

(No Model.)

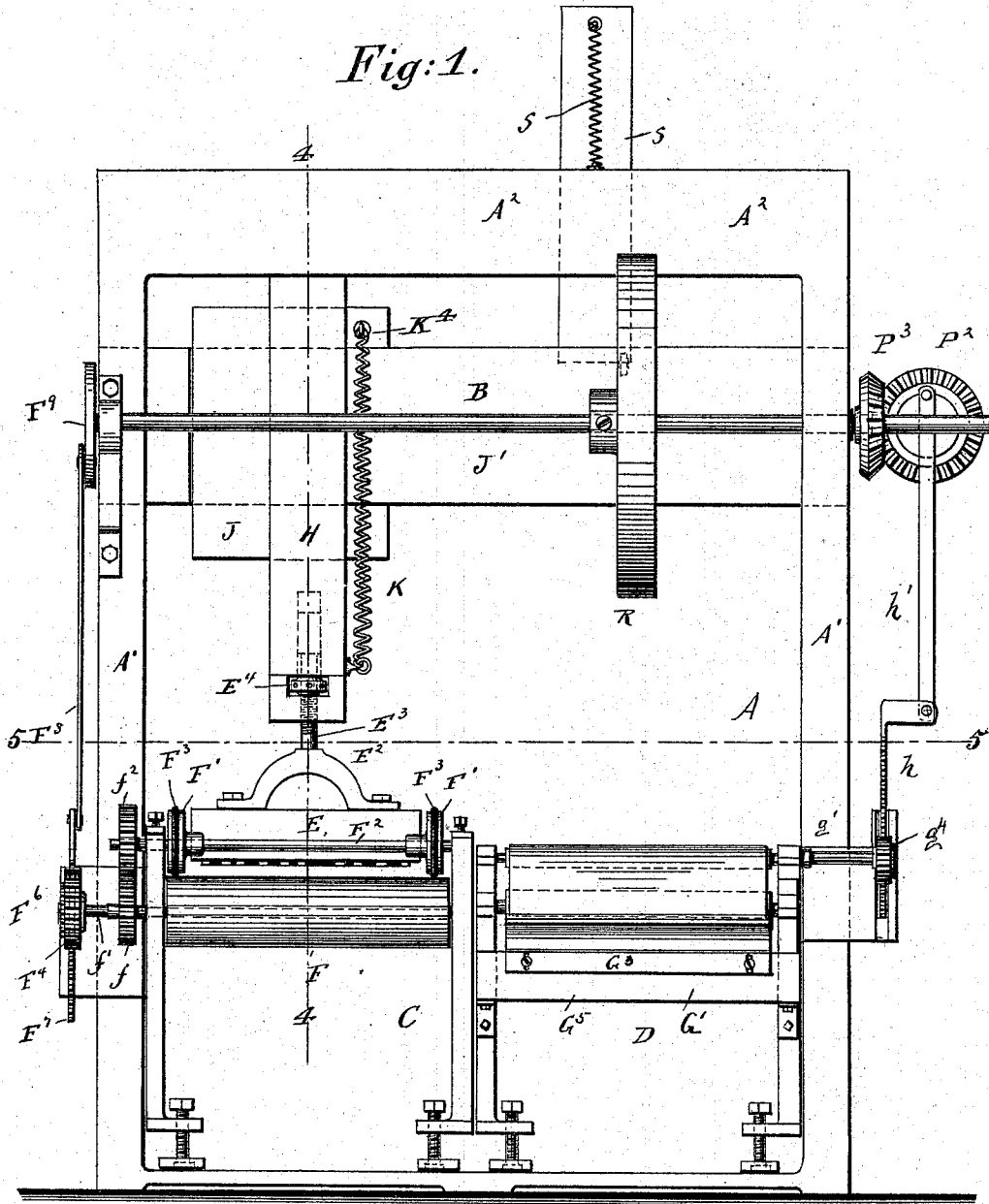
8 Sheets—Sheet 1.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.

Fig: 1.



WITNESSES:

Charles Schoector
Otto Reiss.

INVENTOR

R. Heilmann
BY *Gospel Reymann*

ATTORNEYS.

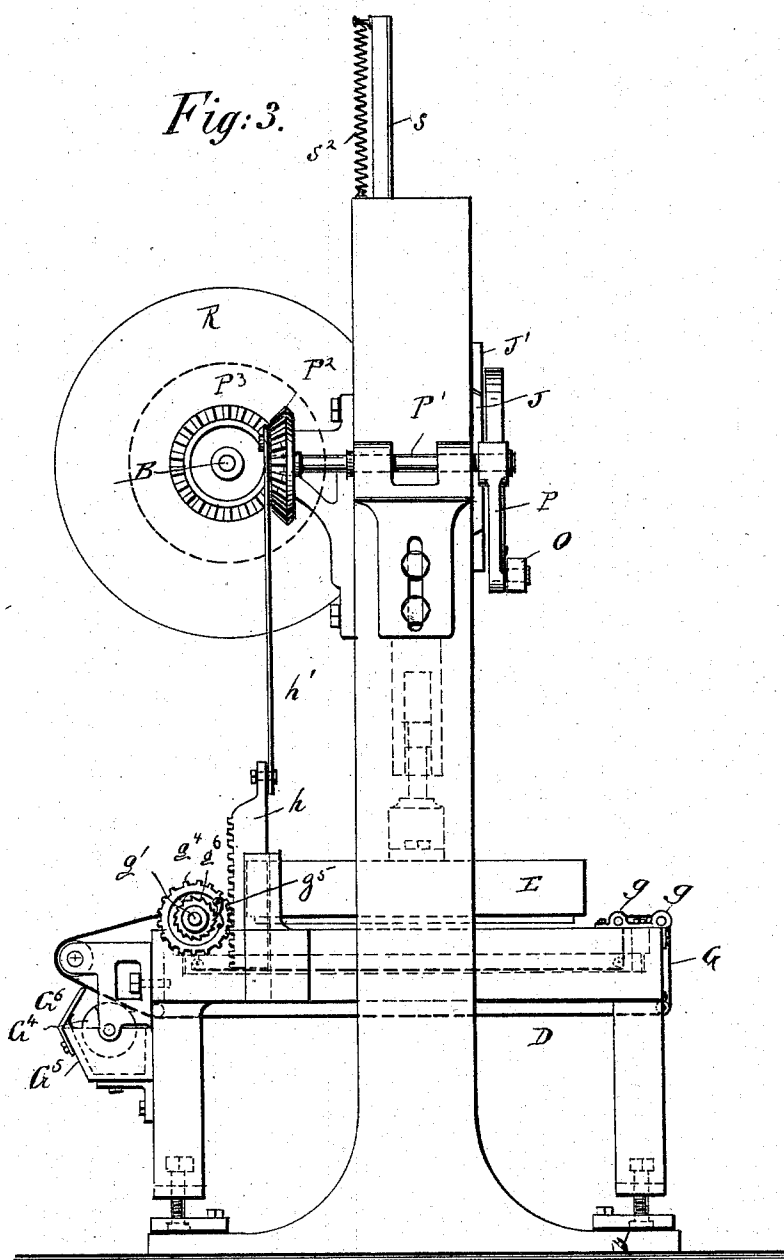
(No Model.)

8 Sheets—Sheet 3.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.



WITNESSES:

Charles Schroeder.
Otto Reiss

INVENTOR

R. Heilmann
BY *Gaezel Praeger.*
ATTORNEYS.

(No Model.)

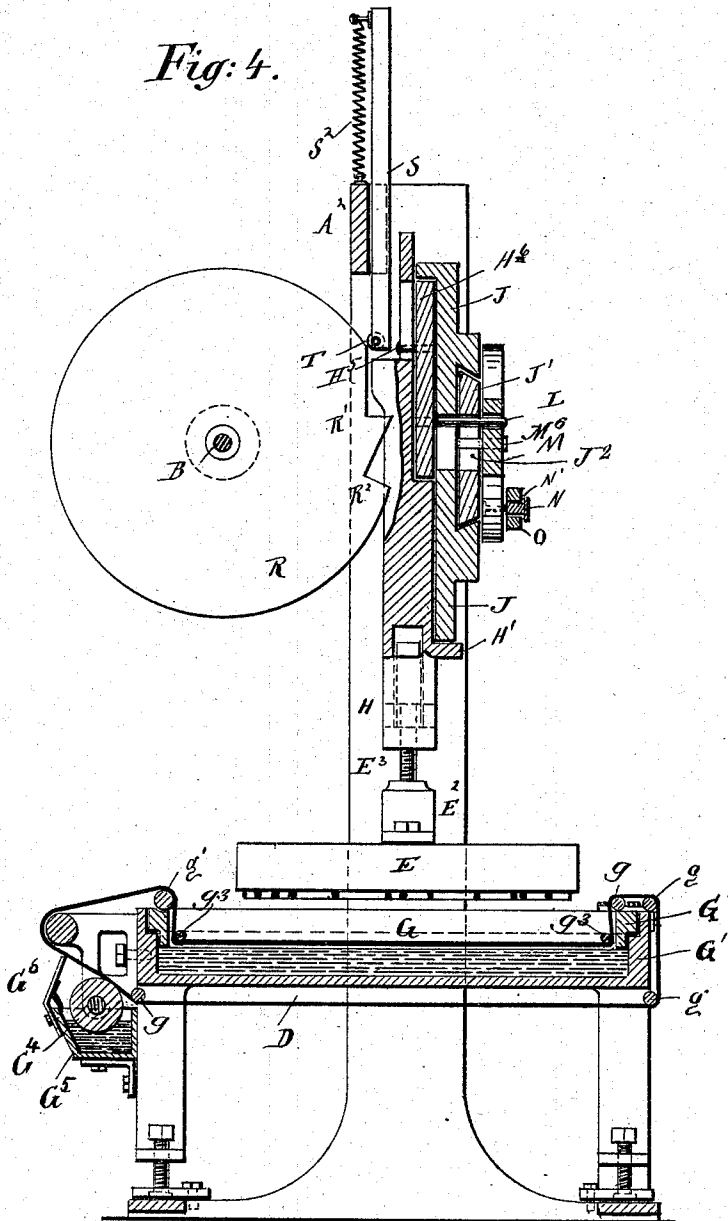
8 Sheets—Sheet 4.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.

Fig. 4.



WITNESSES:

Charles Schroeder.
Otto Reiss.

INVENTOR

R. Heilmann
BY Giespel & Preegenier.

ATTORNEYS.

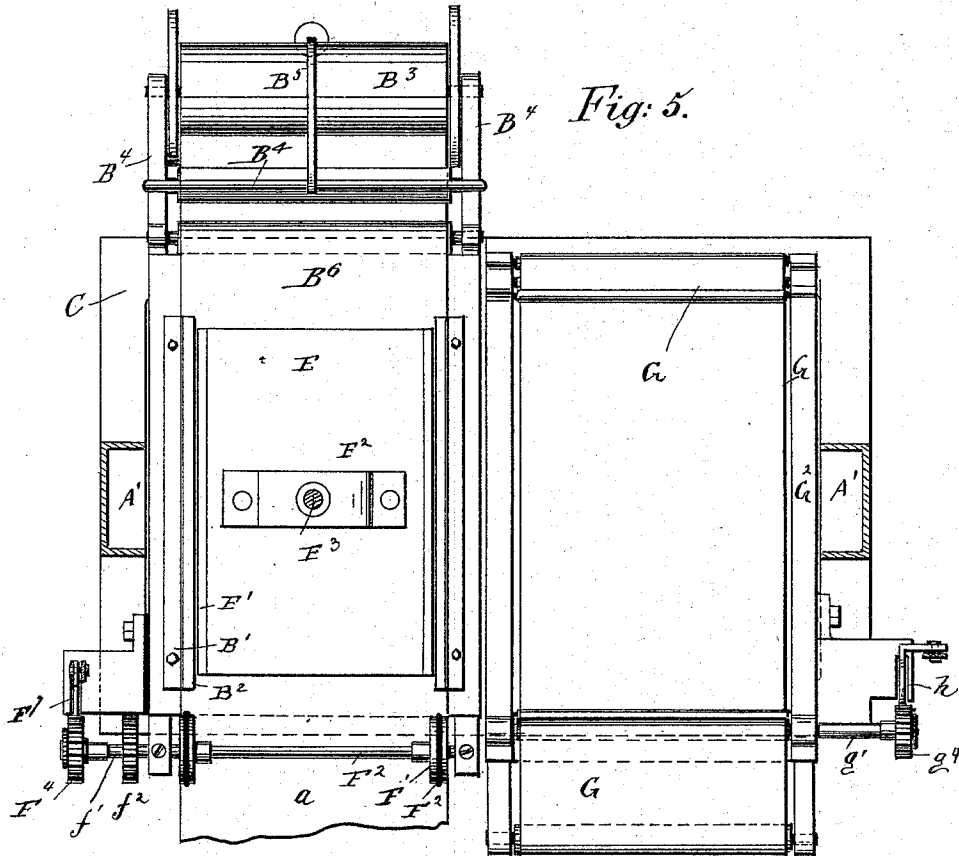
(No Model.)

8 Sheets—Sheet 5.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.



WITNESSES:
Charles Schroeder
Otto Reiss.

INVENTOR
R. Heilmann
BY *Samuel Baeyer*
ATTORNEYS.

(No Model.)

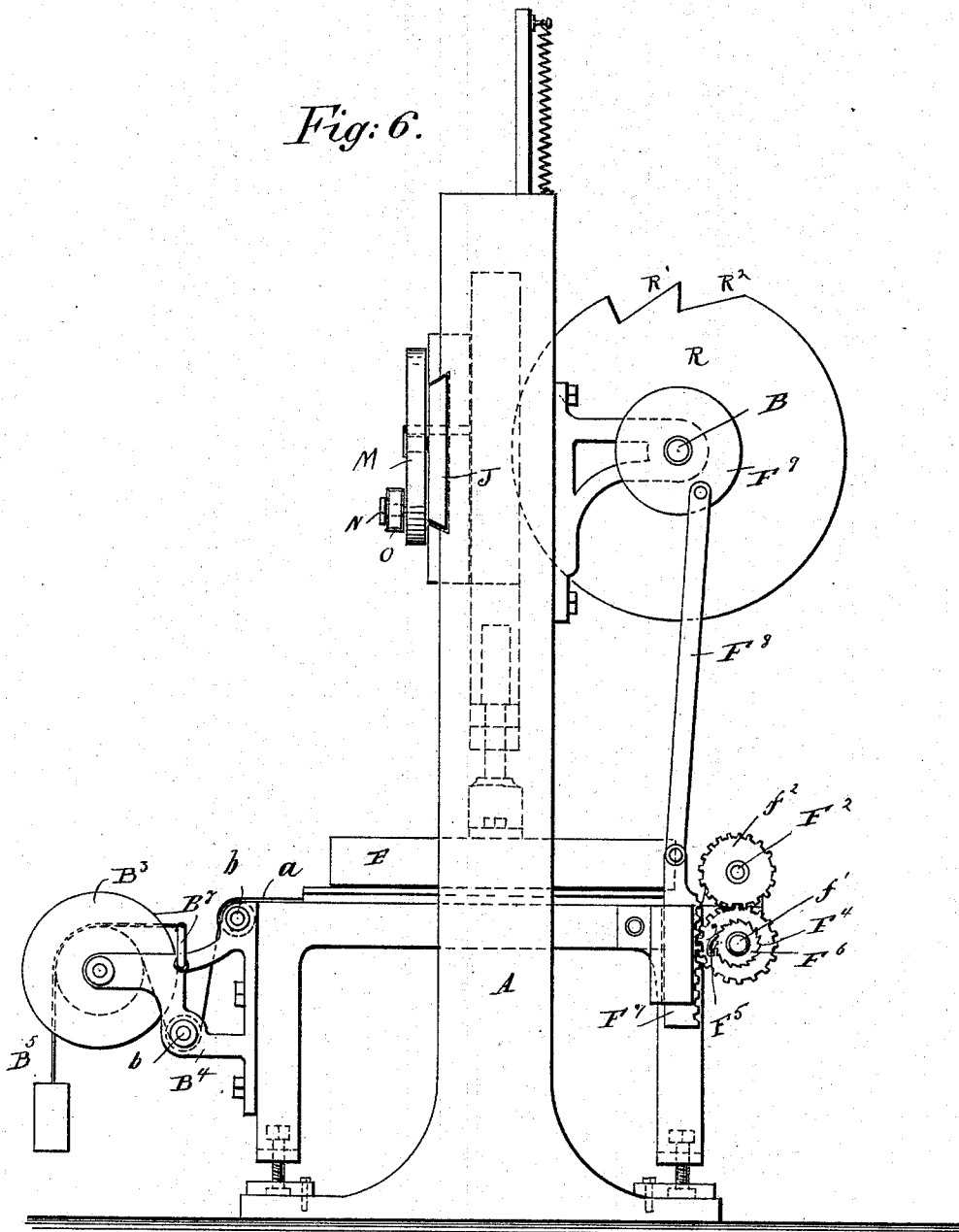
8 Sheets—Sheet 6.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.

Fig: 6.



WITNESSES:

Charles Schröder
Chas. Kable.

INVENTOR

INVENTOR
R. Heilmann.
BY Guepel & Raeyen

ATTORNEYS.

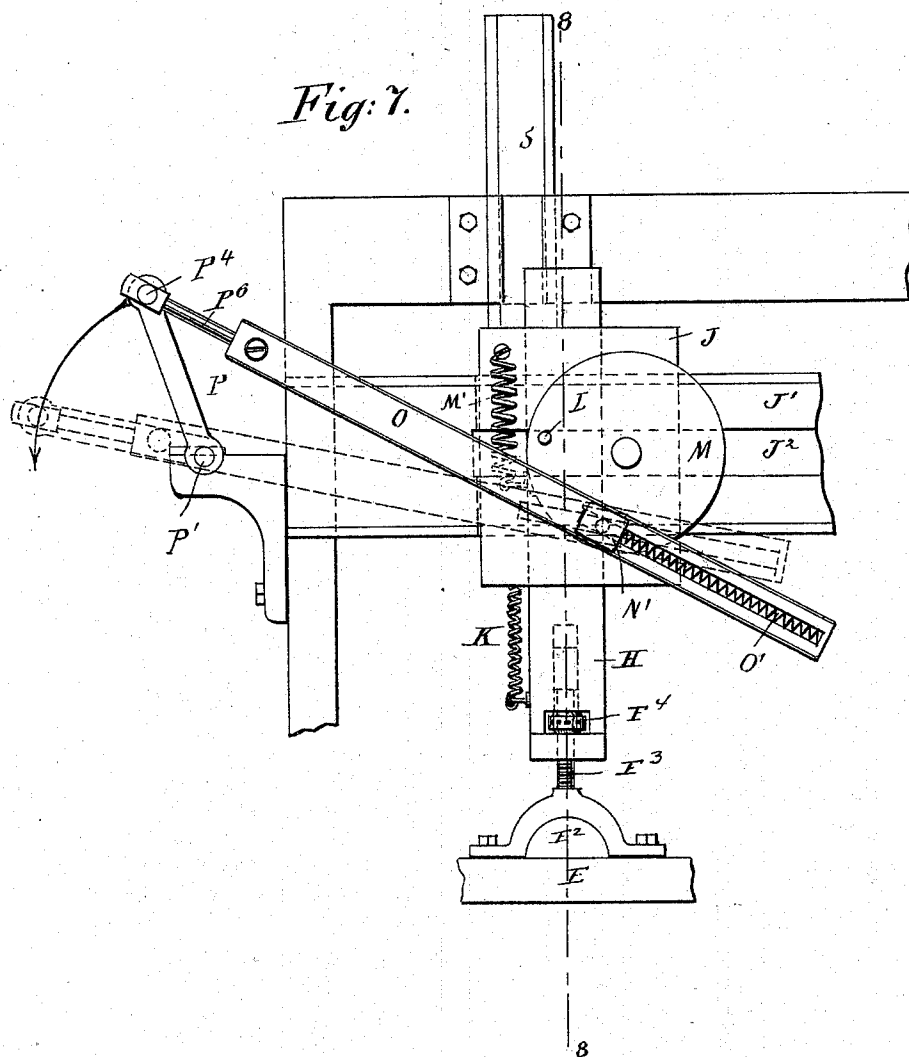
(No Model.)

8 Sheets—Sheet 7.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.



WITNESSES:

Charles Schroeder.
Otto Reiss.

INVENTOR

R. Heilmann
BY *Superior*

ATTORNEYS.

(No Model.)

8 Sheets—Sheet 8.

R. HEILMANN.
WALL PAPER MACHINE.

No. 527,976.

Patented Oct. 23, 1894.

Fig:8.

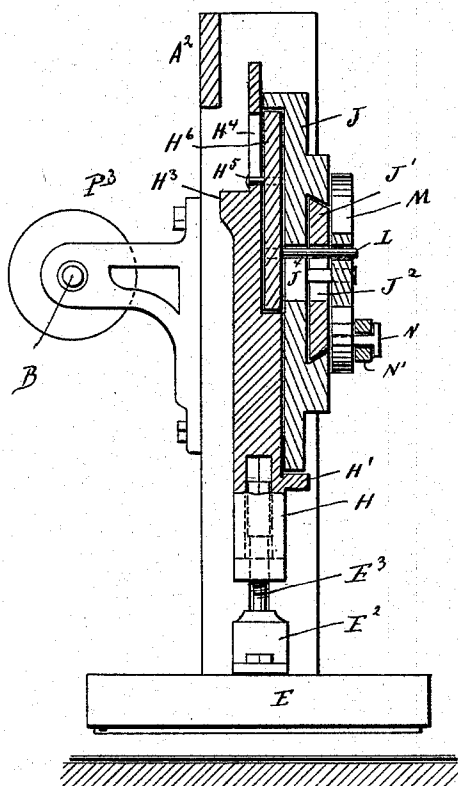
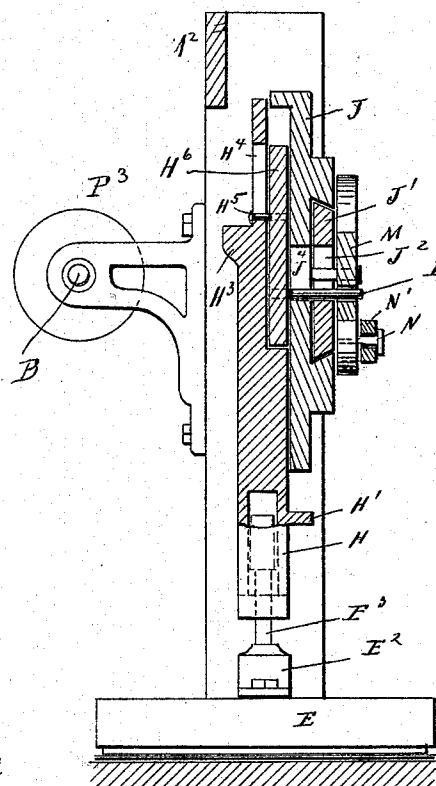


Fig:9.



WITNESSES:

Charles Schroeder
Otto Reiss.

INVENTOR

R. Heilmann
BY *Gustaf Roegner*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

RUDOLPH HEILMANN, OF NEW BRUNSWICK, NEW JERSEY.

WALL-PAPER MACHINE.

SPECIFICATION forming part of Letters Patent No. 527,976, dated October 23, 1894.

Application filed October 3, 1893. Serial No. 487,120. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH HEILMANN, a citizen of the United States, residing in New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Machines for Making Wall-Paper, of which the following is a specification.

Heretofore wall papers have been made by a hand process, which consisted in providing a suitable pattern block with color by hand and pressing this block upon a sheet of paper and repeating this operation a number of times until the desired colors had been printed; and wall papers have also been made by a continuous process in which the colors were successively printed in a single operation on the paper.

The object of my invention is to provide a new and improved machine in which the colors can be printed separately by means of a straight block, upon a strip of paper which is shifted after each impression and is passed through the machine as many times as there are different colors to be printed upon the same.

The invention consists in a machine for printing wall-paper and the like, constructed with a printing-table, a color-box and a support for a printing-block, means of shifting the printing-block support from the color-box to the printing-table and back again, and pressing the block upon the color-box, and upon the paper on the printing-table.

The invention also consists in the construction and combination of parts and details as will be set forth hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a front-elevation of my improved machine for printing wall-paper. Fig. 2 is a rear elevation of the same. Fig. 3 is an end elevation. Fig. 4 is a vertical transverse sectional view taken through the center of the presser-bar when the printing-block is over the color-box. Fig. 5 is a horizontal sectional view, on the line 5 5 of Fig. 1. Fig. 6 is an end elevation of the machine. Fig. 7 is an enlarged detail elevation from the rear of the mechanism for pressing out the block, and Figs. 8 and 9 are vertical sectional views, on the line 8 8, Fig. 7, the parts being shown in different positions.

Similar letters of reference indicate corresponding parts.

The entire mechanism is mounted on a frame A composed of the two standards A' and a top cross-piece A. In suitable brackets of the frame a driving shaft B is mounted. Between the standards of the frame the printing table C and the color-box D are mounted, both of which can be adjusted vertically by means of suitable screws passed through the legs, so as to bring them to the proper elevations. The printing table is provided with a suitable bed B⁶ of felt or other yielding material and is provided on its top at the side edges with two longitudinally-arranged angle-bars B' above which the angle-bars B² are arranged and are pressed upward by suitable helical springs surrounding guide-pins for guiding said angle-bars B².

The printing block E is provided on its side edges with angle-bars E' pressed downward by springs, which angle-bars E', when the printing block descends, can press on the tops of the angle-bars B² and press the latter downward, so that the bottom edges of said angle-bars B² press upon and hold the sheet of paper *a* passing over the bed of the printing table.

The paper *a* is wound on a suitable roll B³ supported in brackets B⁴ of the printing table, over which roll B³ a weighted tension strap B⁵ rests which strap is attached to a cross-bar B⁷ of the bracket B⁴. The paper passes from the roll B³ under the guide-rollers *b b'*, then over the printing table and over the feed-roller F, above which the two feed-disks F' are arranged, that are mounted on the shaft F² parallel with and above the roller F, said feed-disks F' having soft rubber-rims F³ that rest on the paper passing over the feed-roller F. On the shaft *f'* of the roller F a cog-wheel *f* is fixed and engages the cog-wheel *f*² on the shaft F². A cog-wheel F⁴ mounted loosely on the shaft *f'* of the roller F carries a spring-pawl F⁵ that engages a ratchet-wheel F⁶ fixed on the shaft *f'*. A vertically guided rack F⁷ engages said cog-wheel F⁴, and said rack is connected by a connecting-rod F⁸ with a wrist-pin projecting laterally from a wheel F⁹ fixed on the end of the driving shaft B. Whenever the rack F⁷ is moved upward, the shaft *f'* is rotated by

the action of the pawl F^5 on the ratchet-wheel F^6 , but when the rack F^7 moves downward the ratchet-wheel F^4 is turned in inverse direction on the shaft f' without rotating said shaft, whereby a positive intermittent feed is obtained and the paper is only fed during the time that the rack F^7 moves upward.

A slush-box G' is supported sidewise of the printing table C on suitable standards, a frame G^2 being arranged in the same, the sides of which are rabbeted so as to fit and rest on corresponding rabbets at the interior of the slush-box. The slush-box is filled with paper pulp and water in the usual manner to form a cushion or yielding color surface. An endless color-apron G passes over suitable rollers g on the slush-box and frame G^2 and over rollers g^3 in said frame and over a roller G^4 mounted in the trough G^5 at one end of the slush-box frame or table, which trough contains liquid color into which the roller G^4 dips. A doctor G^6 is attached to the trough G^4 and adapted to bear against the endless apron G , so as to scrape off the surplus color which slush-box with a color-apron, doctor and other connected parts will be designated hereinafter by the term "color-box."

The small shaft g' over which the endless color-apron G passes, carries at one end a loose cog-wheel g^4 , which carries a pawl g^5 that engages the ratchet-wheel g^6 fixed on said shaft g' . A rack h engages the cog-wheel g^6 and the upper end of said rack being pivotally connected by a connecting-rod h' , with the beveled cog wheel P^3 driven from the main driving-shaft by means of the bevel cog-wheel P^2 . The racks h and F^7 are so arranged and mounted that one passes upward while the other passes downward, or, in other words, in such a manner that when the paper is fed the endless color-apron remains stationary, and vice versa. When the endless color-apron is moved, the paper remains stationary.

The printing block E is secured to a yoke E^2 provided with an upwardly-projecting screw E^3 that passes through a nut E^4 mounted to turn in a suitable slot of the vertically reciprocating presser-bar H . The presser-bar H is mounted and guided to move vertically on a frame J having dove-tailed lugs that embrace the dove-tailed edges of a cross-bar J' uniting the standards A of the frame, which bar J' is provided with the longitudinal slot J^2 . A helical spring K has one end attached to the lower part of the presser-bar H and the upper end is fastened to a pin K^4 on the slide J , which spring has a tendency to draw the presser-bar upward until a lug H' of said presser-bar strikes against the bottom of the slide J , as shown in Fig. 8. The presser-bar is provided in its upper end with a laterally projecting lug H^3 for a purpose that will be set forth hereinafter. Above said lug the presser-bar is provided with a vertical slot H^4 , into which the pin H^5 passes

from the slide piece H^6 mounted in a suitable recess of the presser-bar between one side of the presser-bar and the inner surface of the slide J which slot and pin serve to guide the presser-bar. A pin L projects from said sliding-piece H^6 through the slot J^4 of the slide J and the slot J^2 of the bar J' into a disk M pivoted on the slide J , by the pin M^6 projecting from the slide J to the rim of which disk is fastened one end of a helical spring M' , the other end of which is attached to the top of the slide J , which spring M' has a tendency to turn the said disk in the direction of the arrow x in Fig. 2, that is, to turn the pin L toward the top of the slot J^2 . The slot J^4 is provided in the slide J to permit the up and down movement of the pin L . A wrist-pin N projects from the disk M into a guide-block N' passing through the longitudinal slot O' of a connecting-bar O , the opposite end of which is pivotally connected at P^4 with a crank P on one end of a shaft P' , by means of a rod P^6 held adjustably in the end of the bar O' , which shaft P' carries at the opposite end a bevel cog-wheel P^2 that engages a bevel cog-wheel P^3 on the main driving-shaft B .

A helical spring O^3 is interposed between the sliding bearing block N' in the slot O' and the end of said slot, as shown in Fig. 2, which normally holds the block N' at the left-hand end of the slide O' , but permits it to slide to the right when the parts are in the position shown in Fig. 7, without acting on the disk M . On the shaft B a cam-wheel R is fixed, which is provided with the two offsets R' , R^2 .

A plunger S having dove-tailed edges is guided vertically by dove-tailed clips S' on the top cross-bar of the frame and is pressed downward by a spring S^2 having one end attached to the plunger S and the other end to the frame of the machine. At its lower end said plunger carries at one edge an anti-friction roller T that can run on the rim of the cam-disk for a purpose that will be set forth hereinafter.

The operation is as follows: After the printing block E has been provided with color and brought into the position shown in Fig. 2, that is, above the paper on the printing table, the connecting-rod O continues to move in the direction of the arrow w , and as the sliding block N' in which the pin N is held is now at the end of the slot O' , said pin N is also moved in the direction of the arrow w . This produces a turning movement in the disk M , whereby the spring M' is brought in tension and the pin L moved downward. As said pin L is held in the sliding-piece H^6 the said sliding-piece is moved downward and bearing on the bottom of the recess in the presser-bar H presses the same downward. Thereby the printing block E is pressed upon the paper resting on the printing table, which paper is now in a position of rest. Before the printing block comes in contact with the

surface of the paper the angle-irons B² are pressed down and securely hold the paper and the angle-irons E' are pressed upward slightly so that as soon as the printing block E begins to rise the angle-irons B² will not rise with it, but will remain in lowered position until the face of the block has been moved a short distance from the paper that has been printed, thus preventing this paper from being raised by suction. It is evident that the springs acting on the angle-irons B² must be less powerful than the springs acting on the angle-iron E'. As soon as the pressure is taken off the pin L, the spring K draws the presser-bar H upward into the position shown in Fig. 7, so as to fully clear the devices on the printing table. The connecting rod O now moves in the inverse direction of the arrow w, Fig. 2, and moves the entire slide J and the disk M, the presser-bar H and the printing-block E in the inverse direction of the arrow w, that is, to the opposite end of the slot J². By the time that the slide J has arrived at the left-hand end of the slot J², Fig. 2, it is over the color-bath in the slush-box, and by this time the cam-roller R has moved to such an extent that the lower end of the plunger S slides off the rim of the same and strikes against the lug H³ of the presser-bar H which by this time has been brought in line with the plunger and forces the same downward suddenly under the action of the spring K. The cam-wheel R again forces the plunger upward, when the cam-wheel R is further rotated. The plunger S, again descends under the action of its spring and again strikes the lug or shoulder H³ of the presser-bar, again pressing down said presser-bar which is then immediately raised by its spring K. During the rest of the revolution of the cam-wheel, the plunger S is held in raised position by the action of the rim of the cam-wheel on the anti-friction roller T on the lower end of the plunger S. As the printing block has twice been brought in contact with the endless color-apron G it is uniformly supplied with color. While the printing block is in raised position, the slide J is moved by the crank-arm P and connecting-rod O in the direction shown by the arrow w Fig. 2, and again brought in position over the printing table, where said printing block is again lowered and pressed upon the paper by the action of the end of the slot O' on the pin N, whereby the disk M is turned in the inverse direction of the arrow x, Fig. 2, and the pin L is moved downward so as to depress the presser-bar and press the block upon the paper, and so on. During the time that the printing block is above the printing table, the paper is at rest, but the rack h is being moved upward and turns the shaft g' whereby the endless color-apron G is shifted in the slush-box, so that a fresh surface will be presented to the printing block when the same is forced down again by the plunger S. During the time that the plunger is above

the color apron and is receiving color, the paper is shifted as at that time the rack F⁷ is moved upward and rotates the feed-rollers of the paper in such a manner as to draw the requisite length of paper from the roll B⁸ over the printing table. As the feed of the paper is absolute and correct and precisely the same length, the paper is fed each time the feed apparatus operates. The end of the figure produced by one impression of the printing block will tally exactly with the end of the next. After one color has been printed in this manner and the paper dried the paper can be run through the same machine with a different block, or the paper can be dried after leaving one machine and then immediately passed through a second machine having a block for printing a different color, and so on.

My improved machine can also be used for printing oil-cloths, carpets, window-shades and other fabrics, in which case, in place of a paper web, the web of a suitable fabric is fed over the printing table, and subjected to the action of the printing block as described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A machine for printing wall paper and the like, constructed with a printing table and a color-box having a shiftable color-apron, at all times remaining on the impression surface of the color-box, a support for a printing-block, means for shifting the printing-block support from the printing-table to the color-box and vice versa and for lowering the color-block both when above the color-box and above the printing-table, means for shifting the color-apron when the printing-block is above the printing-table, means for shifting the paper when the printing-block is above the color-box, and means for delivering a blow upon the printing-block when it rests on the color-apron, substantially as set forth.

2. A machine for printing wall paper and the like, constructed with a printing table and a color-box adjacent to each other and a vertically and longitudinally movable support for the printing-block, means for shifting said support vertically and horizontally and lowering and raising the same both when above the printing-table and when above the color-box, an automatic paper feeding device for unwinding the paper from the roll at one end of the printing-table and drawing the paper over the printing-table during the time that the printing-block is raised from said printing-table, and means for delivering a blow upon the printing block when it rests on the color-apron, substantially as set forth.

3. A machine for printing wall paper and the like, constructed with a printing-table and a color-box, a vertically and horizontally movable support for a printing block, means for shifting said support horizontally and vertically and lowering or raising the same both when above the printing table and above the

color-box, an automatic paper-feeding device operated from the same shaft that operates the printing block, an endless color-apron in the color-box, means for shifting the color-apron from the same shaft that operates the printing block, and means for delivering a blow upon the printing block when the same rests on the color-apron, substantially as set forth.

4. A machine for printing wall paper and the like, constructed with a printing table and a color-box, a horizontally and vertically movable support for a printing-block, means for shifting said block and lowering and raising the same both when above the printing-table and when above the color-box, an automatic paper-feeding device connected with the printing-table, an endless apron in the color-box, means for operating the paper shifting device and the color paper shifting device alternately and at intervals, and means for delivering a blow upon the printing-block when it rests on the color apron, substantially as set forth.

5. A machine for printing wall-paper and the like, constructed with a color-box, a vertically movable support for a printing-block, a spring pressed plunger for striking upon the printing-block support, a cam-wheel having offsets, which cam-wheel raises the plunger and permits it to descend and strike the printing-block support under the action of its spring, substantially as set forth.

6. In a machine for printing wall paper and the like, the combination, with a printing table and color box, of a vertically movable support for the printing block, means for traversing the printing-block to and over the color-box, and returning the same to the printing-table a plunger, a spring acting on the plunger, which plunger can act on an offset of the printing block support, a cam-wheel on which the lower end of the plunger can rest, which cam-wheel has two offsets to release the plunger and permit the same to strike the printing block support, substantially as set forth.

7. In a machine for printing wall paper and the like, the combination, with a printing table and a color box, of a suitable frame, a slide mounted to move horizontally on a cross bar of said frame, a presser-bar mounted to slide vertically in said slide, a printing block

on said presser bar, a wheel pivoted on the slide and having a pin acting on the presser-bar, a crank, and a connecting rod connecting the wrist-pin of said wheel with the crank, means for forcing the printing-block into contact with the color-box when over the same, substantially as set forth.

8. In a machine for printing wall-paper and the like, the combination with a printing-table and a color-box, of a frame, a horizontal guide-rail on said frame, a slide mounted on said guide-rail, a presser-bar mounted in the slide to move vertically, a printing-block on said presser-bar, a spring for drawing said presser-bar upward, a wheel mounted on the slide, a pin projecting from said wheel, a slide piece into which said pin passes, which slide-piece is located in a recess of the presser-bar, a spring connected with the slide and with the rim of the wheel for turning the wheel upward, a crank, a rod connecting the crank with a wrist pin on the wheel and means for forcing the printing-block into contact with the color-box when over the same, substantially as set forth.

9. In a machine for printing wall paper and the like, the combination, with a printing-table and a color box, of a frame, a horizontally longitudinally slitted rail on said frame, a slide mounted on said rail, a vertically movable presser bar on the slide, a printing block on said presser bar, a slide piece located in a recess between the presser bar and the slide, a pin projecting from said slide piece, a wheel pivoted on the slide and engaging said pin, a spring attached to the slide and to the rim of the wheel, a spring for drawing the presser-bar upward, a crank, a longitudinally slotted connecting bar connected with the crank, a wrist-pin projecting from the wheel through said slot, and a spring arranged between the wrist-pin and the closed end of the slot of the connecting bar, and means for forcing the printing-block into contact with the color-box when over the same substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

RUDOLPH HEILMANN.

Witnesses:

PAUL GOEPEL,
CHARLES SCHROEDER.