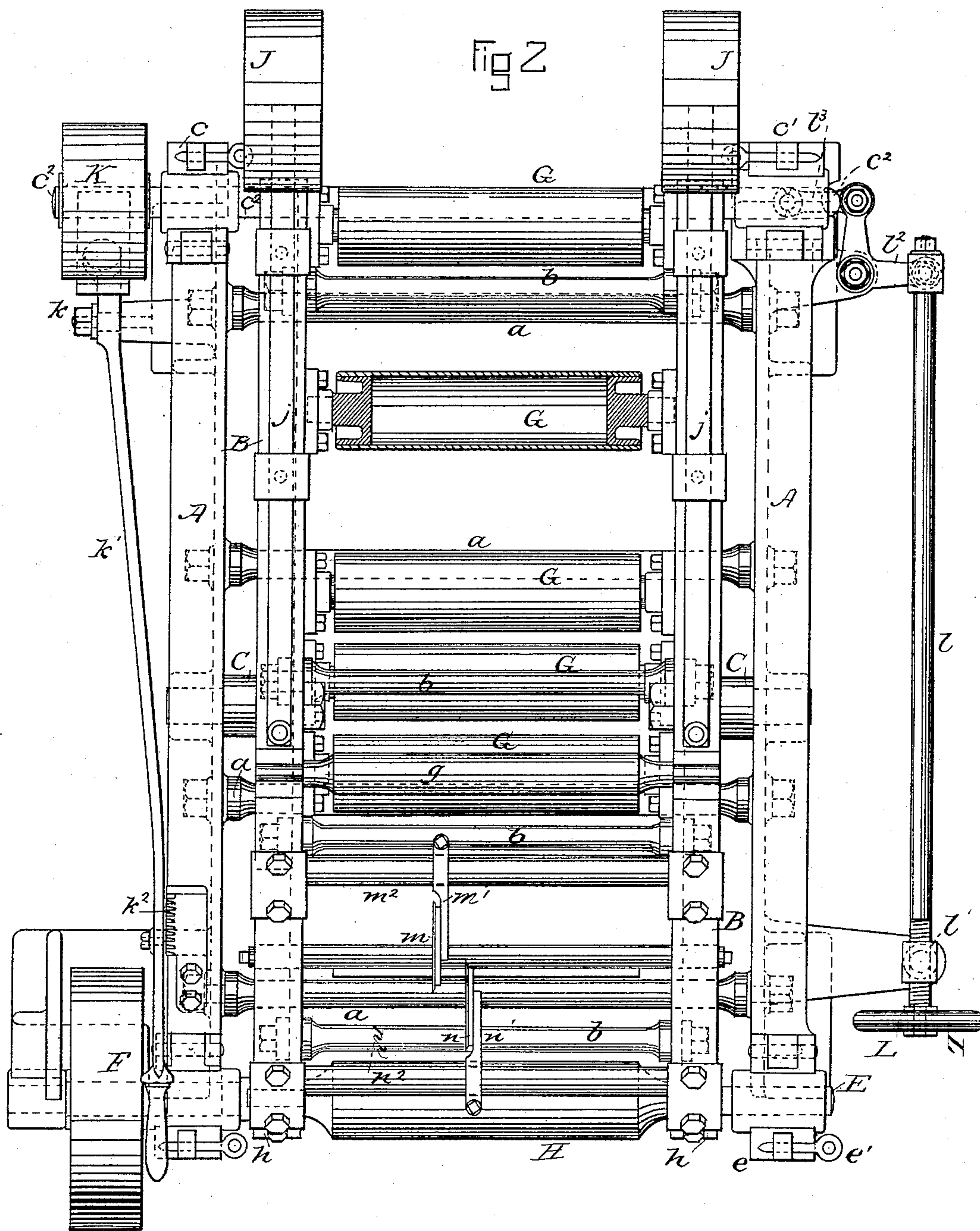
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UNITED STATES PATENT OFFICE.

HENRY C. SPALDING, OF BOSTON, MASSACHUSETTS.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 327,471, dated September 29, 1885.

Application filed April 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SPALDING, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Cutting Paper for Insulation of Electrical Conductors, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The subject of my present invention is an apparatus for cutting a web of paper into narrow strips suitable for use in the manufacture of insulated electric cables and specially adapted therefor.

Heretofore machines have been constructed for dividing a web of paper into strips; but in such as are constructed or adapted for cutting strips sufficiently narrow to be wound spirally upon an ordinary telegraph-wire the paper is liable to be torn, so that continuous rolls of the proper size and quality for the economical insulation of fine wires are difficult to obtain. It is my object to improve upon the construction of these devices, and to produce a mechanism by means of which I can rapidly cut into very narrow strips and wind in continuous rolls a web of paper of any thickness. I will describe my improvements by reference to the accompanying drawings, and indicate the features of novelty in the claims.

Figure 1 is a side view in elevation of my improved machine. Fig. 2 is a plan view of the same. Figs. 3 and 4 are details in plan and diametric section, respectively, of the cutting devices. Fig. 5 is a detail in elevation of a guide for use in conjunction with the cutters.

Similar letters of reference indicate corresponding parts in all the figures.

A is the frame supporting the operative portions of the device, and consisting of two plates held together by tie-rods *a*.

B is a rocking frame supported on the shaft C, and consisting of side plates held together by tie-rods *b*. In journal-boxes *c c'*, mounted upon one end of the frame A, and near the base of the same, is a shaft, *c'*, upon which is wound the roll of paper D. In frame B are journaled a number of cylinders or rolls, G G, in substantially the relative positions shown in Fig. 1. The web of paper *d* is carried alternately

over and under these cylinders to the cutting mechanism, the requisite tension being by this means secured. After passing through the cutters the longitudinally-divided web is carried over a cylinder, H, in bearings *h* on the end of frame B, and wound upon a shaft, E, in bearings *e* on the frame A. The cylinder H rests upon the paper as it is wound around the shaft E, and serves both to form a compact and even roll and to support the weight of the cutting mechanism. The weight of this latter is counterbalanced by weights J, carried by rods *j*, arranged to slide on the horizontal portion of the frame B.

As a means for adjusting the tension of the web *d*, a wheel or disk, K, is keyed to the shaft *c'*, and with this is combined a brake-shoe, *k*, carried by lever *k'*, pivoted to frame A and held in the desired position by a rack, *k''*. This arrangement also secures the roll D from sudden movement in either direction. With the shaft *c'* and roll D are also combined means for imparting thereto a longitudinal movement by which they are adjusted to deliver the web evenly. For this I use a rod, *l*, with a threaded portion turning in a nut, *l'*, and provided with a hand-wheel, L, easily accessible to an operator from the forward part of the machine. The rod *l* is properly connected with a bell-crank lever, *l''*, which in turn connects with the bearing *e'* of shaft *c'* by a link, *l'''*. The bearing *e'* is capable of movement in line with the shaft *c'* and carries the latter with it. Both the shaft *c'* and the shaft E are removable at will, the bearings being made with upper hinged sections that may be lifted by removing a pin, such as *e'*.

The cutters which I use are disks *m* or *n*, having cutting-edges *v*, and shoulders, which latter are preferably covered with a yielding material—such as leather—as at *v'*. The cutters are arranged in pairs, each disk being supported by an arm, *m'* or *n'*, secured to a shaft, *m''* or *n''*, and placed so that the paper in being drawn between them is compressed by the shoulders and imparts a rotary motion to the disks. The web, after passing through the first row or series of cutters *m*, is drawn through a second row or series, *n n*, placed so as to subdivide the strips into equal divisions.

When a multiplicity of cutters in a row act

at the same time upon a sheet of paper to cut it into very narrow strips, the lateral tension upon the paper between the cutters is apt to cause breakage or tearing of the strips, and it is partly to avoid this liability to rupture the strips that I place the cutters in two rows. Another reason is that it is difficult to arrange the cutters in a single row as close together as is sometimes required for cutting very narrow strips.

In practice I have found that the strips formed by the first cutters have not the requisite rigidity to maintain them in proper condition for the second, and that they are apt to be unevenly cut or folded. Between the two rows of cutters I therefore place a guide or series of guides, and through these I draw the divided web.

For the guide I employ flexible plates *o o*, secured to bars *o' o'*, from which arms extend that are connected by a spiral spring, *o²*, or equivalent device, at one or at both ends of the plates *o*. The divided web, after leaving the plates *o*, is drawn through the cutters *n* and thus subdivided.

The method of operating the device which I have thus described and the functions of the several parts I will now describe in detail.

A roll of paper is first wound on the shaft *c²* and carried alternately over and under the rolls *G* to the roller *E*. During this operation the upper cutting-disks are raised, if so desired. By means of the hand-wheel *L* the position of the roller *o²* is adjusted so that the web travels evenly to the roller *E*. The requisite tension is then obtained by the adjustment of lever *k'*, which by the specified means is then locked. The roller *g* is inserted in its bearings to smooth out the web before it passes between the cutters, and the latter are then brought together for operation. The weighted bars *j* are also adjusted to produce the requisite pressure of the roll *d* upon the divided web as it is rolled onto the roller *E*. The subsequent operation of the machine is a continuous and even one, the strips formed

by the cutters being wound upon the roll *E* smoothly and evenly. When the latter is full, or when the roll has all been drawn off, the roll *E* is taken off and the strips reeled off on separate spools or used directly from the roll, as occasion may render necessary.

I am aware that machines for dividing a web of paper have heretofore been constructed in which the web is carried from a delivering-reel over and under tension-rolls and through cutters to a receiving or winding reel, the tension-rolls and cutters being carried by a pivoted frame, and this I do not claim. I do not, however, limit myself to the specific construction of the parts hereinafter enumerated as the subject of my present invention, though I have described the forms which I have found best adapted to the purpose.

What I claim is—

1. In a machine for dividing a web of paper, the combination, with means, substantially as described, for delivering, and means, as indicated, for receiving and reeling the web, of two rows or series of cutters for dividing and subdividing the web and a guide or guides between said rows or series of cutters, substantially as and for the purpose set forth.

2. In a machine of the kind described, the combination, with the two rows or series of cutters, of the flexible metal plates *o o* and springs *o²*, located between the two series of cutters and forming a guide or guides for the divided web, substantially as herein described.

3. In a machine of the kind described, the combination, with the delivery-reel, of the bell-crank lever *l²*, the link-connection to or with the bushing of the delivery-reel, and the threaded bar or rod *l*, for adjusting the position of the bushing and reel, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 18th day of April, 1884.

HENRY C. SPALDING.

Witnesses:

SANFORD H. DUDLEY,
WARREN P. DUDLEY.