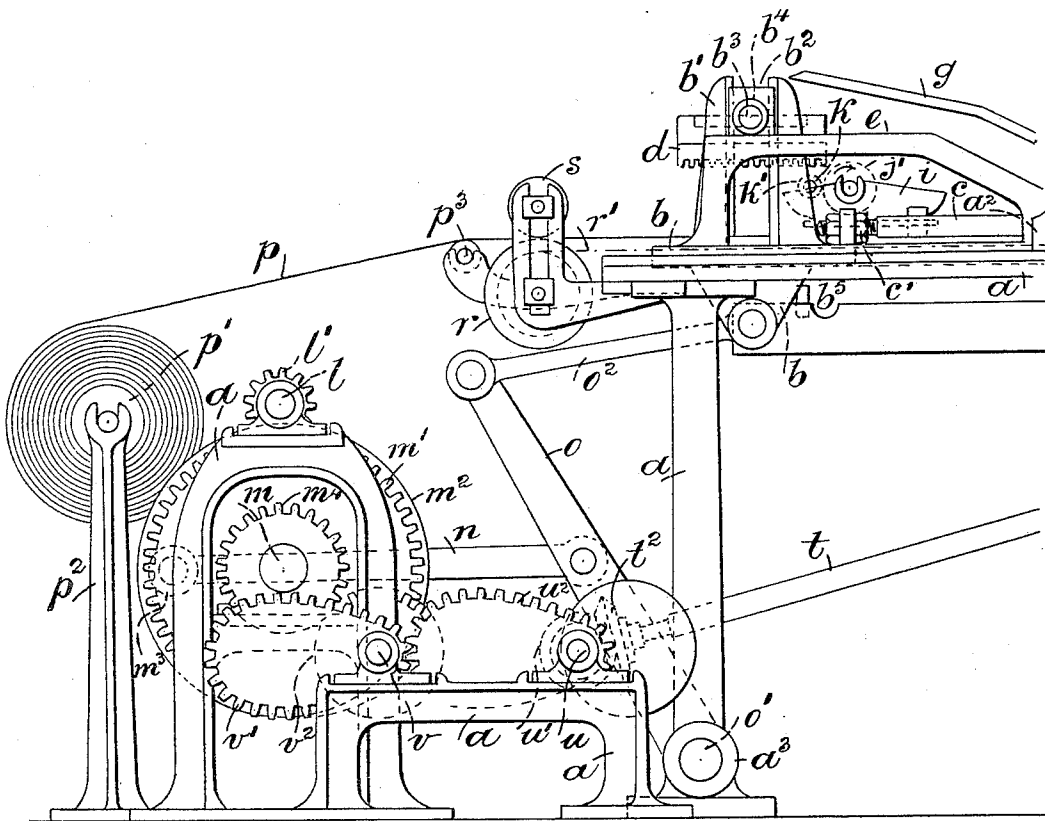


6 Sheets—Sheet 1.

MACHINE FOR PRINTING OR EMBOSSING FABRICS.

Patented June 21, 1892.

FIG. 1.



INVENTOR:

James Farmer.

 B_y

ATTORNEYS.

(Model.)

6 Sheets—Sheet 2.

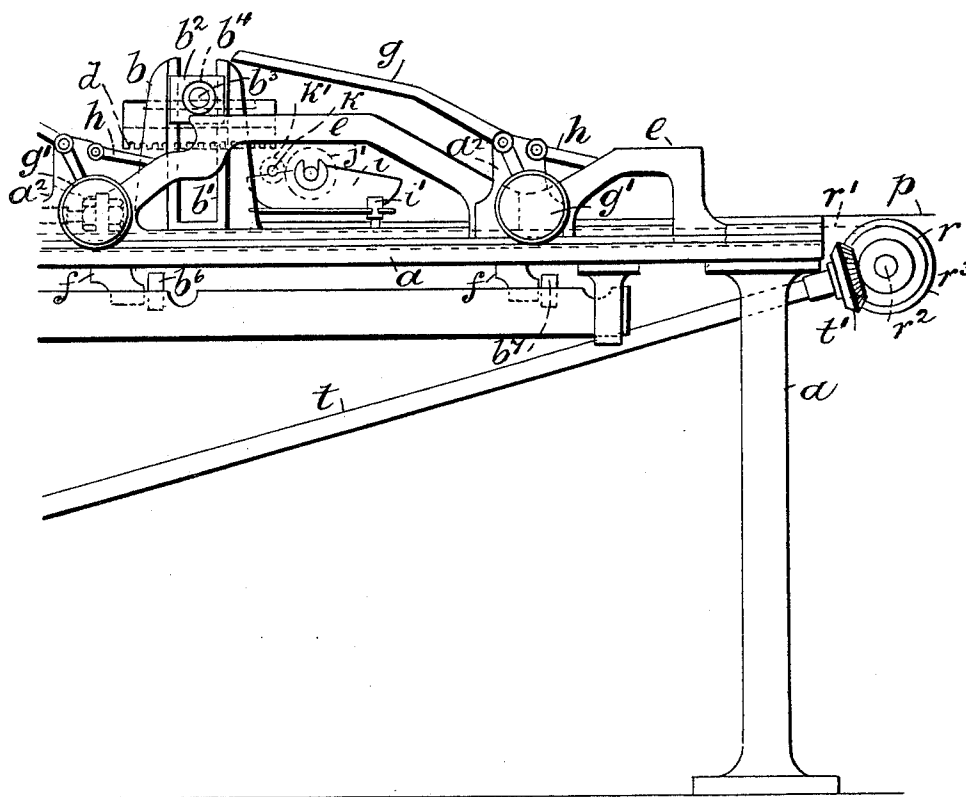
J. FARMER.

MACHINE FOR PRINTING OR EMBOSSING FABRICS.

No. 477,205.

Patented June 21, 1892.

FIG. 1.^a



WITNESSES:

Howard L. White.
H. de Vos.

INVENTOR:

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Attorneys.

Richardson

(Model.)

6 Sheets—Sheet 3.

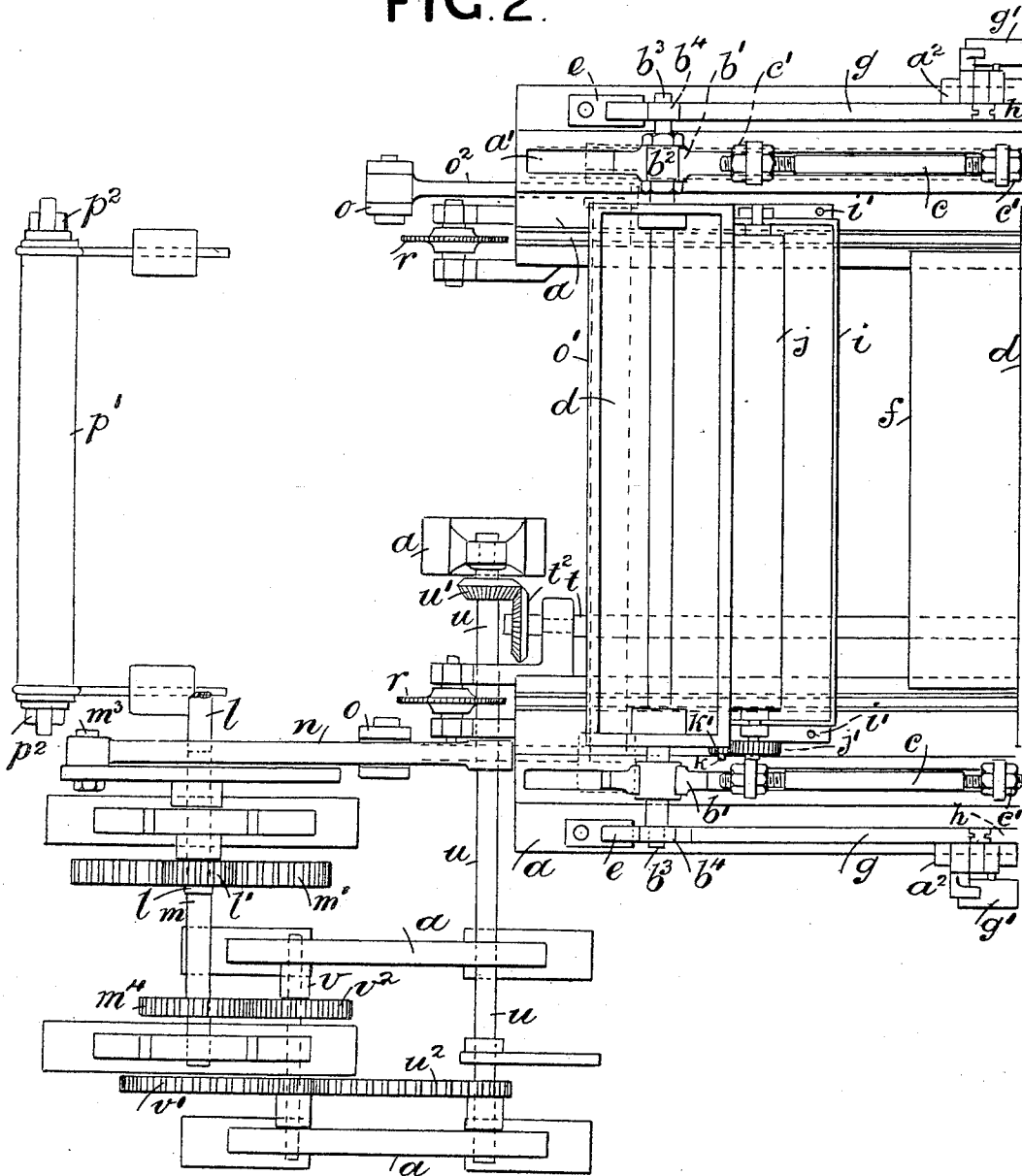
J. FARMER.

MACHINE FOR PRINTING OR EMBOSSEING FABRICS.

No. 477,205.

Patented June 21, 1892.

FIG. 2.



WITNESSES:

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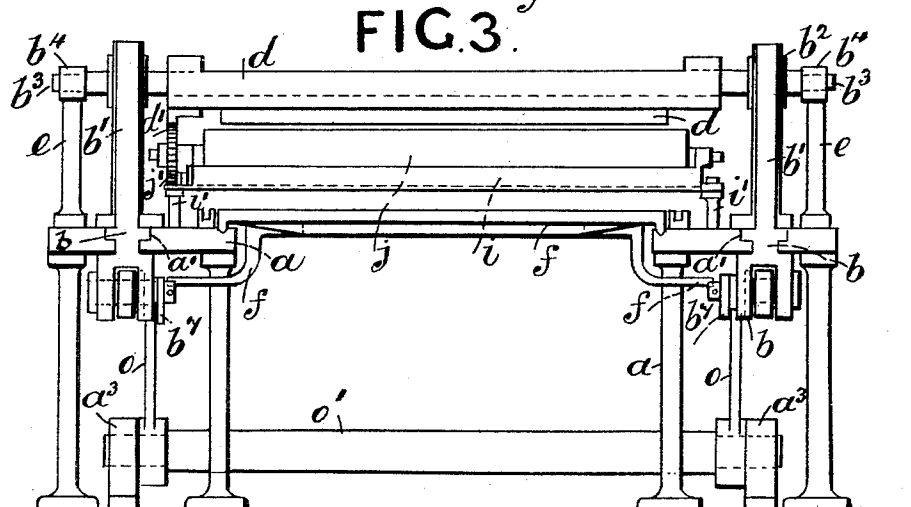
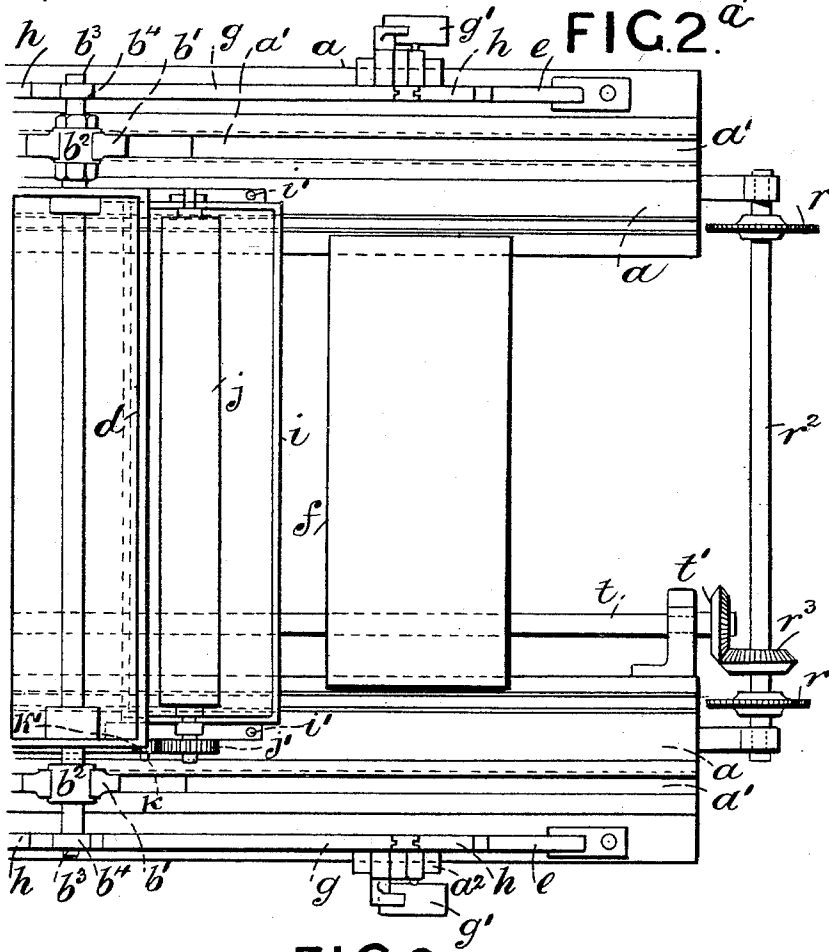
6 Sheets—Sheet 4.

J. FARMER.

MACHINE FOR PRINTING OR EMBOSSING FABRICS.

No. 477,205.

Patented June 21, 1892.



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6 Sheets—Sheet 5.

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MACHINE FOR PRINTING OR EMBOSSEING FABRICS.

No. 477,205.

Patented June 21, 1892.

FIG. 4.

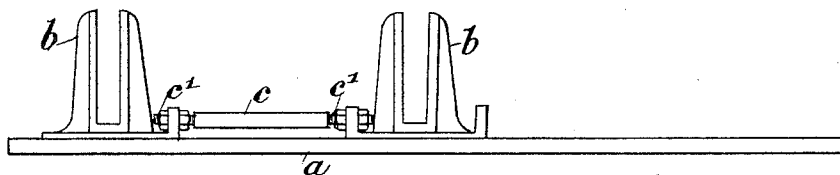


FIG. 5.

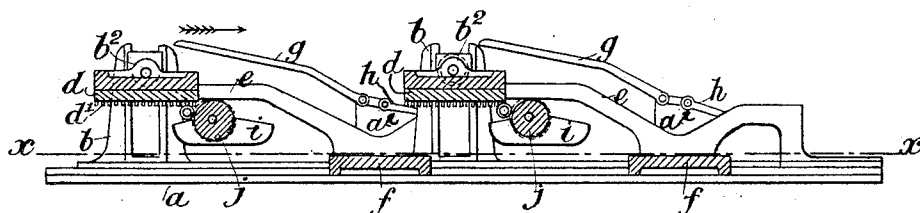


FIG. 6.

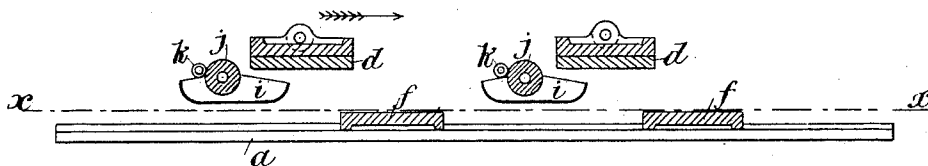


FIG. 7.

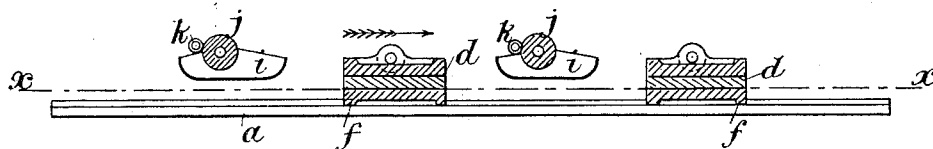
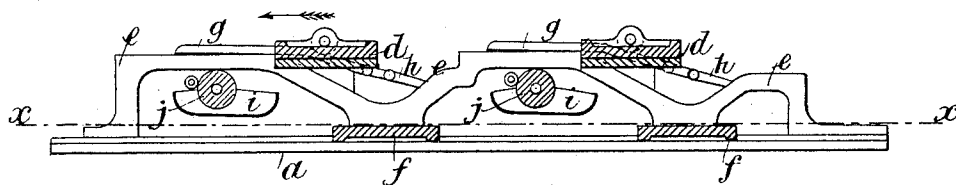


FIG. 8.



Inventor:

Witnesses:

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(Model.)

6 Sheets—Sheet 6.

J. FARMER.

MACHINE FOR PRINTING OR EMBOSSING FABRICS.

No. 477,205.

Patented June 21, 1892.

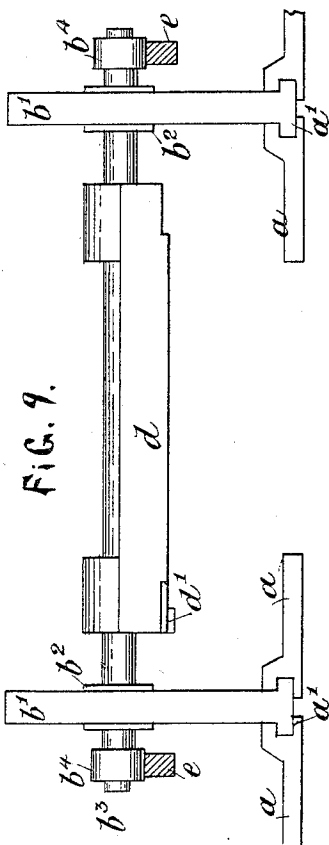


FIG. 9.

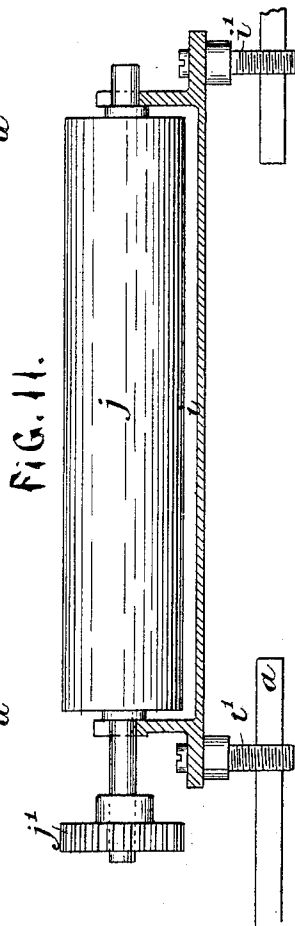


FIG. 11.

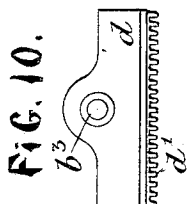


FIG. 10.

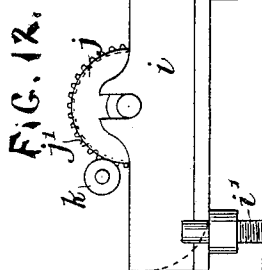


FIG. 12.

Witnesses:

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E. H. Stuart.

Inventor:

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By

Richardson
his Attorneys.

UNITED STATES PATENT OFFICE.

JAMES FARMER, OF SALFORD, ENGLAND.

MACHINE FOR PRINTING OR EMBOSSING FABRICS.

SPECIFICATION forming part of Letters Patent No. 477,205, dated June 21, 1892.

Application filed September 16, 1889. Serial No. 324,166. (Model.) Patented in England January 12, 1889, No. 603.

To all whom it may concern:

Be it known that I, Sir JAMES FARMER, a subject of the Queen of Great Britain, residing at Salford, in the county of Lancaster, England, have invented certain new and useful Improvements in Machinery for Printing or Embossing certain Fabrics and Materials, (for which I have obtained Letters Patent in Great Britain bearing date January 12, 1889, No. 603,) of which the following is a specification.

My present invention consists in certain improvements on the invention for which I obtained Letters Patent in the United States, No. 408,913, dated August 13, 1889, and in Great Britain, numbered 10,431, dated July 27, 1887, and entitled "improvements in and machinery for printing floor-cloths and textile and other fabrics and materials and also for embossing certain materials or fabrics."

The objects of my present improvements are to improve the mechanism for actuating the printing-blocks and the arrangement for inking the same. I attain these objects by the mechanism illustrated by the accompanying sheets of drawings, in which—

Figures 1 and 1^a represent a side elevation, Figs. 2 and 2^a a plan, and Fig. 3 an end elevation, of a two-color printing-machine—that is, a printing-machine provided with two separate color-boxes and printing-blocks, each box having a different color—to which my improvements have been applied. Fig. 4 shows the inking-roller appliance. Fig. 5 is a longitudinal section of a two-color machine, all unnecessary parts omitted. Figs. 6 and 7 show the printing-blocks *d* at different times in the forward stroke, as indicated by the arrows. Fig. 8 shows the blocks *d* on their return stroke when they are supported and travel back upon the lever *g* above the inclined rails *e* and clear of the inking-roller. Figs. 9 and 10 represent side and end views of one of the printing-blocks *d*. Figs. 11 and 12 represent the inking-roller *j* and the color-box *i*, with the screws by which it can be adjusted vertically.

Referring to the drawings, *a* designates the main frame of the machine.

b b are two frames mounted in slideways *a'* (see Fig. 3) on the frame *a* and coupled together adjustably by screwed connecting-rods

c and nuts *c'* or equivalent connections, so that the distance apart of the two frames *b* can be regulated as required. To these combined frames *b* a sliding reciprocating movement to and fro on the main frame *a* is imparted by the mechanism shown and hereinafter described or by any other suitable and convenient arrangement. Each of the sliding frames *b* has a standard *b'*, in which is a slide-way fitted with a slide-block *b²*, and each pair of slide-blocks *b²* on opposite sides of the machine carry one of the printing-blocks *d*. On a shaft extending across the machine or on a trunnion *b³*, secured to or formed with each sliding block *b²*, is mounted an anti-friction roller *b⁴*, which runs on a guide-rail *e*, fixed on the main frame *a*. These guide-rails *e* for a certain length beyond each block *d* lie in a horizontal plane and then dip down and rise again in a curve to a horizontal plane, as shown best in Fig. 1. Below the bottom of each dip or curve in the guide-rails *e* is placed a sliding table *f*, to which a reciprocating motion is imparted at a certain time as and by the means hereinafter described. To a bracket *a²* on the framing and above the center of each dip in the guide-rails *e* are pivoted an elbow-lever *g* on the side nearest the first block *d* and a short lever *h* on the other side. The long arm of each lever *g* is kept normally raised, as shown in Fig. 1, by means of a weight *g'* or by a spring, while each short lever *h* is kept by its own weight normally lowered in a horizontal or approximately-horizontal plane. Between each printing-block *d* and dip in the guide-rail is placed a color-box *i*, which is vertically adjustable by means of screws *i'*, and in each color-box is mounted a color-roller *j* and a doctor-roller *k*. On each color-roller *j* is fixed a pinion *j'*, gearing into a pinion *k'* on the doctor-roller *k* and on each forward stroke of the sliding frames *b*, while the rollers *b⁴* are running on the guide-rails *e*, racks *d'*, fixed on the under side of the printing-blocks *d*, gear into the pinions *j'*, and so drive both the color-rollers *j* and doctor-rollers *k*. On the return stroke of the sliding frames *b'*, while the rollers *b⁴* are running on the upper side of the elbow-levers *g*, as subsequently explained, the racks *d'* pass over without driving the

pinions j' , so that the color-rollers j and doctor-rollers k remain stationary until the next forward stroke of the sliding frames b .

The mechanism for imparting a reciprocating movement to the sliding frames b in the arrangement shown consists of the following parts: The driving-shaft l carries a pinion l' , which gears into and drives a spur-wheel m' , fixed on a shaft m , on which is also fixed a disk m^2 , with an eccentric-pin m^3 connected by a link n to one of two rocking levers o , which are fulcrumed and fixed on a rocking shaft o' , supported in bearings a^3 in standards of the frame a . The upper ends of the rocking levers o are connected by links o^2 to the sliding frames b , so that as the disk m^2 revolves and the eccentric-pin m^3 thereon by the link n rocks the levers o a reciprocating motion is imparted by the links o^2 to the sliding frames b , which are thus traversed to and fro in the slideways a' . On the sliding frames b at each side are fixed three pairs of adjustable catches or stops $b^5 b^6 b^7$, respectively, and when the sliding frames b are moving forward the pairs of stops $b^5 b^6$ come in contact with and carry forward for a certain distance the sliding tables f , while on the return stroke the sliding tables f are moved backward by the pairs of stops $b^6 b^7$.

The floor cloth or fabric p to be printed is batched upon a roller p' , supported in standards p^2 , and the fabric is traversed through the machine at the varying speeds necessary to insure good printing, preferably by means of a traveling chain r' on either side of the machine. These chains r' , which have needle-points, extend from end to end of the machine, and are mounted upon chain-wheels r , which are supported on the framing a . The fabric p passes from the batch-roller p' over a guide or roller p^3 , which extends across the width of the machine, and is pressed onto the needle-points of the chains r' at each edge by means of brushes s , which are fixed one above each of the first pair of chain-wheels r . The second pair of chain-wheels r are fixed upon a shaft r^2 , upon which is also fixed a bevel-gear r^3 , which is driven by a bevel-gear t' , fixed upon a shaft t . On the other end of this shaft t is fixed a bevel-gear t^2 , which is driven by a bevel-gear u' on a shaft u , on which is also fixed adjustably an elliptical gear u^2 , which is driven by another elliptical gear v' , fixed on a shaft v . The shaft v also has fixed upon it a spur-wheel v^2 , which is driven by a spur-wheel m^4 , fixed on the shaft m , which receives motion from the driving-shaft a , as before described. As the chains r' and chain-wheels r are driven from the shaft m , which drives the sliding frames b with the printing-blocks d and the said frames b also actuate the sliding tables f , it will be readily understood that by adjusting axially the relative positions of the elliptical gears u^2 and v' I can insure the fabric p traveling at the exact speed required at the moment of printing.

The operation of the machine is as follows:

As the rocking levers o oscillate and the combined sliding frames $b b$ begin to move forward, each printing-block d passes over and is inked by its color-roller j , which is caused to rotate while the printing-block passes over it by means of the rack d' and gears, as described. After the printing-blocks d leave their respective color-rollers j they pass under the raised long arms of the pivoted elbow-levers g , and leaving the horizontal portions of the guide-rails e they descend the curves and print the fabric p upon the sliding tables f , which at that moment are caused to move forward with the sliding frames b by means of the pairs of stops $b^5 b^6$, as before described. The fabric also being drawn forward by the chains r' , which at the moment of printing are driven at exactly the same speed as that at which the printing-blocks d are moving, it follows that the printing-blocks d , the fabric p , and the sliding tables f all travel forward together at exactly the same speed. Immediately the fabric has been printed the printing-blocks d begin to leave the sliding tables f as they ascend the opposite sides of the curves in the rails e , and then rising and passing under the second pairs of pivoted levers h they again arrive on horizontal portions of the guide-rails e , but on the opposite side of the curves from that on which they started, the letters h falling down again after the rollers b^4 have passed. The rocking levers o now begin to move in the reverse direction, and as the sliding frames b , with the printing-blocks d , return the rollers b^4 run on the upper side of the pairs of pivoted levers h and g , the levers g being pressed down into the required position by the rollers b^4 passing over them. During the greater portion of the return movement of the sliding frames b the sliding tables f remain stationary; but a little before the rollers b^4 leave the levers g and come again onto the surface of the guide-rails e the stops $b^6 b^7$ catch the tables f and push them back to their initial positions, ready for the next printing stroke.

Although for convenience of description I have specified my invention as applied to a two-color printing-machine, it is obvious that my improvements are equally applicable to a single-color printing or embossing machine and also to machines with three or more printing-blocks.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of a main frame a , frame b , arranged to reciprocate thereon, printing-blocks d , mounted in vertical slideways in said reciprocating frame and supported by rollers b^4 , arranged to run on guide-rails e , said rails being formed with rises and dips to guide the printing-blocks d over and in contact with the fabric p , the pivoted levers $g h$, and the inking device, substantially as set forth.

2. The combination, with the reciprocating frame *b*, of vertical sliding printing-blocks *d*, mounted thereon, the guide-rails *e* and pairs of levers *g h*, pivoted to the brackets *a*² on the framing for supporting the printing-blocks *d*, the sliding frames *b*, with standards *b'*, the slide-blocks *b*², carrying the printing-blocks *d*, the trunnions *b*³ and the anti-friction rollers *b*⁴, which run on guide-rails *e* and secured to blocks *b*², and the inking device, substantially as set forth.

3. The combination, with the guide-rail *e*, of the pairs of pivoted levers *g h*, pivoted to bracket *a*², the weights *g'*, keeping lever *g* normally raised, levers *h*, the color-boxes *i*, having screws *i'*, said boxes located between printing-blocks *d* and the dip in guide-rail *e*, the rollers *j* and *k* being mounted in color-boxes *i*, and the pinions *j'* and *k'*, fixed to the rollers, substantially as herein set forth.

4. The combination of the driving-shaft *l*, carrying pinions *l'*, spur-wheel *m'* on shaft *m*, driven by pinion *l'*, the disk *m*², fixed on shaft *m* and having an eccentric-pin *m*³ connected by link *n* to rocking levers *o*, fixed on rock-

ing shaft *o'*, supported in bearings *o*³ in frame *a*, and the sliding frame *b*, having fixed at each side the pairs of adjustable catches *b*⁵, *b*⁶, and *b*⁷, substantially as herein set forth.

5. The combination, with roller *p'* in standard *p*², of the traveling chain *r'*, with needle-like points mounted on chain-wheels *r*, supported on frame *a*, the rollers *p*³, the brushes *s*, fixed to chain-wheels *r*, the shaft *r*², having bevel-gear *r*³ thereon, and driving bevel-gear *t'*, fixed on shaft *t*, the bevel-gear *t*², driven by bevel-gear *u'* on shaft *u*, the elliptical gear *u*², fixed thereto and driven by elliptical gear *v* on shaft *v'*, and spur-wheels *v*², driven by spur-wheels *m*⁴ on shaft *m*, substantially as herein set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JAS. FARMER.

Witnesses:

H. B. BARLOW,

S. W. GILLET,

Both of St. Ann's Square, Manchester, England.