

(No Model.)

3 Sheets—Sheet 1.

G. W. BISHOP, Dec'd.

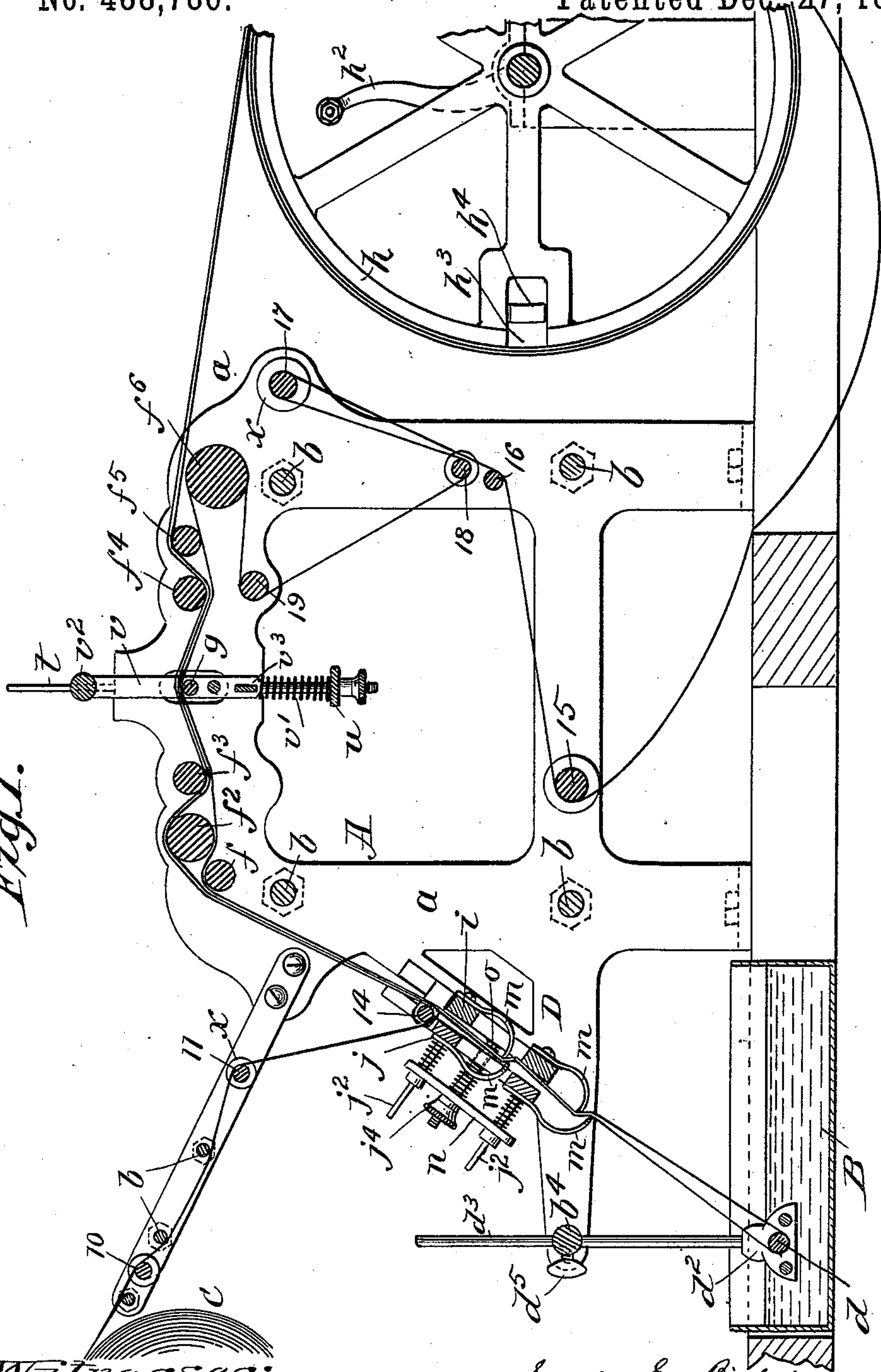
S. E. BISHOP, Administratrix.

METHOD OF AND APPARATUS FOR MAKING INKED RIBBONS.

No. 488,786.

Patented Dec. 27, 1892.

Fig. 1.



Witnesses:

J. H. Gifford
T. F. Deane.

Sarah E. Bishop -
Administratrix of estate of
George W. Bishop - Inventor,
per Chapman & Co attys.

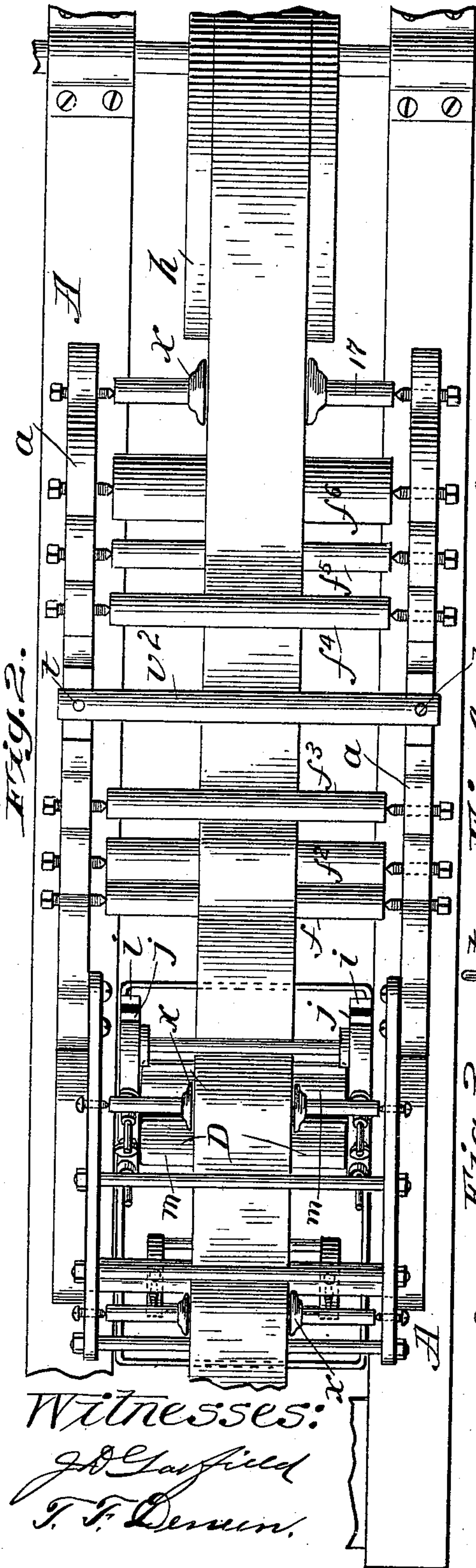
G. W. BISHOP, Dec'd.

S. E. BISHOP, Administratrix.

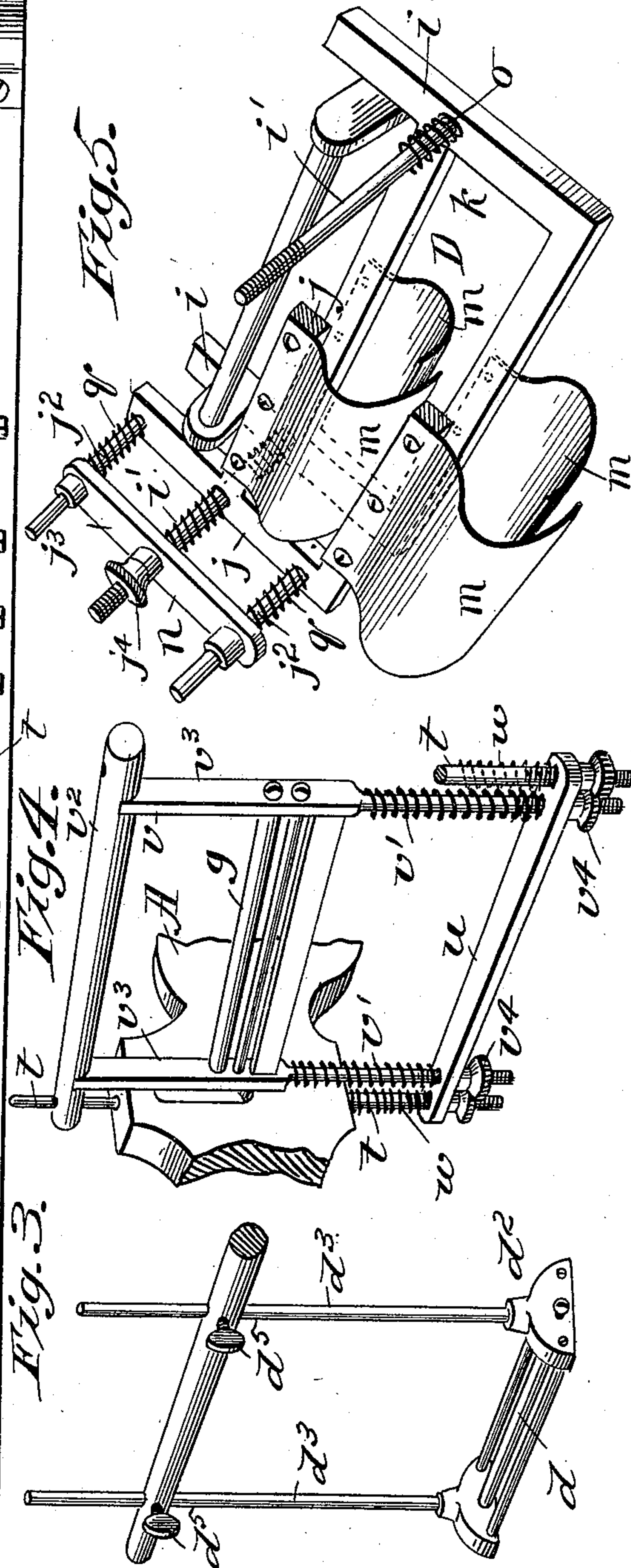
METHOD OF AND APPARATUS FOR MAKING INKED RIBBONS.

No. 488,786.

Patented Dec. 27, 1892.



Witnesses:
J. H. Garfield
T. F. Derrin.



Sarah E. Bishop,
Administratrix of Estate of
Geo. W. Bishop - Inventor,
per Chapin & Co. Attys.

(No Model.)

3 Sheets—Sheet 3.

G. W. BISHOP, Dec'd.

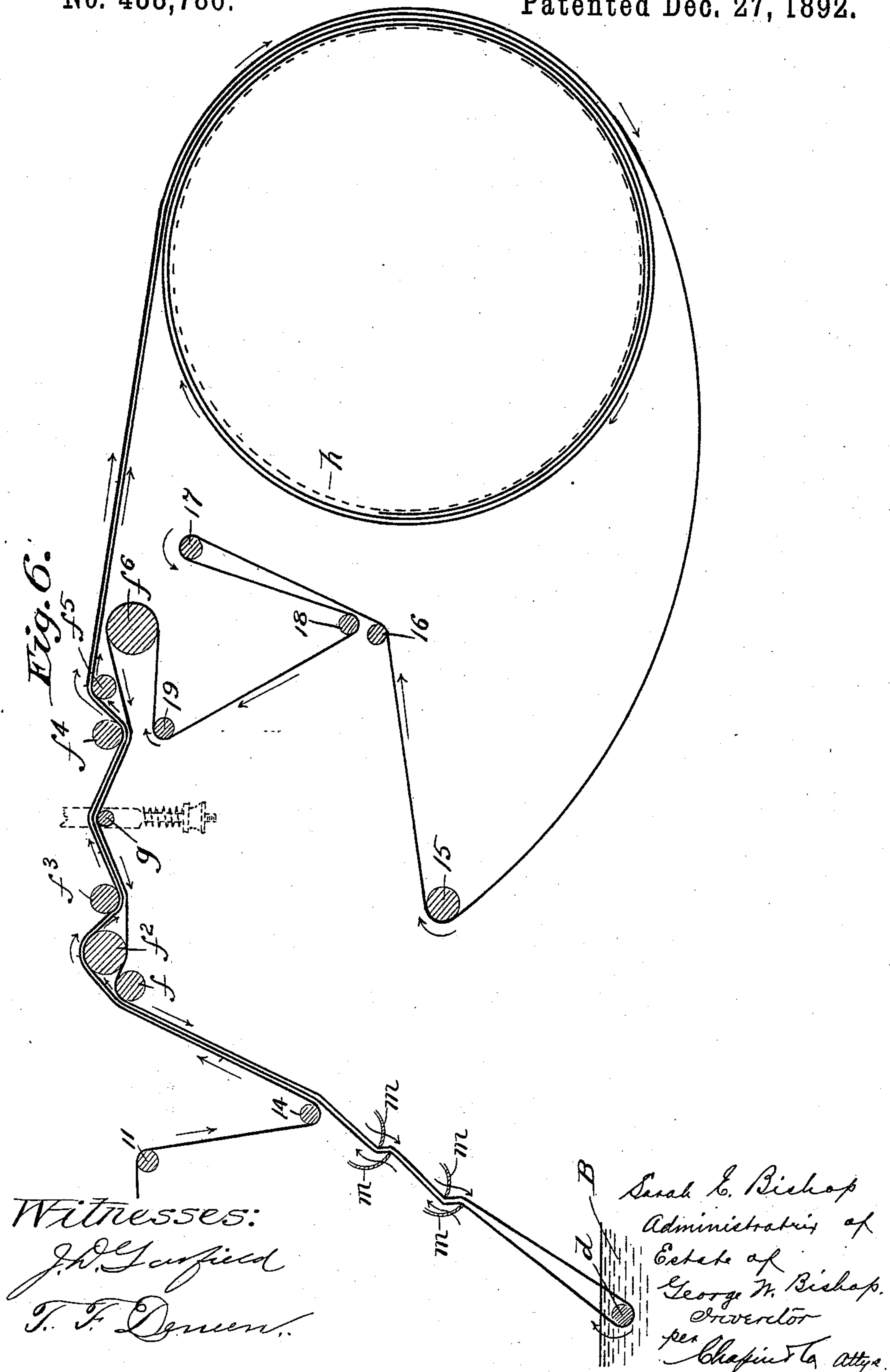
S. E. BISHOP, Administratrix.

METHOD OF AND APPARATUS FOR MAKING INKED RIBBONS.

No. 488,786.

Patented Dec. 27, 1892.

Fig. 6.



UNITED STATES PATENT OFFICE.

SARAH E. BISHOP, OF SPRINGFIELD, MASSACHUSETTS, ADMINISTRATRIX OF
GEORGE W. BISHOP, DECEASED.

METHOD OF AND APPARATUS FOR MAKING INKED RIBBONS.

SPECIFICATION forming part of Letters Patent No. 488,786, dated December 27, 1892.

Application filed January 8, 1892. Serial No. 417,423. (No model.)

To all whom it may concern:

Be it known that I, SARAH E. BISHOP, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, administratrix of the estate of GEORGE W. BISHOP, deceased, late of Jersey City, Hudson county, and State of New Jersey, and a citizen of the United States, do hereby declare and say that the said GEORGE W. BISHOP in his life-time invented new and useful Improvements in Methods of and Apparatus for Making Inked Ribbons, of which the following is a full, clear, and exact description.

The object of this invention is to devise an improved method of, and means for, impregnating or saturating ribbons for type-writing machines, hand-stamps, &c., with the inking material or composition, an essential in the result being a thorough and uniform application of the inking substance throughout all parts of the ribbon.

The improved method of inking a ribbon in accordance with this invention consists in immersing an intermediate portion of the ribbon in a liquid inking material or compound, and passing and moving such portion between layers or portions of the ribbon which are disposed at different sides thereof, and at the same time imparting a pressure or tension for the contact of the adjacent outer portions of the ribbon upon the said intermediate portion.

The improved method of inking a ribbon under this invention further consists in immersing an intermediate portion of the ribbon in a liquid inking material or compound then expressing a portion of the absorbed material from the immersed ribbon portion and passing and moving such portion between layers or portions of the ribbon which are disposed at different sides thereof, and at the same time imparting a pressure or tension for the contact of the adjacent outer portions of the ribbon, upon the said intermediate portion.

The improved method of inking a ribbon fabric involving the invention may be otherwise stated as consisting in immersing the fabric in a liquid inking material or compound, then expressing a portion of the absorbed ma-

terial from the immersed fabric, then passing the latter against a layer of similar fabric, and imparting a pressure contact upon the adjacent fabrics and a rubbing movement of the one relative to the other.

The invention, as related to the apparatus for carrying out the process consists of combinations and arrangements of parts all substantially as will hereinafter fully appear and be set forth in the claims.

In the accompanying drawings the apparatus is illustrated, and the improved method of inking the ribbon will be made manifest conjointly with the description of the construction and operation of the apparatus, and in said drawings.

Figure 1 is a sectional elevation of the machine showing the arrangement and course of the ribbon in and through the same. Fig. 2 is a plan view. Figs. 3, 4 and 5 are perspective views in illustration of parts which will be hereinafter more particularly described. Fig. 6 is a view in the nature of a diagram, in many respects resembling Fig. 1, to more clearly indicate the particular preferred course of the ribbon through the machine and the disposition of parts or sections of the ribbon relative to each other.

In the drawings, A A represent the framing of the machine consisting of parallel side uprights, *aa*, and cross members or braces, *bb*.

B represents a vat or tank for holding the inking material or composition supported within which is the horizontal cross member, *d*, preferably a roller. This roller is mounted for free rotation on the frame, *d*², which comprises the posts, *d*³ *d*³, that pass through apertures therefor in the cross rod, *b*⁴, which forms a part of, or is supported by the main frame. The posts, *d*³, *d*³, are held in adjustment at any height in the tank by the set screws, *d*⁵, *d*⁵.

Intermediately of the machine at an upper portion are ribbon supporting and tension rolls, *f*, *f*², *f*³, and *f*⁴, *f*⁵, and *f*⁶ all free to rotate and intermediate of said sets of rolls is a tension roll, *g*, which exerts an upward yielding pressure. The ribbon is indicated as drawn from a roll at the left and finally taken up by the wheel or drum, *h*, at the right.

Scraper devices for acting on the ribbon are

indicated at D, and there are various other guide and tension rolls advantageously embodied and arranged in the machine as will be incidentally mentioned in connection with the description of the course of the ribbon to be treated.

The end portion of the ribbon is drawn off from the supply roll at *c*, and carried over the rolls, 10, and 11, and under the intermediate stay or brace rods, thence down under and upwardly from the roll, 14, adjacent the scrapers to and over the rolls, *f* and *f*², and under and in contact with the roll, *f*³, over roll, *g*, under roll, *f*⁴,—and over roll,—*f*⁵, to encircle by a bight the take up drum, *h*; the ribbon then passes rearwardly around the roll, 15, forwardly to and around the roll, 16, upwardly around the roll, 17, and downwardly to and around the roll, 18, thence rearwardly and upwardly around the roll, 19, forwardly to and around the roll, *f*⁶, thence under rolls, *f*⁵, and *f*⁴, and over and in contact with the tension roll, *g*, thence rearwardly under rolls, *f*³, and *f*²,—in contact with the latter and in contact with and over and rearwardly from the roll, *f*, thence downwardly and rearwardly past and adjacent the roll, 14, under and upwardly around and in contact with the submerged roll, *d* in the vat, D; the ribbon thence passes upwardly and forwardly again in contact with the said roll, 14, over roll, *f*, and *f*²,—in contact with the latter and under and in contact with roll, *f*³, thence above and adjacent the tension roll, *g*, under and adjacent the roll, *f*⁴, over and in contact with roll, *f*⁵, and thence extended to and closely around the take up drum, being bound by its very extremity to the rim of the latter.

For convenience and brevity of description the portion of the ribbon between the ribbon supply roll and take up roll will be termed the upper layer,—that between the take up and the roller *d*, in the order of description above, the under layer, and that the course of which was laterally described as extending from the roller, *d*, forwardly to and in encircling engagement with the take up drum, the middle layer.

Rotation of the drum by means of the crank, *h*², insures a winding of the ribbon upon the drum and a forward travel of the middle layer from the place of immersion at the roller, *d*, portions of the middle layer being in close contact with the upper and lower layers or both as seen at different sections of the course between the roll, 14, and the roll, *f*⁶, and said layers are forced with some pressure the one upon the other by the supporting and tension rolls. The under layer has, as the middle layer travels forwardly a rearward travel and rubbing contact upon the middle layer, while at the same time the upper layer has the contact with the middle layer its travel is forward and practically at the same rate as that of the middle layer.

All parts of the ribbon are given the same

speed during the operation of the machine, the middle layer being wound onto the drum just so fast as the upper layer is withdrawn from the supply. The portion of the ribbon is continued from the upper layer or course around the drum slack, so that as the inked ribbon enlarges the drum, so to speak, no impediment or bind will be imparted by the encircling portion of the first course of the ribbon. The said slack portion under the operation of the machine will never be drawn taut, because the draft tension on said slack portion by the feed and pressure rolls insures its travel only at the same rate of speed as the other portions of the ribbon are run. The ribbon after being immersed in the vat containing the inking composition is next relieved of considerable portion of the coloring matter which it has absorbed on being brought subject to the action of the scrapers which insures in a degree a forcing in and evening of the divisible coloring matter retained within the interstices of the fabric, and a uniformity is further imparted in the impregnation of the ribbon by the inking matter owing to the contact and rubbing action of the one layer upon the other. Thus while it is seen that the middle layer becomes perfected as described the upper and lower layers receive by absorption and the rubbing-in process a certain amount of the coloring matter before the time of their immersion.

In practice a course of the ribbon from the supply roll to the take up drum the same being intermediately disposed and treated as described, insures the complete and uniform inking of the roll.

After having "threaded" the machine, as the carrying through of the ribbon in the manner described is termed, it is desirable to permit the layers of ribbon to remain in the arrangement described and when it is desired to remove the inked ribbon from the drum such may be done by cutting with a shears one or more thicknesses of the ribbon which is wound around the drum and then drawing the so wound portion off therefrom. It will be noticed that a portion of the rim of the take up drum is constituted by the movable section, *h*³, which is held in place by the key or wedge, *h*⁴. On desiring to insert a scissors for cutting one or more of the ribbon convolutions the movable section is inwardly forced.

The drum may constitute a measuring wheel, one convolution of ribbon thereon being of the desired marketable length.

The scraper device, D, embodies lower and upper frames, *i*, *j*, obliquely disposed in parallelism adjacent and at an inclination corresponding to the course of the lower and middle ribbon layers, the lower one being secured to the framing of the machine, and the upper one mounted for a yielding movement toward and away from the lower one. Said frames each carry a couple of scraper-blades, *m*, each of which blades is curved or inclined

angularly to the general plane of travel of the ribbon and the blades have their edges extended from the frame carrying them slightly beyond the said general plane of travel of the ribbon. The lower frame has at its ends the rigid posts, i' , i' , which extend through and beyond apertures therefor in the upper frame, and have their extremities screw threaded. The upper frame has at each end the pair of rigid upwardly extended posts, j^2 , j^2 ; and n , represents a bar at each end of the scraper device having holes through it for the free passage of the posts, j^2 , j^2 , and i' , through them. o , represents a spring surrounding the post and exerting a pressure to force the upper frame away from the lower. The bar, n , is restrained in any adjusted position along the said posts by the nut, j^4 , and the springs, q q , resisted by the upper bar exert a pressure upon the upper frame to force it inwardly and in counter action to the spring, o . For expressing a greater part of the ink composition from the ribbon the nut is turned down and the offset of the edges of the adjacent scrapers become increased and the springs all becoming more compressed the movable scraper frame is less sensitive, and has its yielding movement against a greater spring stress. The turning of the nut effects the automatic regulation of all of the springs. The tension device between the sets of rolls, f , f^2 , and f^3 , and f^4 , f^5 , and f^6 , will be now described in detail.

t t represent posts or rods which extend vertically both above and below the upper middle portion of the framing at each side of the machine. The pending members of said rods support a cross bar, u , which is vertically adjustable thereon.

v represents a frame having its upper cross bar, v^2 , apertured for a vertical play upon the upper projected portions of the rods, t t , and the pending members, v^3 , of the said frame which are carried by the cross member, v^2 ,—pass loosely through and below apertures in the said lower cross bar, u . The spiral springs, v' , encircling the pending frame members, v^3 , exert an upward forcing action upon the frame, the springs being at their lower ends resisted by the cross bar and bear at their upper ends against the shoulders of the said pending frame members to force the frame upwardly. The lower ends of the spindle formed members are provided below the bar, u , with the nuts or stops, v^4 . The aforesaid tension roll, g , is supported between the pending members, v^3 , of said frame, v . The lower extremities of the vertical rods, t , t , are screw threaded they passing loosely through and below the bar, u , receiving the nuts thereon, as shown, which usually remain very near the lower ends of said rods. Spiral springs, w , are provided to encircle the rods, t , bearing between the lower edges of the framing, A , and the bar, u , for exerting a downward pressure on the latter. Said springs, w , are

regarded advantageous, as they most quickly and positively force the bar downwardly relative to the pending portions of the rods, t , and decrease the liability of said bar becoming cramped or bound when the nuts thereunder are turned to lessen the tension, which latter result is accompanied by so lowering the bar on or relative to the rods and parts, t , t , and v^3 , v^3 , as to increase the distance between the bar, u , and the shouldered portions of said parts, v^3 .

Certain of the rolls over which the ribbon is guided have collars, x , closely fitting thereon and adapted by friction to be held in place when adjusted and also adapted to be slid outwardly or inwardly on the rolls to form guides or guards for ribbons of different widths all so that the layers as above described will be, the one exactly over another.

Having thus described this invention what I claim as the invention of the late GEORGE W. BISHOP is:—

1. The improved method of inking a ribbon which consists in immersing an intermediate portion of the ribbon in a liquid inking material or compound, and passing and moving such portion between layers or portions of the ribbon which are disposed at different sides thereof, and at the same time imparting a pressure or tension for the contact of the adjacent outer portions of the ribbon upon the said intermediate portion, substantially as described.

2. The improved method of inking a ribbon which consists in immersing an intermediate portion of the ribbon in a liquid inking material or compound, then expressing a portion of the absorbed material from the immersed ribbon portion and passing and moving such portion between layers or portions of the ribbon which are disposed at different sides thereof, and at the same time imparting a pressure or tension for the contact of the adjacent outer portions of the ribbon, upon the said intermediate portion, substantially as described.

3. The improved method of inking a ribbon which consists in passing the ribbon through a liquid inking material or compound, then expressing a portion of the absorbed material from the immersed ribbon then passing the latter against a layer of similar fabric and imparting a pressure contact upon the adjacent fabrics and a rubbing movement of the one relative to the other substantially as described.

4. In a ribbon inking machine the combination with an ink vat and means for guiding the ribbon thereto and therefrom, and a fixed scraper blade supported edgewise relative to the course of the ribbon of a movably mounted scraper blade also mounted edgewise to the course of the ribbon having springs applied thereto for exerting a pressure thereon away from the fixed blade, and counterbalancing springs for exerting a pressure thereon to-

ward the fixed blade, and means for placing all of the said springs under a greater or less compression, substantially as and for the purpose described.

5 5. In a ribbon-inking machine the combination with a blade and a support on which the same is mounted having the posts extended therefrom with their extremities screw threaded, of the movable frame having the scraper-
10 blade thereon and having the posts at its ends, of the bar apertured and fitted over the said posts, the thumb-nut, and the spring between the two blade-supports, and one or more springs between the movable blade-support
15 and the said bar, substantially as described.

6. In a ribbon-inking machine, the combination with the vat for the inking material having a roll or rod therein, of several guide rolls above
20 the vat, and a means for causing the travel of the ribbon whereby an upper layer thereof may be drawn past and in engagement with said rolls and other rolls in proximity to said rolls with which one or more other layers may
25 have guiding and tension engagements, and by which said layers may have rubbing movements one upon another in opposite directions, and scraper-blades located above the vat in proximity to the course of movement

of one of the ribbon layers, substantially as and for the purposes set forth. 30

7. In a ribbon-inking machine the combination with a vat for holding inking material having a transverse member submerged therein, of a take up drum, separated sets of guide
35 rolls and a yielding tension roller intermediate thereof and a scraper device between the vat and said rolls, substantially as and for the purpose set forth.

8. In a ribbon-inking machine the combination with an ink-vat and means for guiding
40 and moving the ribbon into and away from same, of sets of guide rolls, and a tension device, intermediate thereof, consisting of a bar or roller and a carrier therefor which is mounted for a movement at an angle to the
45 travel of the ribbon through said guide rolls and a spring for imparting a yielding resistance to said support, substantially as described.

SARAH E. BISHOP,
Administratrix of the estate of George W. Bishop.

Witnesses:

WM. S. BELLOWES,
THERESA F. DENEEN.