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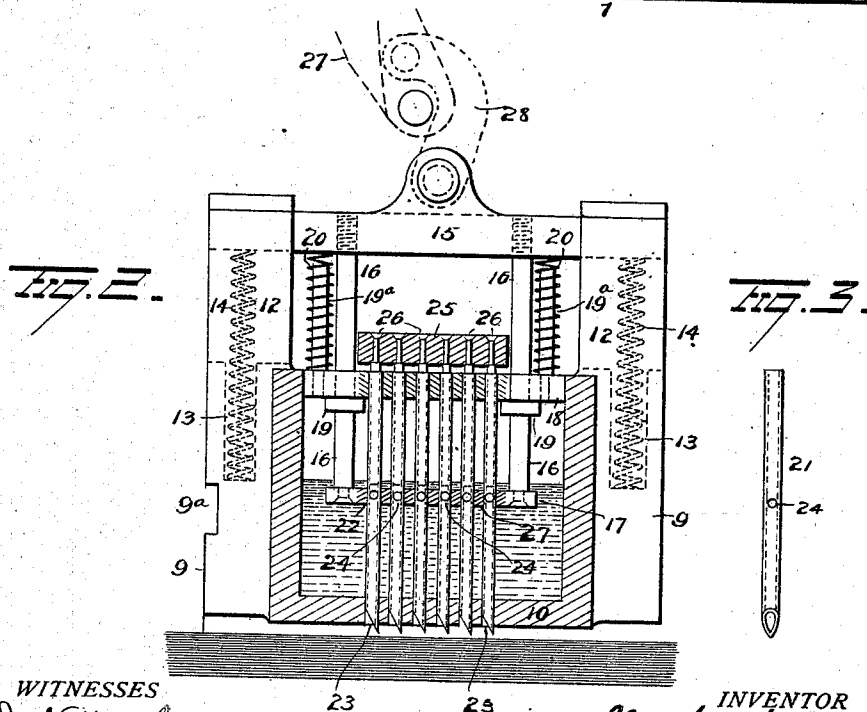
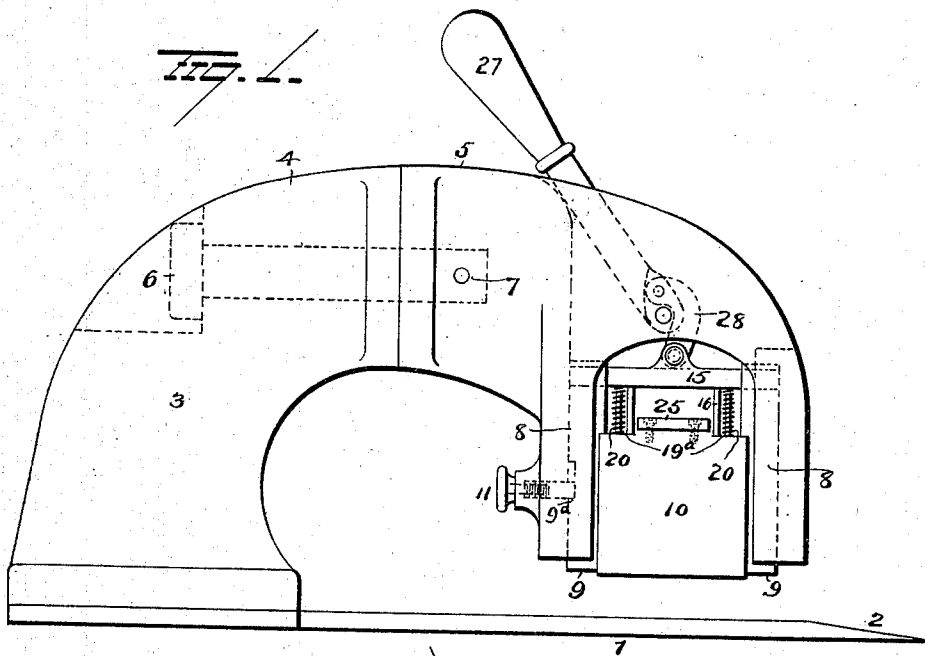
Patented Aug. 20, 1901.

W. H. HUDSON.
PERFORATING MACHINE.

(Application filed Dec. 20, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES
E. D. Nottingham
G. F. Downing.

INVENTOR
W. H. Hudson
By H. A. Seymour
Attorney

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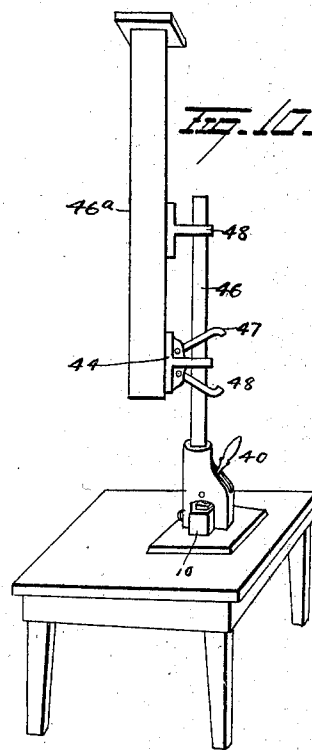
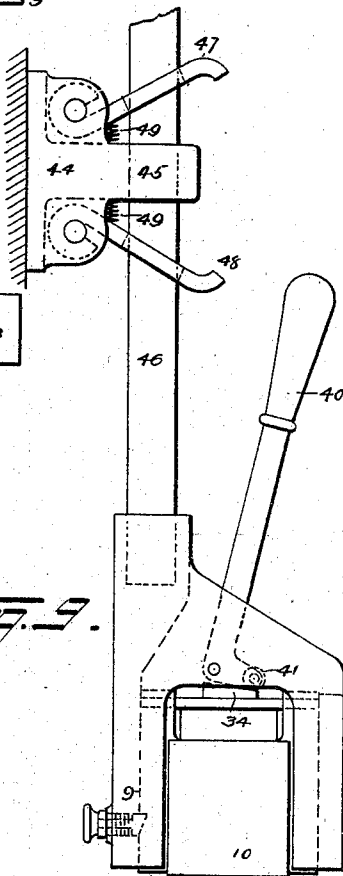
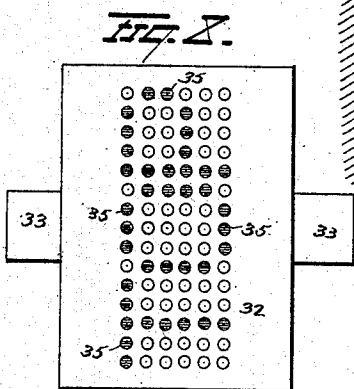
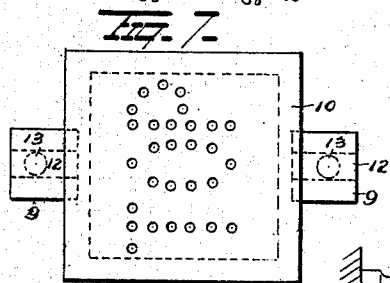
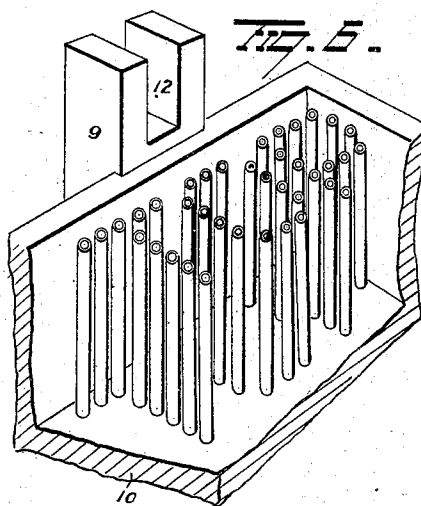
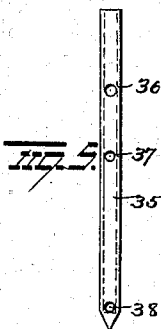
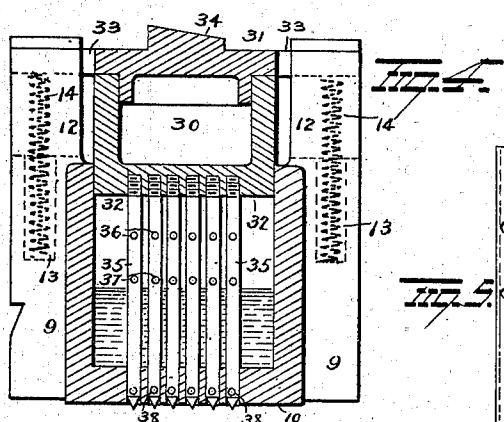
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(No Model.)

2 Sheets—Sheet 2.



WITNESSES
E. J. Nottingham
G. F. Downing.

INVENTOR
W. H. Hudson
By H. A. Symon
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM H. HUDSON, OF MOUNT VERNON, NEW YORK.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,121, dated August 20, 1901.

Application filed December 20, 1900. Serial No. 40,552. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HUDSON, of Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Perforating-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in perforating-machines, the object of the invention being to produce a device capable of forming characters, symbols, numerals, letters, and combinations of letters by a series of perforations through a sheet or a superposed layer of sheets and simultaneously coloring the walls of the perforations forming the characters, symbols, &c.

A further object is to provide a device which shall be comparatively simple in construction, durable in use, and which shall be effectual in all respects in the performance of its functions.

With these ends in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a view of my improved perforating-machine. Fig. 2 is a view in section of the same. Fig. 3 is a detached view of one of the perforating-needles represented in Fig. 2. Fig. 4 is a view in section of a modification. Fig. 5 is a detached view of one of the needles illustrated in Fig. 4. Fig. 6 illustrates the arrangement of the needles when set for perforating the word "top." Fig. 7 is a bottom plan view of the ink or fluid receptacle, the arrangement of holes therein being for the passage of the needles to perforate the word "top." Fig. 8 represents a bottom plan view of the two-part plunger shown in Fig. 4. Fig. 9 is a view of my improved means of adjustably supporting the perforating-machine from a side wall, and Fig. 10 is a similar view illustrating an overhead adjustable support.

1 represents a plate or bed, preferably made of steel and beveled, as at 2, so as to permit of its being readily inserted under the

paper or other material to be perforated, and 3 is an arm or supporting-frame, rigidly secured upon said plate or bed and upon the section thereof opposite the beveled portion 2. The arm or supporting-frame 3 comprises the two parts or sections 4 and 5, the former of which is rigidly secured upon base 1, as above described, while the section 5 thereof is loosely secured to section 4, the attachment being effected by bolt 6, which latter extends through the alining recesses formed in the respective abutting sections, section 5 being supported on said bolt and held thereon against displacement by a pin 7, passing there-through and into the bolt. Thus it will be seen that while the section 5 is firmly supported in close contact with section 4 it is free to swing in either direction to a position at right angles to plate or bed 1, whereby access to the bottom of the receptacle carried thereby is provided. The depending or U-shaped member of section 5 is provided at diametrically opposite points with the elongated slots 8 8 for the reception of the ribs or enlargements 9 9, formed on the opposite sides of ink or fluid receptacle 10, which latter is removably supported in said depending U-shaped member by the set-screw 11 entering the recess formed in one of the ribs or enlargements 9. These ribs 9 are each provided with an elongated slot 12 and with a communicating recessed seat 13 for the reception of a spring 14, the said slots being disposed opposite one another and constitute guideways for the respective ends of the presser-bar 15, now to be explained.

The ends of the presser-bar 15 are mounted in the slots 12 and are supported in an elevated position therein by the springs 14, the free ends of which latter rest in contact with the bottom face of said presser-bar and at all times exert pressure thereon in an upward direction. Secured to and depending from the bottom of presser-bar 15 is a pair of arms 16, carrying at their lower ends the valve-plate 17, which latter at all times rests below the level of the ink or fluid contained in receptacle 10. These depending arms pass through platen 18, and through the medium of the stops or blocks 19 carried thereby said platen is raised to and supported in its elevated position. This platen 18 is provided at

points adjacent to the openings through which arms 16 16 pass with the upwardly-projecting posts or standards 19^a 19^a, which terminate a short distance below the bottom face of the presser-bar 15, so as to permit the latter to travel a short distance before making contact therewith, and the bar 15 is normally maintained thus separated from the posts 19^a by means of coiled springs 20.

The needles 21, which are hollow throughout their entire length, have their heads or upper ends secured in the holes formed in platen 18 and pass downwardly through holes 22, formed in the valve-plate 17, and finally terminate in the holes 23, formed in the bottom of receptacle 10, their pointed or beveled ends preferably projecting slightly below the bottom face of said receptacle. These needles 21 are provided between their ends with valve-openings 24, which are normally closed by the valve-plate 17, through which the needles pass, whereby the flow of ink or liquid contained in the receptacle through said valve-openings is prevented when the parts are at rest or in their normal position. Should any ink or coloring fluid remain in the needles after the completion of a perforating operation, it will be held suspended therein by the plungers hereinafter referred to.

Located above plate 18 is a plunger-block 25, preferably carried by and secured to the receptacle 10 and carrying a series of depending plungers 26, which project downwardly through the open heads of needles 21 and terminate therein a short distance above the valve-openings 24. These plungers are supported immovably within the needles 21 and act as suction-pumps to draw in the ink or other fluid through valve-openings 24 as soon as valve-plate 17 is moved out of engagement with said valve-openings and also operate to force said fluid through the beveled open ends of said needles during their ascent, whereby the ink will be evenly distributed upon the walls of the perforations made during the ascent of the needles.

The number of holes formed in the platen 18, valve 17, and bottom of receptacle 10 depend entirely upon the number of needles required to form the outline of the character, symbol, &c., to be perforated, and whether one or many needles are employed a plunger for each needle is provided.

The presser-bar or plunger 15 is controlled by a lever 27, pivotally mounted in a recess formed in section 5 directly above said presser-bar and is coupled up with the latter by means of a link 28 of the bell-crank variety.

When it is desired to perforate a character, symbol, or other device or object in the body portion of a sheet or superposed layer of sheets and simultaneously color the walls of the perforations, the beveled end of bed 1 is passed under the sheet or sheets and the latter brought to a position directly under the ink or liquid receptacle 10. Lever 27 is then moved in a forward direction, and after

the same has passed the center of gravity the receptacle will be lowered onto the paper and act as a presser-foot and pressure in a downward direction will be exerted upon presser-bar 15, whereupon it begins its descent, and as valve-plate 17 is fixed to the lower ends of arms 16 16 it follows that said valve-plate likewise begins its descent, and as soon as the latter moves downwardly a distance sufficient to uncover the valve-openings 24 in the needles 21 the bottom face of said presser-bar will have reached the upper ends of posts 19^a 19^a. The presser-bar now having reached the upper ends of the posts 19^a 19^a further pressure upon the lever will cause platen 18 and its attached needles to descend and perforate the sheet or sheets firmly clamped between the bottom of receptacle 10 and bed or plate 1, and during this part of the operation the plungers 26 will draw in through valve-openings 24 the ink or coloring liquid for coloring the walls of the perforations. As soon as the limit of the downward movement of the needles is reached, the direction of movement of the lever is reversed and the platen and its connected needles returned to their normal position, during which movement the ink or fluid stored in said needles is forced through their beveled ends by the action of plungers 26 and evenly distributed upon the walls of the perforations. In this upward movement of platen 18 it will be observed that as soon as the direction of lever 27 is reversed the arms 16 16, depending from presser-bar 15, must travel a distance equal to that which separates the latter from the upper ends of posts 19^a 19^a when they are in their normal position and that as soon as this distance is traveled the blocks 19, secured on said arms 16 16, will arrive against the bottom of platen 18 and carry valve-plate 17 into a position to close valve-openings 24, whereupon the presser-bar and its depending arms will begin to ascend and bring with them the platen 18 and its attached needles.

The manner in which the ink or fluid is discharged from the needles will be apparent when it is noticed that almost immediately upon the reversal of lever 27 and before the needles have begun to ascend the valve-plate 17 is brought to a position to close the valve-openings in the needles, and as the plungers are stationary the upward movement of the needles on said plungers will cause the latter to force the coloring fluid out through the ends of the needles and coming in contact with the walls of the perforations colors the paper, so as to more clearly and distinctly bring out the outline of the character, symbol, word, or the like made by the needles during their descent. It will be observed that as soon as lever 27 passes the center of gravity the receptacle 10 will by reason of the length of slot 9^a in rib 9 in which the end of thumb-screw 11 rests be free to drop upon the sheet or sheets to be operated upon and by reason of its weight act as a clamp or presser-foot

for firmly holding said sheet or sheets against accidental movement.

In the modification shown in Fig. 4 the ink or fluid receptacle is provided with a plunger 30, preferably comprising an upper section 31 and a lower section 32, the said sections being hollowed out and connected together in any desired manner. The lower portion of section 32 snugly fits within the open end of receptacle 10, while the outwardly-extending arms 33 33 of section 31 project within the slots 12, formed in the ribs 9 of said receptacle, and are movably supported therein in the manner hereinbefore described. The top of section 31 is provided centrally with an inclined surface 34, upon which rests and moves the roller carried by the operating-lever, to be hereinafter described. The bottom of section 32 of the plunger is provided on its lower face with a series of recesses, in which the heads of the needles 35 are firmly secured. These needles are closed at their pointed ends and are provided at points between their ends with three openings communicating with the hollow centers, the upper openings 36 and 37 being disposed adjacent to one another and when the needles are at rest are above the level of the ink or fluid contained in the receptacle, while the lower openings 38, which are disposed adjacent to the pointed ends of said needles, are adapted to rest within the openings formed in the bottom of receptacle 10 and through which said needles pass when being depressed.

With the construction of plunger just described the lever 40 (shown in Figs. 9 and 10) is employed. This lever is of the bell-crank variety and is pivoted in a recess in the inverted-U-shaped supporting-frame and provided at the free end of its shorter arm with a roller 41, which moves in contact with the inclined face 34 on the upper section 31 of the plunger.

When the plunger of this style of perforating-machine is depressed, the needles instead of cutting out small sections simply puncture the material operated upon. The ink or coloring fluid for coloring the punctured outline is taken into the needles through the central series of openings as soon as said openings are submerged and is forced out of the lower series of valve-openings by the compressed air entering the uppermost series of openings.

In the construction shown in Fig. 9 the press is shown adjustably suspended from a hanger secured to a partition or other vertical support, whereby it may be adjusted vertically for carrying it out of the way or for adjusting or placing the patterns or other objects beneath the same. The suspending device comprises a bracket 44, rigidly secured to the wall and provided with an opening 45 for the passage of the stem 46, carrying the supporting-frame and its attached parts. Pivotally secured to the bracket, above and below the opening therein, are the clamps 47

and 48, the former of which is pressed upwardly and the latter downwardly by the springs 49 49. These clamps are each provided with a hole for the passage of the stem 46, and hence it will be seen that when they are released the edges of the side walls of the clamps firmly engage the stem and hold it solidly against vertical movement in either direction. By simply grasping the free ends of the clamps and pressing them together in order to disengage the clamping edges from the stem the latter can be adjusted vertically up or down to any desired position. The construction shown in Fig. 10 is precisely the same, except that the bracket and clamps are carried by the post 46^a, depending from the ceiling. In the latter instance the stem may be further guided by the auxiliary bracket 48, which prevents any lateral movement on the stem.

While I have shown the device having the atmospheric plunger suspended from either the side wall or ceiling, as shown in Figs. 9 and 10, it is evident that it can be employed in connection with the supporting structure shown in Fig. 1. It is also evident from the foregoing that the outline of various characters, symbols, numerals, words, &c., may be perforated or punctured in the body of a sheet or superposed layer of sheets of paper or other material and the outline thus formed brought out more clearly and distinctly by coloring fluid by simply providing interchangeable needle-carrying parts. It is further evident that changes in the construction and relative arrangement of the several parts might be made without avoiding my invention, and hence I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described; but,

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

1. In a marking-machine, the combination with a support and a vessel for coloring-matter, of a series of needles constructed to take fluid from said vessel, means for passing the needles through the material and means for discharging coloring-matter from said needles while they are being withdrawn from the material.

2. In a marking-machine, the combination with a vessel to contain coloring-matter and having a series of openings in its bottom, of a movable device, a series of needles carried by said movable device and passing through the vessel and movable through the openings in the bottom thereof, each of said needles being constructed and adapted to convey coloring-matter from the vessel and discharge it in the perforations made in the material by said needles, when the latter are being withdrawn therefrom.

3. In a marking-machine, the combination with a vessel to contain coloring-matter and having a series of holes in its bottom, of a se-

ries of needles passing through said vessel and movable through the holes in the bottom thereof, means for operating said needles to puncture the material and convey coloring-matter from the vessel to the material when the needles are being withdrawn.

4. In a marking-machine, the combination with a vessel to contain coloring-matter and having a series of openings in its bottom, of a platen or plunger mounted within the upper portion of said vessel, a series of tubular needles depending from said platen or plunger and passing through the vessel and movable through the openings in the bottom thereof and means for moving said needles to puncture the material and to convey coloring-matter from said vessel to the material when said needles are being withdrawn.

5. In a machine for marking paper or fabric, the combination with a vessel to contain coloring-matter and having a series of openings through its bottom, of a series of needles movable through said vessel and corresponding in number to the openings in the bottom and means within the vessel for controlling the passage of the coloring-matter into and out of each of said needles.

6. In a machine for marking paper or fabric, the combination with a vessel to contain coloring-matter and having a series of openings through its bottom, of a series of needles mounted in and movable through said vessel and corresponding in number to the openings in the bottom of the vessel, each needle constructed to convey coloring-matter from the vessel to the material to be operated upon and a traveling presser-bar for depressing the needles through and independently of the vessel.

7. In a machine for marking paper or fabric, the combination with a vessel to contain coloring-matter and having a series of openings through its bottom, of a platen mounted to move within the upper portion of said vessel, a series of hollow needles mounted in and depending from said platen through the vessel, the needles being constructed to take in and convey coloring-matter to the material to be operated upon, means for depressing the platen and its attached needles and means for forcing the coloring-matter through the open ends of said needles when they are being withdrawn from the material.

8. In a machine for marking paper or fabric, the combination with a vessel containing coloring-matter and having a series of openings through its bottom, of a platen mounted to move in said vessel, a series of hollow needles mounted in and depending from said platen and corresponding in number to the openings in the bottom of the vessel, each needle being provided with a valve-opening, a valve-plate for closing said valve-openings and a presser-bar for depressing the platen and moving the valve-plate out of engagement with the valve-openings.

9. In a machine for marking paper or fabric, the combination with a vessel containing coloring-matter and having a series of openings through its bottom, of a platen suspended in the open end of said vessel and provided with upwardly-extending arms or posts, needles secured in and depending from said platen and corresponding in number with the openings in the bottom of the vessel, each needle constructed to convey coloring-matter from the vessel to the material to be operated upon and a presser-bar for engaging and exerting pressure upon the upper ends of said posts whereby the platen and its attached needles are depressed.

10. In a machine for marking paper or fabric, the combination with a vessel containing coloring-matter and having a series of openings through its bottom, of a platen suspended within said vessel and provided with upwardly-projecting posts, a series of hollow needles mounted in openings formed in said platen, each needle being provided between its ends with a valve-opening, plungers mounted in the open upper ends of said needles, a presser-bar movably supported by the vessel and provided with depending arms carrying at their lower ends a valve-plate for closing the needle-valve openings and means for raising and normally supporting the platen.

11. In a marking-machine, the combination with a stationary support, of a vessel-supporting frame adjustably mounted on said fixed support and perforating and marking devices supported by the adjustable frame.

12. In a marking-machine, the combination with an arm or supporting-frame comprising two sections, one of said sections being fixed while the other section is movably supported by the stationary section.

13. In a marking-machine, the combination with a base, and a supporting arm or frame secured to said base, of a vessel removably supported in said arm or frame and above the base and means for lowering said vessel upon the material to be operated upon whereby said vessel will act as a presser foot or clamp.

14. In a marking-machine, the combination with a vessel to contain coloring-matter, of a series of tubular needles movable through said vessel, each needle having a hole above its bottom, of means for opening and closing the said holes in the needles to control the entrance of coloring-matter into the needles and the discharge of coloring-matter from said needles.

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

WILLIAM H. HUDSON.

Witnesses:

KATHARINE W. DENMAN,
FREDERICK H. DENMAN.