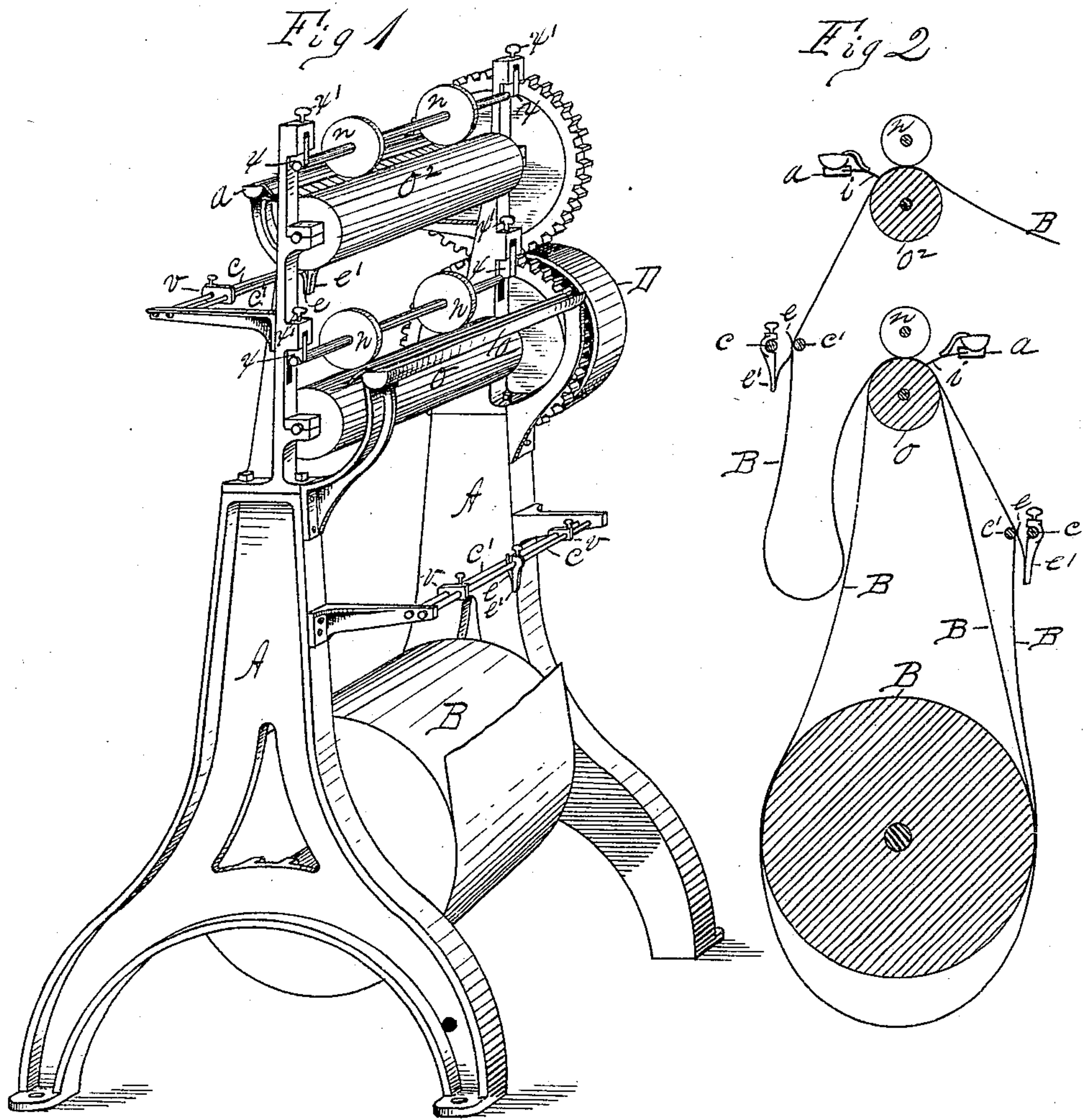


(No Model.)

S. A. GRANT.
RULING MACHINE.

No. 258,642.

Patented May 30, 1882.



Witnesses
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SIDNEY A. GRANT, OF SPRINGFIELD, MASSACHUSETTS.

RULING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 258,642, dated May 30, 1882.

Application filed February 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY A. GRANT, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Vertical Compound Ruling-Machines, of which the following is a specification.

This invention relates to improvements in ruling-machines provided with duplicate sets of ruling-pens, the object being to provide improved devices for ruling a continuous strip of paper upon both sides thereof by once passing it through the machine, and to provide improved mechanism for so unrolling the paper from a roll that it may freely be drawn under the ruling-pens irrespective of the weight of said roll.

In the drawings forming part of this specification, Figure 1 is an elevation of a ruling-machine constructed according to my invention. Fig. 2 is a side elevation of the rollers, paper tensions and guides, and pen-supporting devices of the machine, with the frame thereof removed, showing the manner of conducting the strip of paper from its roll through the machine.

In the drawings, A is the frame of the machine. B represents the roll and the strip of paper drawn therefrom. *c c'* are gage and tension-supporting rods. *v v v* are gage-blocks adjustable on rods *c c'*. *e'* is a tension-spring support. *e* is a tension-spring. *o o²* are paper-carrying rollers. *n n n n* are pressure-rolls. *a a* are pen-supporting devices. *i* indicates ruling-pens. *x* are pressure-blocks, and *x'* are pressure-screws.

Like letters refer to like parts in the different figures.

The machine herein described provides simple and efficient means for ruling a strip of paper to form thereon series of parallel lines from end to end of said strip, and upon both sides thereof, by once passing said paper through said machine, and provides novel means for drawing the paper to be so ruled from a roll thereof of considerable size and weight, but without any tensile strain upon that part of said strip which is passing over the paper-guides and under the ruling devices which can interfere with its regular and uniform move-

ment, which is essential to the production of good ruling.

The frame A of the machine supports near its base a transverse shaft, upon which is rolled the paper B preparatory to ruling it, and two carrying-rollers, *o o²*, are hung in said frame above said roll of paper. Said rollers *o o²* are geared together, and upon one of them is secured a driving-pulley, D. Directly over said rollers *o o²* are two shafts, each having bearing upon either end thereof a pressure-block, *x*, properly guided and supported in frame A, and each of said blocks having a pressure-screw, *x'*, set in said frame directly over it, and adapted to be screwed down upon said block. Upon each of said shafts, which are hung under said blocks, are two rolls, *n n*, whose peripheries bear upon the surface of said rollers *o o²* with more or less force, according to the adjustment of said screws and pressure-blocks.

The pen-supporting devices and pens represented by the letters *a* and *i* may be of any of the ordinary descriptions, and are supported upon proper brackets in such a position that the pens *i* may rest upon said rollers *o o²*, as shown, one set of pens upon each roller, and each set upon opposite sides of the machine.

Upon brackets projecting from opposite sides of frame A are secured the gage and tension supporting rods *c c'* in pairs—two on each side of the machine. Upon each pair of said rods are placed two gage or guide blocks, *v*, adapted to be moved thereon and set to certain positions by proper set-screws in them, as shown. Upon each of said rods *c* is provided a tension-spring support, *e'*, so secured thereto as to be moved horizontally upon said rods or turned thereupon, and arranged to be set by a suitable screw to the desired position on said rods. On each of said supports *e'* is fixed a tension-spring, *e*, adapted to bear against the rod *c'*.

The operation of my machine is as follows: The end of the strip of paper from the roll B is carried first back of the lower pair of rods *c c'*, and over roller *o*, between the face of the latter and the peripheries of the pressure-rolls *n n*, and thence down under said roll B, and is made to hang loosely under the latter, as shown, the end of said strip being now carried up between the lower pair of rods *c c'*, and between the tension-spring *e* and said rod

c' , and thence again between roller o and the rolls $n n$, which run upon its surface, and lying upon that part of said strip of paper which was first carried over said roll o , as aforesaid.

5 The said paper strip is now allowed to hang down in a loop shape below roll o , as shown in Fig. 2, and then carried between the upper pair of rods $c c'$ upon the left-hand side of the machine and under the tension-spring e , as
10 aforesaid, and thence between the face of roll o^2 and the peripheries of the rollers $n n$ bearing thereupon, and thence the paper passes to any convenient roll, upon which it is wound, or to the usual cutters, by which it is cut into
15 sheets. As the paper strip passes over roll o and roll o^2 , as aforesaid, it passes under the ruling-pens i , of the usual construction, and as it passes over the roll o it is ruled on one side and upon the opposite side, as it passes
20 over the upper roll, o^2 .

The gage or guide blocks v on rods $c c'$ are set on said rods according to the width of the strip of paper, and serve to keep the paper in a proper line of movement under the ruling-
25 pens and over the rolls $o o^2$. The tension-springs $e e$ serve to keep the paper strip straight as it goes under the pens by offering a slight resistance to the paper as it passes along. The effect of the pressure of rolls $n n$ upon the under
30 line of said paper strip, which is first carried over roll o , is to cause the paper to draw with a steady motion off from roll B and to cause the tensile strain upon said strip, which the rotation of roll B causes, to be thrown entirely
35 upon that part of the paper which first passes from said roll B between the face of roll o and the rolls $n n$. Thus the overlapping portion of the paper strip which runs outside of the first one and between the rods $c c'$ and under
40 the pens i is so freed from all tensile strain that it can be drawn with ease and regularity thereunder, and good ruling be done. The paper strip, after having passed by roll o , is al-

lowed to freely hang down, as shown, to give its first-ruled side time to dry and to give it a
45 free and easy movement toward the upper and second set of ruling devices. The passage of two superposed strips of paper between roll o and the rolls $n n$ bearing thereon causes no inconvenience; but roll B is steadily turned and
50 the upper strip moves steadily and with a uniform motion while being ruled, as does also that part of the strip which runs singly between roll o^2 and under rolls $n n$.

It is obvious that ruling upon one side of the
55 paper strip can be conveniently accomplished by passing said strip only under the lower line of pens i and over roll o .

What I claim as my invention is—

1. In a machine for ruling two sides of a strip
60 of paper simultaneously, the combination, with two sets of ruling devices, of the rolls $o o^2$ and adjustable pressure-rollers $n n$ to revolve and bear upon the paper as it passes between said
65 rolls $o o^2$ and said rollers $n n$, substantially as set forth.

2. In a paper-ruling machine, the combination of two pairs of rods, $c c'$, two tension-springs, e , two sets of suitable ruling devices, the rolls
70 $o o^2$, and two pressure-rollers, $n n$, to bear upon each of said rolls $o o^2$, substantially as set forth.

3. The within-described improvement in the method of feeding a strip of paper from a roll, B , thereof to the ruling devices of a paper-rul-
75 ing machine, which consists in seizing the end of said strip which leads directly from said roll between revolving pressure-rollers, then passing said end loosely around said roll, then between a suitable tension device and under ruling devices, and again between said revolving
80 pressure-rollers, substantially as set forth.

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Witnesses:

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