(No Model.) 3 Sheets—Sheet 1.

J. SCHUMACHER.

RULING MACHINE.

No. 387,012. Patented July 31, 1888.

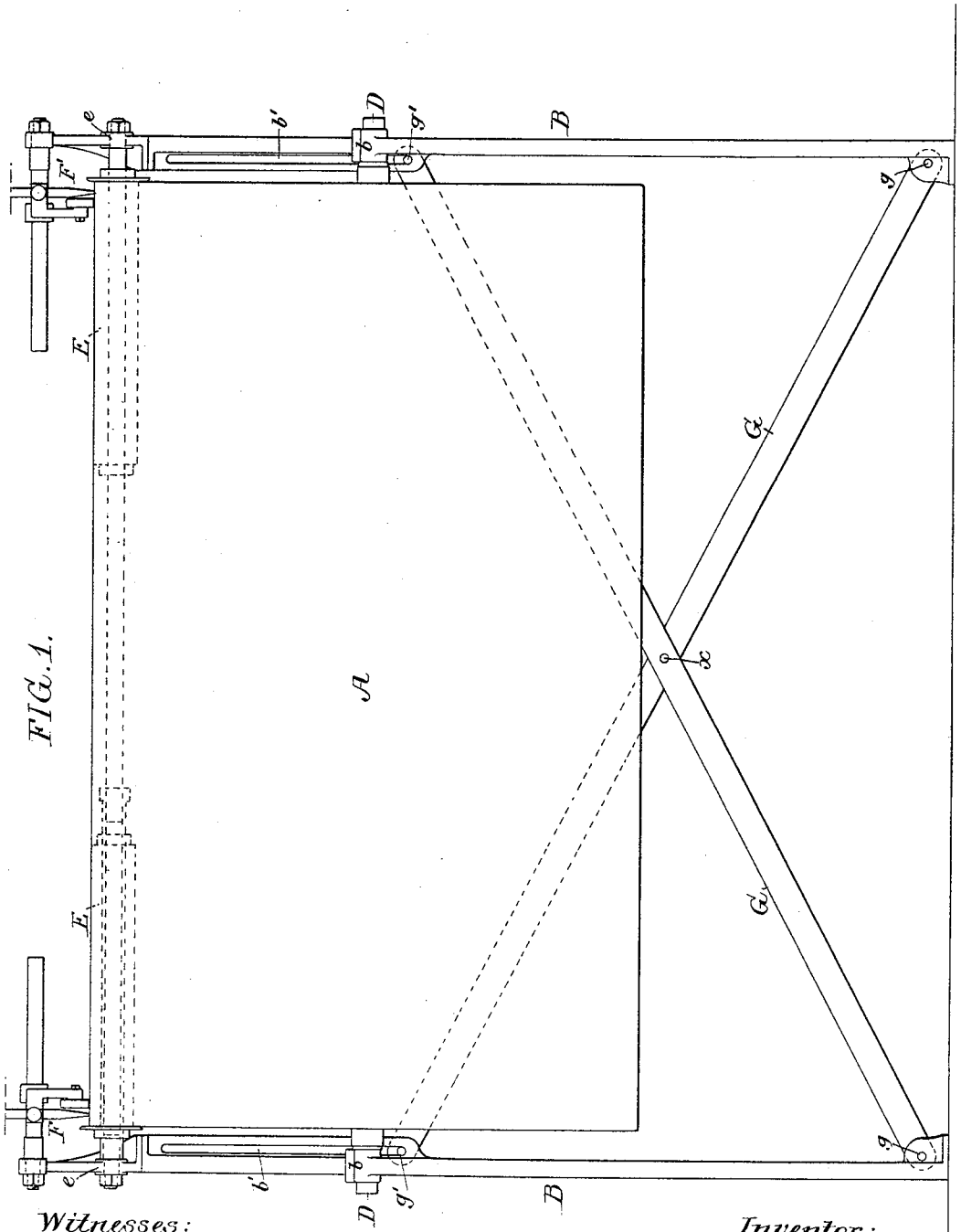

FIG. 1.

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Inventor:
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by his Attorneys,
Howson & Sons

(No Model.) 3 Sheets—Sheet 2.

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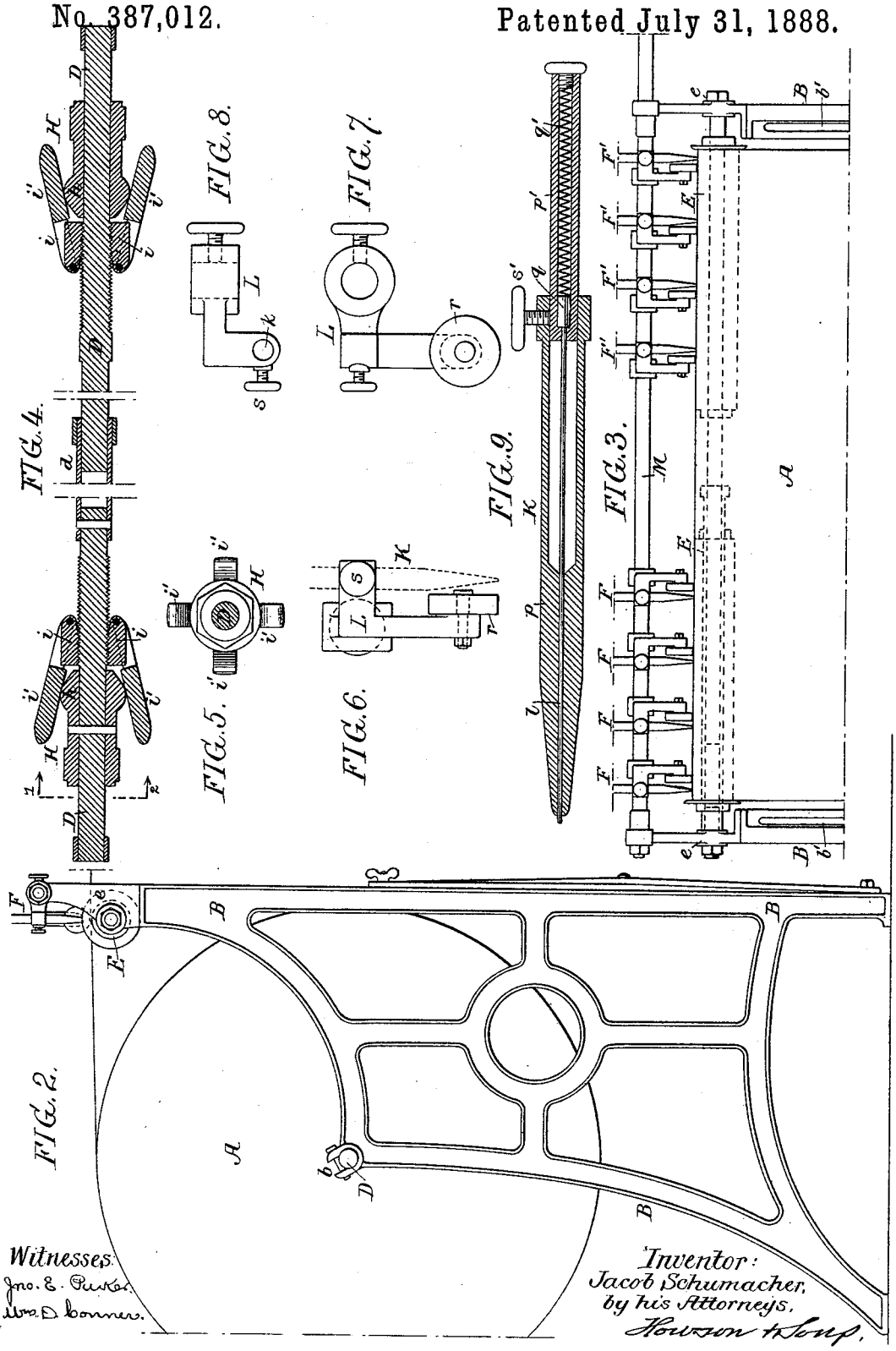

(No Model.) 3 Sheets—Sheet 3.

J. SCHUMACHER.

RULING MACHINE.

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FIG. 10.

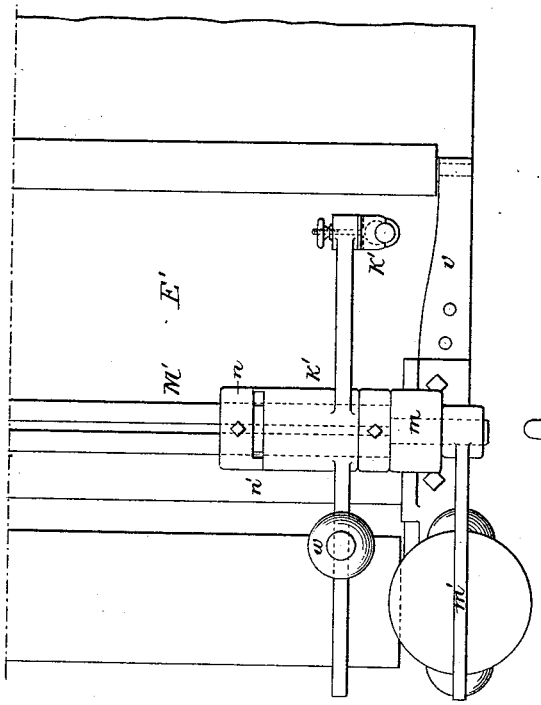


FIG. 12.

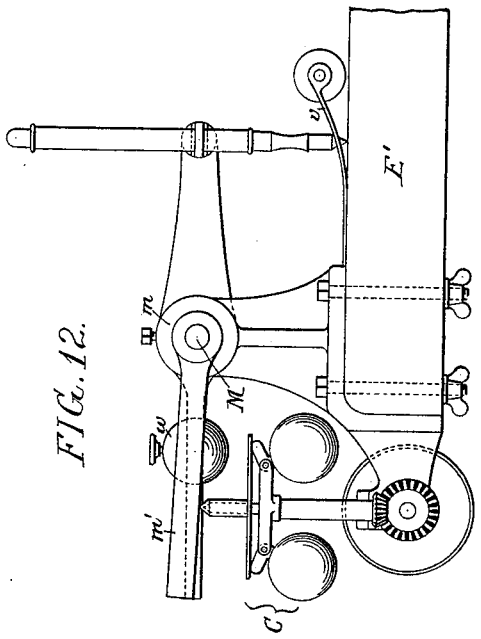
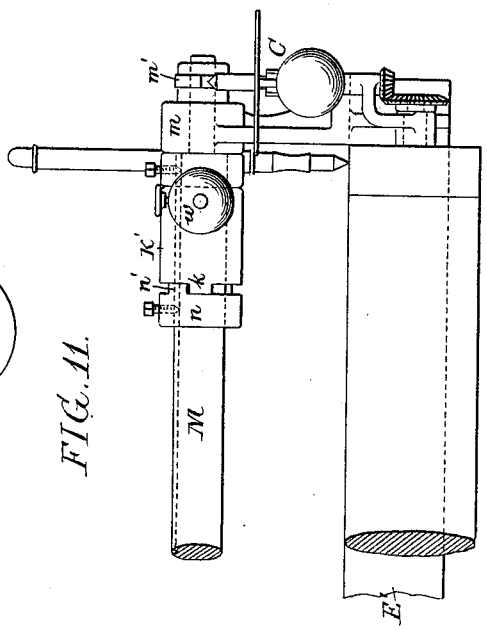


FIG. 11.



Witnesses.
Jno. E. Parker.
William D. Conner.

Inventor,
Jacob Schumacher.
By his Attorneys Howson & Sons

UNITED STATES PATENT OFFICE.

JACOB SCHUMACHER, OF CAMDEN, NEW JERSEY.

RULING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 387,012, dated July 31, 1888.

Application filed September 14, 1887. Serial No. 249,649. (No model.)

To all whom it may concern:

Be it known that I, JACOB SCHUMACHER, a citizen of the United States, and a resident of Camden, Camden county, New Jersey, have invented an Improved Ruling-Machine, of which the following is a specification.

My invention relates to machines for ruling or lining paper or fabrics; and the main objects of my invention are to adapt the machine to the ruling of different widths of paper, to facilitate the mounting of the roll of paper upon the machine and insure its retention on the mounting-spindle, and to improve the construction and operation of the marking devices.

In the accompanying drawings, Figure 1 is a front view of a machine constructed in accordance with my invention for the ruling of border-lines for paper, &c. Fig. 2 is a side view of the same. Fig. 3 is a front view of the upper part of a machine for ruling spaced lines. Fig. 4 is a longitudinal section, drawn to a larger scale, of the spindle for carrying the roll of paper. Fig. 5 is a transverse section on the line 1 2, Fig. 4. Figs. 6, 7, and 8 are views drawn to a larger scale of the holder for the marking-instrument. Fig. 9 is a sectional view, drawn to a still larger scale, of a pencil form of marking-instrument which may be used; and Figs. 10, 11, and 12 are views of a modified form of marking device, in which the pressure of the instrument upon the paper is automatically regulated by the speed at which the paper passes through the machine.

A is the roll of paper or other material to be ruled, and B B are the side frames of the machine, which are provided with bearings *b b* for the extensible shaft or spindle D, carrying the roll of paper. These side frames are also provided with bearings *e e* for the extensible roller E, over which the paper passes, and which supports the paper against the pressure of the ruling-instruments F F, these latter being carried by the frame.

In the machine shown in Fig. 1 only two marking-instruments are shown—one at each side—for marking the border-lines for the paper; but it will be readily understood that the number of these marking-instruments may be varied, according to the width of the machine. In Fig. 3, for instance, I have shown a number of such instruments.

In order that the machine may be adapted for the ruling of paper of different widths, the two side frames, B B, are adjustable toward and from each other. These frames are connected at the back by diagonal cross-straps G G, Fig 1, pivoted at their lower ends at *g g* to the side frames, and connected at their opposite ends to the upper parts of the frames by bolts and nuts *g' g'*, passing through slots *b'* in flanges in the side frames, so that by loosening these bolts and nuts *g' g'* and sliding them in the slots *b' b'* the frames may be adjusted toward and from each other, and then secured again after adjustment. The diagonal straps are preferably pivoted to each other at *x*, Fig. 1. As I have said, the spindle or shaft D, which carries the roll of paper, is extensible to allow of the described adjustment of the side frames. This extensibility I obtain by providing a telescopic joint, *d*, Fig. 4, between the ends of the shaft or spindle.

In order to permit the roll of paper to be readily applied to the spindle and yet be securely held thereon, I provide the opposite ends of the spindle with expansible mandrels H H. On each end of the shaft is fixed a wedge-collar, *h*, on which bear a number of arms, *i'*, (four, in the present instance, Fig. 5,) pivoted to a collar, *i*, adapted to a threaded portion of the shaft. By turning this collar on the screw-thread so as to move it toward the wedge *h* the arms *i'* will be expanded. In the first instance the collars *i* are moved away from the wedges, so that the arms of the mandrel may be contracted to allow the roll of paper to be slipped over the spindle D before the latter is put on the frame. Then the two ends of the spindle or mandrels are so turned as to move the collars *i* toward the wedges and expand the arms *i'*, to grip the paper sufficiently firmly to hold it.

The roller E, over which the paper to be marked passes, is made extensible by any suitable form of telescopic joint, as indicated, for instance, by dotted lines in Figs. 1 and 3. This roller may be replaced by a bar or table, as illustrated in the modification, Figs. 10, 11, and 12.

The marking-instrument K in the construc-

tion shown in Figs. 1 to 8 is carried by a holder, L, mounted on or pivoted to a rod, M, fixed to the upper part of each side frame. This holder has an opening, *k*, for the reception of the marking-instrument, and the latter can be adjusted therein to the desired position and held by a set-screw, *s*.

The holder L may be provided with an anti-friction roller, *r*, to run on the paper to keep the latter down on the roller or table and to keep the point of the marking-instrument in the proper position and facilitate the traverse of the paper.

In Fig. 9 I have shown the marking-instrument as being in the form of a pencil. The pencil-holder is in two telescopic parts, *p p'*, held in the different positions to which they may be adjusted by a set-screw, *s'*, while a piston, *q*, acted on by a spring, *q'*, tends to push the lead *l* outward. Other forms of marking-instrument may, however, be used, whether they be pens or pencils or marking-wheels.

In Figs. 10, 11, and 12 the marking-instrument is shown as in the form of a stylographic pen. In these views the extensible roller E E is shown as replaced by a bar or table, E', and the marking-instrument is carried by a holder, K', pivoted to the spindle M', free to turn in bearings *m* in the frame. The marking-instrument is nearly balanced by an adjustable counter-weight, *w*. To the outer end of the spindle M' is secured an arm, *m'*, acted on by a centrifugal device, C, driven by some moving part of the machine. A lug, *n'*, on a collar, *n*, secured to the spindle M', is adapted to act on a corresponding lug, *k'*, on the pivoted holder K', and the action of the centrifugal device is such that when the speed of the machine increases, the arm *m'* on the spindle M' will be pressed upward, and, through the medium of the lugs *n' k'*, the marking-instrument will be pressed down on the paper more firmly as the paper travels faster. The paper is kept down upon the table as it travels over the latter by means of spring-arms *v*, carrying anti-friction rollers.

I claim as my invention—

1. A paper-ruling machine comprising marking-instruments, a spindle for the roll of paper, a roller for the paper to travel over, and side frames, the latter being adjustable toward and from each other for ruling different widths of paper, substantially as set forth.

2. A paper-ruling machine having side frames carrying the marking-instruments and adjustable toward and from each other, an extensible spindle for the roll of paper, and an extensible roller for the paper to travel over, all substantially as described.

3. The combination of the extensible spindle and roller with the side frames carrying marking-instruments, diagonal braces connecting the side frames, and each brace having a bolt-and-slot connection with one of the frames, substantially as described.

4. The spindle for carrying the roll of paper, said spindle being provided with expanding mandrels at opposite ends, substantially as specified.

5. The spindle having at each end a wedge-collar, and a collar movable longitudinally on the spindle and carrying arms bearing on the wedge, all substantially as described.

6. The combination of a marking-instrument of a ruling-machine and a lever to press the instrument down on the paper with a centrifugal governor driven by some moving part of the machine and acting on the said lever, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB SCHUMACHER.

Witnesses:

WILLIAM D. CONNER,

HARRY SMITH.