

(No Model.)

J. L. DAVIES.

3 Sheets—Sheet 1.

MULTICOLOR PRINTING MACHINE.

No. 515,821.

Patented Mar. 6, 1894.

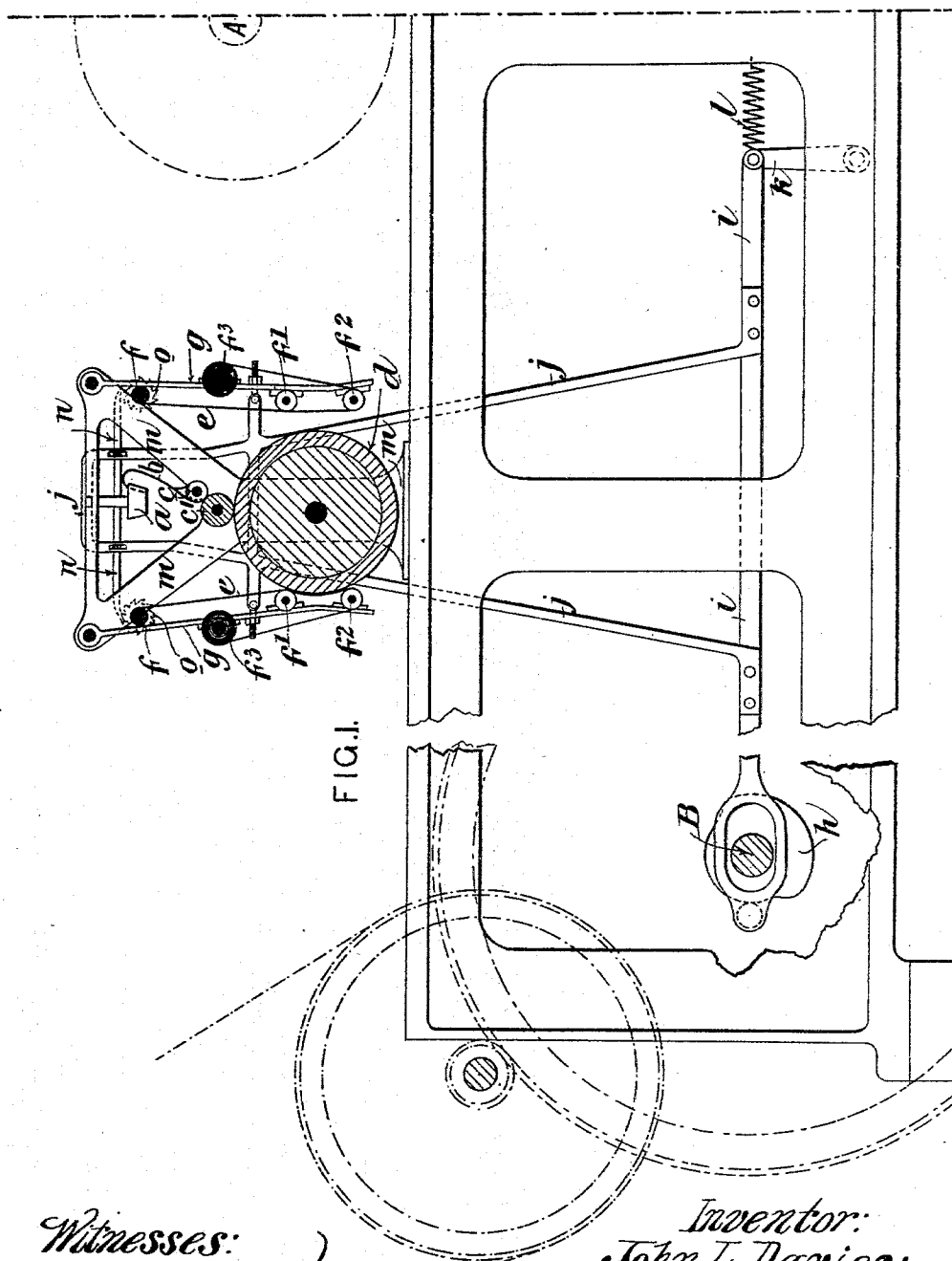


FIG. 1.

Witnesses:
H. G. I. Wieterich
Henry Orth

Inventor:
John L. Davies:
By Henry Orth
Atty:

(No Model.)

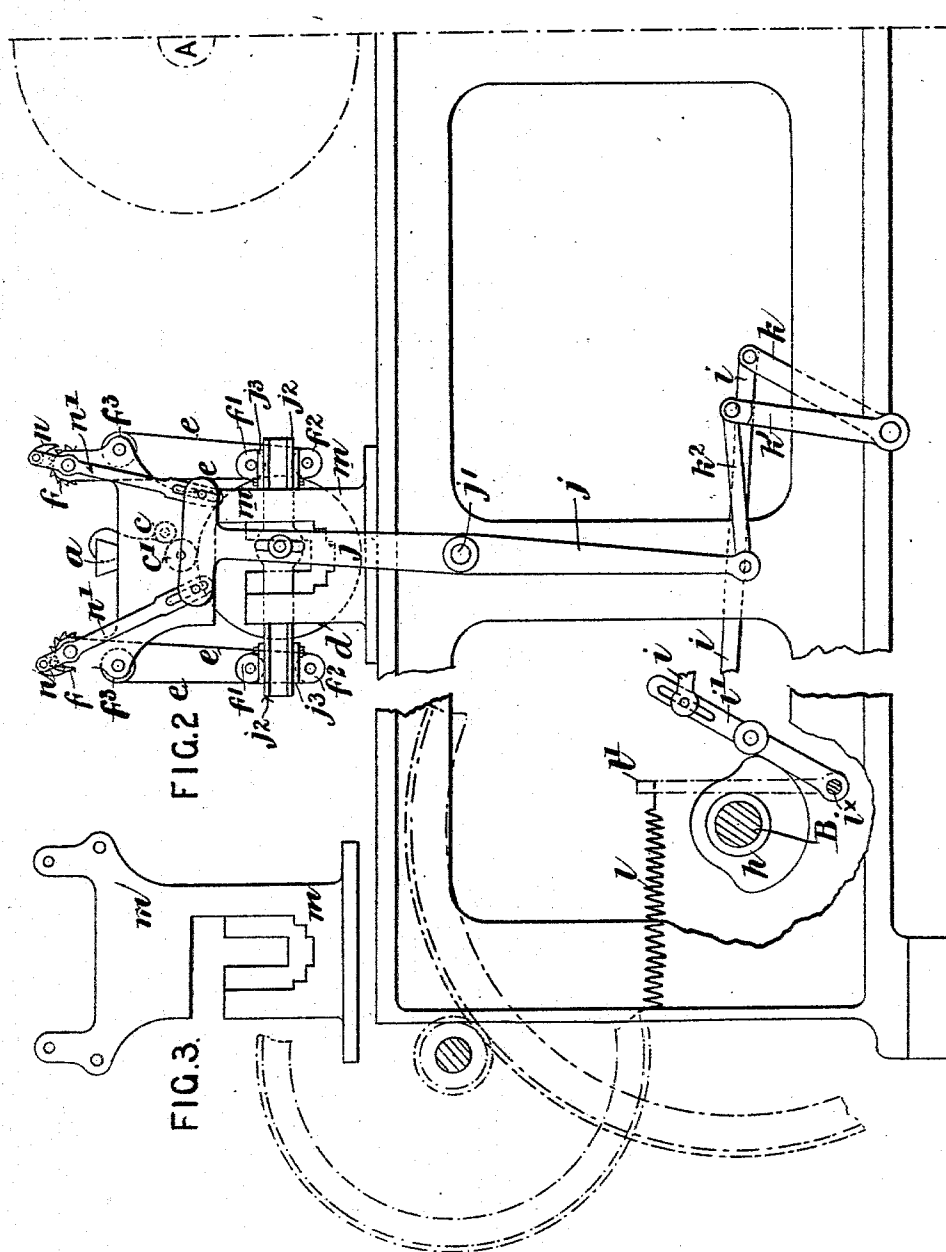
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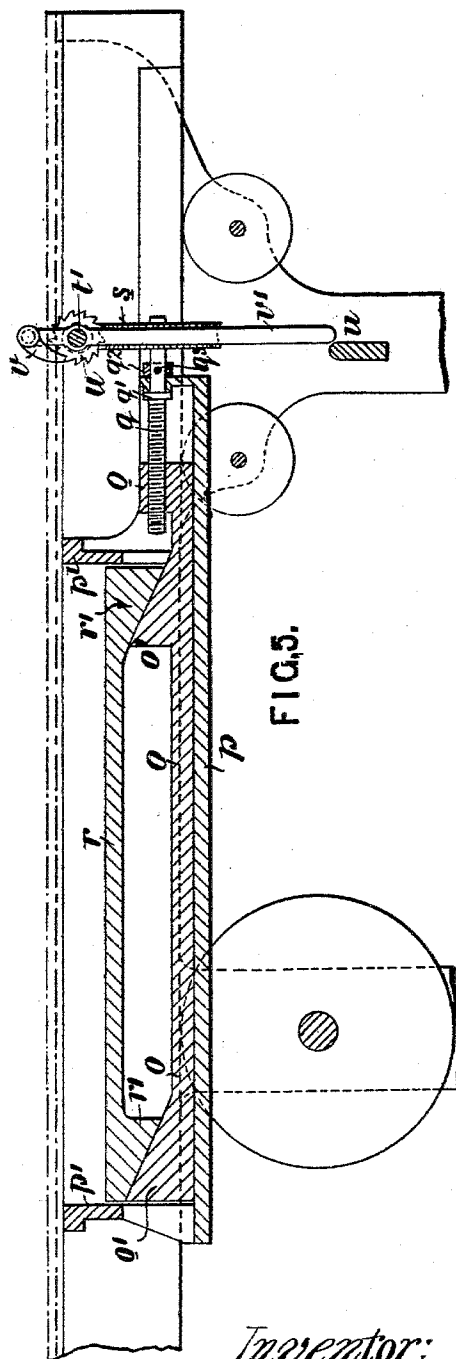
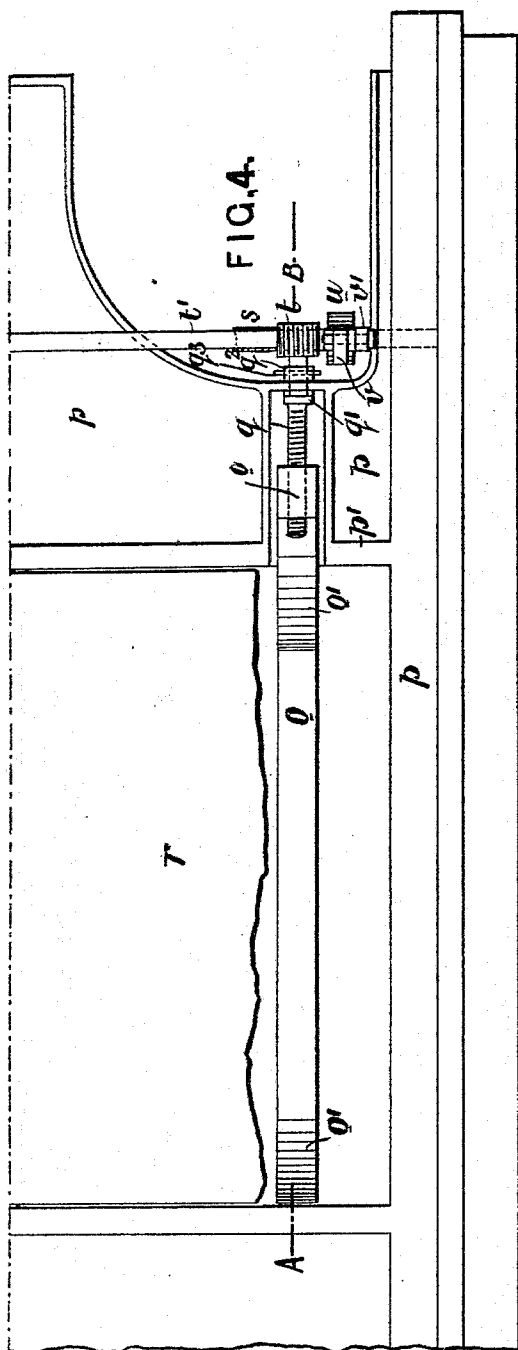
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UNITED STATES PATENT OFFICE.

JOHN LACEY DAVIES, OF LONDON, ENGLAND.

MULTICOLOR-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,821, dated March 6, 1894.

Application filed September 30, 1893. Serial No. 486,847. (No model.)

To all whom it may concern:

Be it known that I, JOHN LACEY DAVIES, a subject of the Queen of Great Britain, residing at Chipstead, London, in the county of Surrey, England, have invented new and useful Improvements in Multicolor-Printing Machines, of which the following is a specification.

This invention applies to color printing machines in which the color or colors to be used are formed in a dry solid block the surface of which for each impression is moistened with turpentine or other solvent so that a thin film of color may be transferred or conveyed from the block to the paper to be printed.

The invention is applicable to existing color printing machines of this kind, and also to ordinary lithographic machines or other similar or analogous machines so as to adapt them to this kind of color printing.

The color block is according to my invention moistened with turpentine or other suitable solvent by means of a roller which I call a solvent roller working over and in intermittent contact with the color block and having its upper part supplied with the turpentine by contact with one or more rollers receiving supply of turpentine from a piece of flannel or the like which dips into a turpentine supply vessel. By this capillary action an even and constant sufficient amount of turpentine is supplied to the roller and thence to the block. But in order to insure sufficient action I have found that the solvent roller must be intermittently wiped clean in certain parts, that is to say on alternate sides, by means of a wiping cloth on each side, which cloths are also moved so as to present a fresh surface each time. The cloths are by preference of some length, coiling off one roller and on to another, and mounted in frames which receive vibrating or reciprocating motion so that one cloth is acting against the side of the solvent roller while the other is off. The color block is placed on a reciprocating traveling bed and has to be raised automatically in order to compensate for the thin layer of color removed from the block at each run of the machine. This I prefer to

effect by means of inclined planes under the color block in combination with worm and worm wheel gearing whereby an even accurate action is insured and good impressions are obtained.

Figure 1 of the drawings is a part sectional side view of an ordinary lithographic machine adapted to this kind of color printing. Figs. 2 and 3 show a modification of the same. Figs. 4 and 5 show in plan and in a vertical sectional view, the means for raising the color block.

A represents the ordinary printing cylinder and B the main driving shaft. The turpentine or other solvent is contained in the supply vessel *a* and is by a piece of flannel *b* or the like and by the rollers *c* and *c'* evenly supplied to the upper part of the solvent roller *d*. The sides of the latter are alternately wiped clean by means of a cloth *e* on each side. The freshly supplied turpentine in this manner does not come in contact with the soiled parts of the wiping cloths, which are passed over guide rolls *f f' f² f³*, the two sets of rolls being mounted in frames *g* which by a cam *h* on the driving shaft B and by the rod *i* with frame *j* are vibrated so that one cloth is acting against the solvent roller *d* while the other is off. The rod *i* is supported by the lever *k* and held up to the cam by the spring *l*. Each cloth is at the same time at each vibration by means of the double ended pawl *n* acting on one or other of the ratchet wheels *o* shifted round the guide rollers *f f' f² f³* thus each time presenting a clean fresh piece of wiping surface, the pawl *n* is free to rise and fall relatively to the frame *g*, the pawl having near each end a pin working freely in a short slot in the frame *g*. The cloths *e* are coiled off the rollers *f* and coiled on to the rollers *f³*. The swinging frames *g* and the solvent vessel *a* are supported on the machine framing *m*. It will be noticed that the connections between the vibrating frame *j* and the frames *g g* are flexible or jointed to allow for a slight rise and fall of the swinging frame *j*.

Fig. 2 is a side view of another arrange-

ment in which the cam *h* acts against the lever *i'* that is adjustably connected to the rod *i*; the lever *i'* works on the same fulcrum pin *i^x* as the lever *l'* to which the retractile spring *l* is connected. The rod *i* is at the other end supported by the lever *k* and on the fulcrum pin of the latter is fixed a lever *k'* which by connecting rod *k²* vibrates the lever *j* around the pin *j'*. Laterally reciprocating motion is imparted from a pin on the lever *j* to a slide *j²* which is guided on the plumber block or frame *m* for the solvent roller *d*. To each end of the slide *j²* is clamped or adjustably fixed a block *j³* with guide rollers *f'* and *f²* for the cloths *e* which coil off the rollers *f³* and coil on to the rollers *f*. The rollers *f* and *f³* are mounted on the framing or plumber block bracket *m*. The pawl motion for shifting the cloths *e* is effected from the upper hammer headed end of the lever *j* by means of the rods *n'* adjustably connected thereto and by the pawls *n*. The plumber block *m* is as shown in the detail view Fig. 3 so constructed that the solvent roller with its gudgeons can be lifted and laterally withdrawn without removing any other parts except the blocks *j³* which carry the rollers *f'* *f²*.

Obviously the means for imparting vibrating motions and for shifting the cloths to present new wiping surfaces to the solvent roller may be of many different forms.

Fig. 4 is a half plan and Fig. 5 a vertical longitudinal section of the means for automatically raising the color block. The latter rests on a plate *r* contained within four up-standing walls *p'* of the traveling bed *p*. The under side of the plate *r* is provided with sloping parts or faces *r'*, below which are provided slides *o* with corresponding slopes *o'*. The screws *q* are screw threaded in lugs on the slides *o* and have their other ends held each against longitudinal displacement in lugs on the traveling bed *p* by means of flange *q'* and collar *q²* with through pin *q³*. On the ends of the screws *q* are fixed worm wheels *s* into which gear the worms *l* on the spindle *t'* which also carries a pawl wheel *u* that is actuated intermittently by the pawl *v* and ratchet lever *v'* each time the latter in the travel of the bed *p* comes against the stop *w* on the framing of the machine. The color block resting on the intermediate slope plate *r* will thus at each run of the machine or travel of the bed *p* by reason of the turning of the screws *q* be raised to the very slight extent required, that is to say according to the layer of color removed from the color block.

By the aforesaid improvements the art of block color printing is materially furthered so that I am enabled to print direct from the color block on to the paper without the intervention of the usual cylinder which transfers the color from the block to the paper which latter encircles another cylinder. This bene-

ficial result is obtained by the efficient means for moistening the color block and for raising it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In machines for printing from a color block on a traveling reciprocating bed a solvent roller over and in intermittent contact with the color block, in combination with a vessel for supply of turpentine or other color solvent, a flannel dipping therein and conveying turpentine therefrom by capillary action and a roller moistened by the flannel and which is in contact with the solvent roller whereby the latter conveys turpentine in a suitable even manner to the color block at each "run" of the machine, a cloth on each side of the solvent roller, means for bringing them alternately in contact with said roller for wiping its sides, means for shifting the cloths intermittently so as to present a fresh wiping surface each time, and means for automatically raising the color block at each run of the machine to the extent of the thin layer of color removed by each printing operation, substantially as set forth.

2. In machines for printing from a color block on a traveling reciprocating bed, a solvent roller *d* over and in intermittent contact with the color block, in combination with a turpentine supply vessel *a*, a roller *c*, a flannel dipping in the vessel *a* and conveying turpentine by capillary action to the roller *c*, a roller *c'* in contact therewith, and with the solvent roller *d*, cloths *e* one on each side of the latter, rollers *f'* *f²* *f³* for supporting said cloths, means for supporting said rollers, means for bringing the rollers *f'* *f²* with the part of the cloths between them alternately up against and away from the sides of the solvent roller *d*, pawl gear for shifting such parts of the cloths at each run, mechanism for operating such gear from a working part of the machine, and means for automatically raising the color block at each run to the required extent substantially as set forth.

3. In machines for printing from a color block on a traveling reciprocating bed the solvent roller *d* in combination with means for supplying its upper part with turpentine by capillary feed action, the plumber block *m*, the rollers *f'* and *f³* mounted thereon with pawl wheels and pawls *n* and rods *n'* and suitable mechanism for intermittently actuating them from a moving part of the machine, the cloths *e*, the slide *j²* with cloth stretching rollers *f'* *f²* mounted thereon, a slot in the plumber block *m* for the slide to work in, means for bringing the rollers *f'* *f²* with the part of the cloths *e* between them alternately up against and away from the sides of the solvent roller and means for automatically raising the color block at each run to the required extent substantially as set forth.

4. In machines for printing from a color

block the traveling reciprocating bed, a plate adapted for supporting the color block and provided with sloping faces on its under side, slides provided with corresponding sloping faces and operating between the plate and the traveling bed, screws for shifting the slides so that the slopes on the plate mount on the slopes on the slides, worm wheels on the screws, worms gearing therewith a pawl wheel on the worm spindle, and a pawl lever which in the travel of the bed strikes against a bar on the machine framing and thus receives motion to turn the worm spindle substantially as set forth.

JOHN LACEY DAVIES.

Witnesses:

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