

(No Model.)

2 Sheets—Sheet 1.

E. & A. SAMUEL.  
MACHINE FOR PRINTING FABRICS.

No. 453,362.

Patented June 2, 1891.

Fig. 1

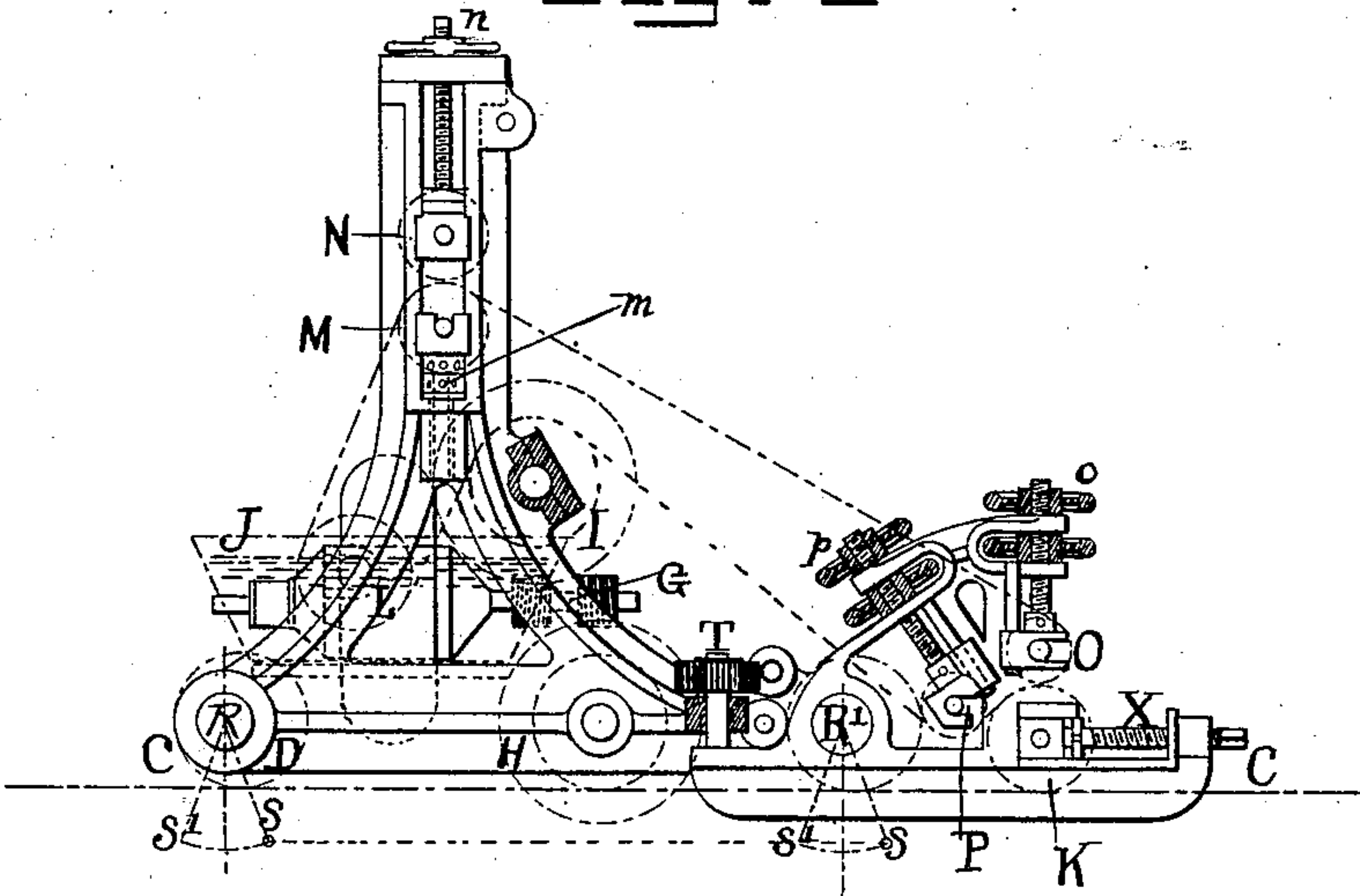
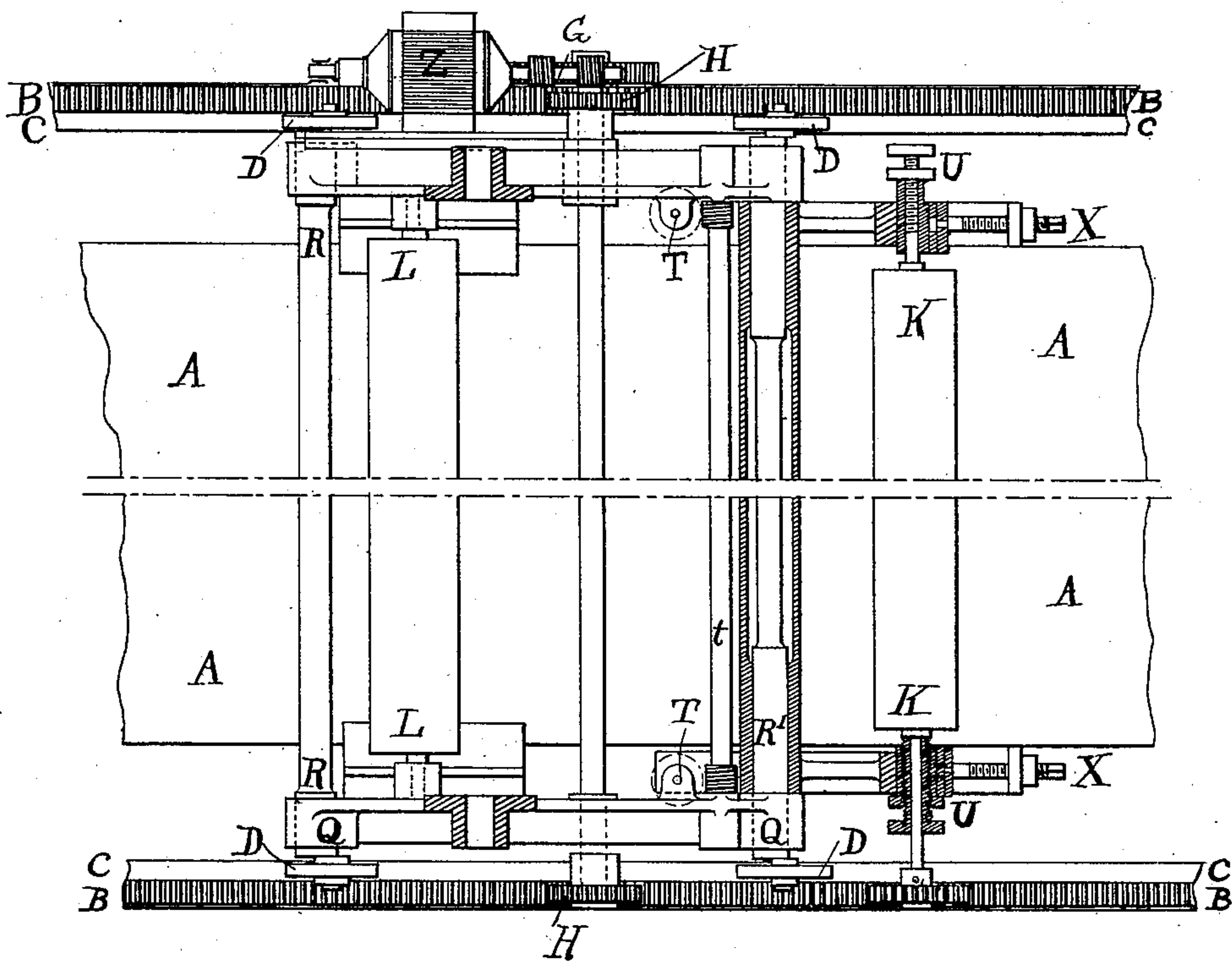


Fig. 2



WITNESSES:

John Revell  
George Baumann

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Emile Samuel and  
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BY  
Horsley and Horsley  
their ATTORNEYS

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

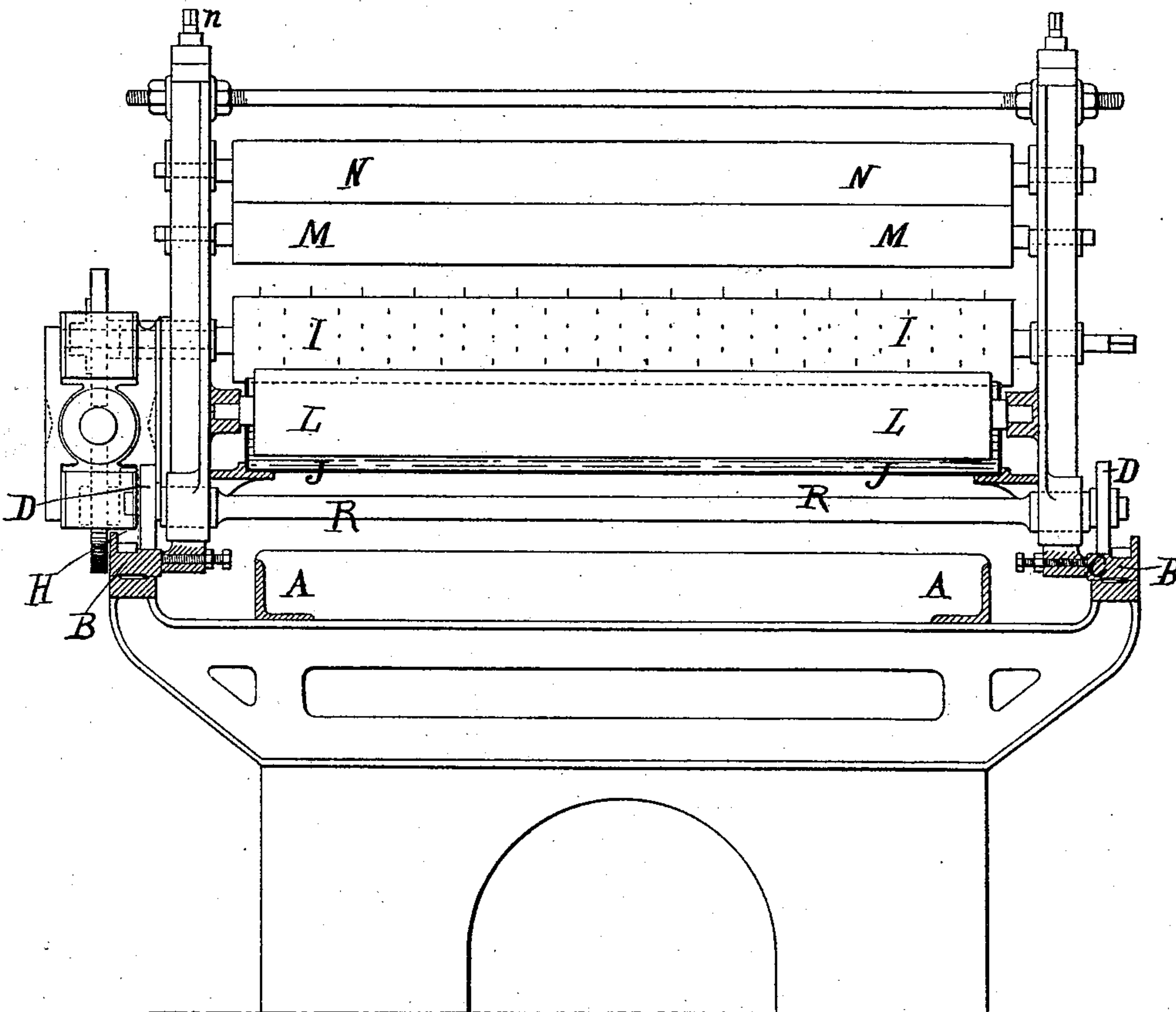
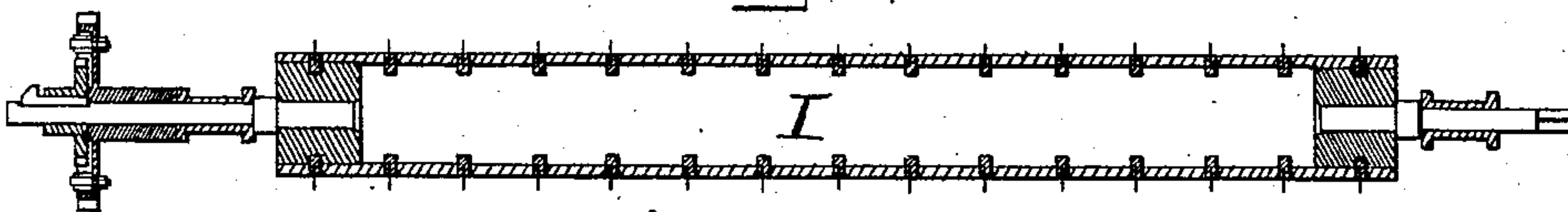


Fig. 4.



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# UNITED STATES PATENT OFFICE.

EMILE SAMUEL AND ANDRÉ SAMUEL, OF NEUVILLE, FRANCE.

## MACHINE FOR PRINTING FABRICS.

**SPECIFICATION** forming part of Letters Patent No. 453,362, dated June 2, 1891.

Application filed July 31, 1890. Serial No. 360,602. (No model.) Patented in France February 17, 1890, No. 203,822; in Germany February 25, 1890, No. 53,020; in England March 1, 1890, No. 3,301; in Spain September 9, 1890, No. 11,063, and in Italy September 30, 1890, No. 28,197.

*To all whom it may concern:*

Be it known that we, EMILE SAMUEL and ANDRÉ SAMUEL, trading as "La Société Samuel Cousins," of Neuville-sur-Saône, (Rhône,) in the Republic of France, have invented Improvements in Machines for Printing Fabrics, (for which we have obtained Letters Patent in France, No. 203,822, dated February 17, 1890; in Germany, No. 53,020, dated February 25, 1890; in Great Britain, No. 3,301, dated March 1, 1890; in Italy, No. 28,197, dated September 30, 1890, and in Spain, No. 11,063, dated September 9, 1890,) of which the following is a specification.

The printing-machine forming the subject of the present invention belongs to that class of machines in which the fabric is stretched upon a table and the mechanism carrying the printing-roller travels all along the fabric, which remains stationary upon the table.

In the accompanying drawings, Figure 1 represents the printing-machine in longitudinal elevation. Fig. 2 represents a plan of the same, and Fig. 3 a side elevation. Fig. 4 is a detail view.

The arrangement of this machine is as follows: The piece of fabric or material to be printed on in one or more colors is stretched beforehand, without folds or wrinkles, upon a table A, the horizontal surface of which is carefully leveled or adjusted so as to be truly parallel to the plane of two racks B, combined with planed or flat rails C on the right and left hand sides of the table A and extending from one end of the latter to the other.

The printing mechanism is constructed with two parallel vertical frames connected by transverse rods or bars and carrying sundry rollers in addition to the engraved or printing roller K, the said rollers being perfectly parallel to one another and perpendicular to the length of the table A. This printing mechanism is carried by four rollers or small wheels D rotating freely upon four eccentric journals Q on the ends of two shafts R R'. The rollers run on the rails C, and a double lever S enables these shafts R R' to be rotated through one-quarter of a revolution. When the lever is in the position S the rollers D are so placed as to enable the teeth

of the driving-pinions H to gear with the racks B. The machine is then in position for traveling forward in the direction of the arrow in order to perform the printing operation, the printing-roller K being in contact with the fabric. On the other hand, when the lever S is moved into another position S', the four rollers D are lowered relatively to the shafts R R', whereby the printing mechanism is then raised sufficiently to remove the pinions H out of contact with the racks and raise the printing-roller K out of contact with the fabric to be printed. The printing mechanism can then be freely shifted or moved backward or forward along the table, and the furnishing-cloth and printing-roller K can be moved, if required, in order to clean them or apply the colors. The printing-roller can also be brought accurately over the place on the fabric where the printing is to be recommenced in order to cover the whole of the piece. This peculiar arrangement of the rollers D also enables the printing mechanism to be thrown out of action instantaneously in case anything goes wrong with the machine. In fact, when the parts are in the elevated position described the whole machine is rendered inoperative and the printing mechanism cannot act even when the driving-shaft G rotates continuously. This motion may be imparted to the shaft G either by a crank or by a grooved pulley and endless cord, or by a small dynamo Z applied on the shaft, or by any other suitable driving mechanism.

First. The motion of the shaft G is transmitted by suitable gearing—such, for example, as an endless screw or worm and worm-wheel—to two pinions H, and thus communicates to the entire printing mechanism a traveling movement parallel with itself, carrying the said mechanism from one end of the racks to the other, and consequently over the entire length of fabric stretched on the table A. It is found that good work can be done with the machine even when the table A is traveled over at the rate of about thirty feet per minute. The rate of traveling motion is regulated by the speed of the shaft G.

Second. The movement of the shaft G is transmitted at the same time by other gear-



ing to the roller I, provided with pins (see Figs. 3 and 4) which engage with the endless cloth which carries the color from the trough J to the engraved roller K. This pin-roller I is of exactly the same diameter as the rollers D, these rollers being of a diameter equal to the original diameter or pitch-line of the pinion H, which, however, rotates in the opposite direction to the pin-roller I.

The axis of the printing-roller K is provided with a pinion H', which gears with the same rack B as the pinion H. The printing-roller may be of any diameter; but it is necessary that the pinion H' be of exactly the same diameter, otherwise this roller K would slide on the table. Moreover, it is necessary that the teeth on the pinion H' should be separated from each other by a distance equal to the step of the rack, therefore the circumference of the pinion H, and in consequence the circumference of the printing-roller K, ought to be a multiple of the step of the rack. By means of this arrangement the surface of the roller K travels over the fabric when the printing mechanism is working without any slip or friction of its engraved surface, either at the part of the said surface in contact with the fabric or at the part in contact with the furnishing-cloth.

The printing mechanism is capable of working with a large number of engraved rollers of very different diameters, as the peripheral speed of these rollers is invariably equal to the speed at the periphery of the traveling wheels or rollers D, and to that of the driving or pin roller I, which is the same. The endless cloth which transfers the color passes over the rollers I L M N O P. The roller L draws the cloth under the color in the trough J. The rollers M N, adjusted by means of screws with adjusting-nuts *m n*, enable the tension of the cloth to be regulated and serve to produce a squeezing action which regulates the quantity of color to be supplied by causing the excess to fall back into the trough. The axes of the rollers O P are carried by sliding bearings adjusted by screws with adjusting-nuts *o p*, enabling the furnishing cloth to be put properly in contact with the printing-roller K.

The hinder end of the printing mechanism carrying the printing-roller K and the two cloth-rollers O P is constituted by one casting vibrating on the shaft R'. Stop-screws T limit the amplitude of its vibration and prevent the engraved roller K from touching the table A or the fabric thereon when the printing mechanism is raised by means of the eccentric journals of the traveling wheels D.

The adjusting-screws T can be quickly ad-

justed by means of a transverse shaft *t* with two worms. This shaft may be provided with a slide or indicator showing accurately the positions that may be occupied by the two adjusting screws or stops T. During the normal working the weight of the frame carrying the printing-roller K, and the furnishing-cloth rollers O P allows the printing-roller K to rest freely on the fabric to be printed and thus accommodate slight irregularities in the surface of the table or of the fabric without being moved out of contact with the furnishing-cloth. There is consequently no danger of too little color or too much color being supplied, as the printing-roller always exerts the same amount of pressure on the fabric and retains the same contact with the furnishing rollers or cloth. This arrangement of the printing-roller constitutes the second important feature of the invention.

The pressure of the printing-roller K on the fabric can be diminished by raising both the rollers M N. This increases the tension of the furnishing-cloth which raises the rollers O P, and consequently the frame carrying both these rollers and the printing-roller K. The pressure may be increased by adding weights in any suitable manner. The printing-roller K is brought accurately into its proper position with precision by the aid of screw-stops X being adjusted transversely by screwed sleeves U. As many printing-machines may be employed as there are colors, or one machine may be caused to apply all the different colors in succession, all the parts being readily accessible for cleaning.

We claim as our invention—

1. In printing-machines, the combination of a movable frame-work to carry the printing mechanism, with a frame pivoted thereto and carrying the printing-roller and guide-rolls for the furnishing-cloth, for the purposes set forth.

2. In printing-machines, the combination of a movable frame-work provided with printing mechanism, with wheels upon which the frame-work travels, pinions for moving the frame-work, and a needled roller for moving the furnishing-cloth, the said wheels, pinions, and needled roller being of the same diameter, and racks upon which the pinions travel, as and for the purposes described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

EMILE SAMUEL.  
ANDRÉ SAMUEL.

Witnesses:

VICTOR MILLET,  
CH. DESGAULTIERE.