

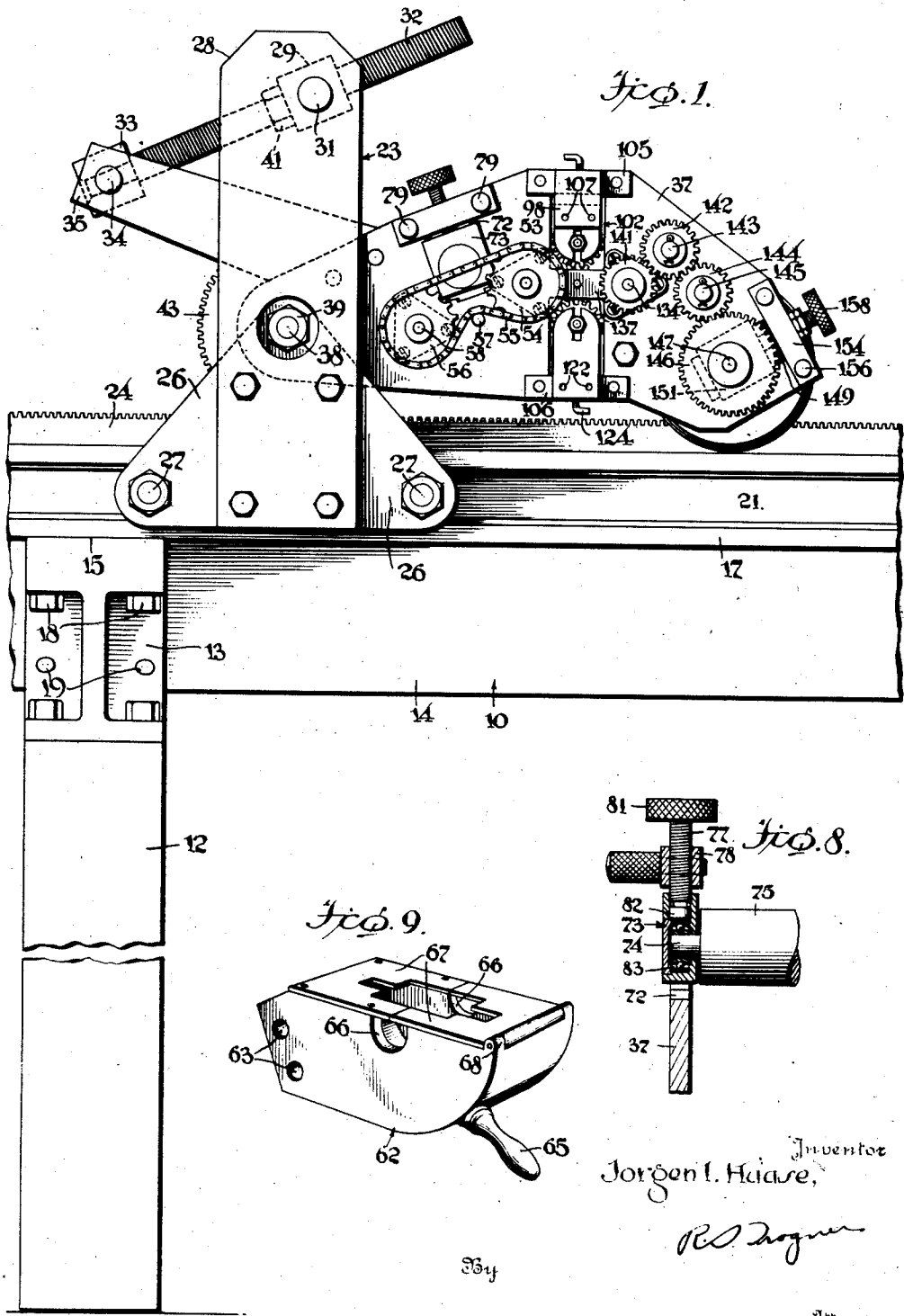
Sept. 11, 1928.

1,683,774

J. I. HAASE
PRINTING MACHINE

Filed Aug. 3, 1926

3 Sheets-Sheet 1



Sept. 11, 1928.

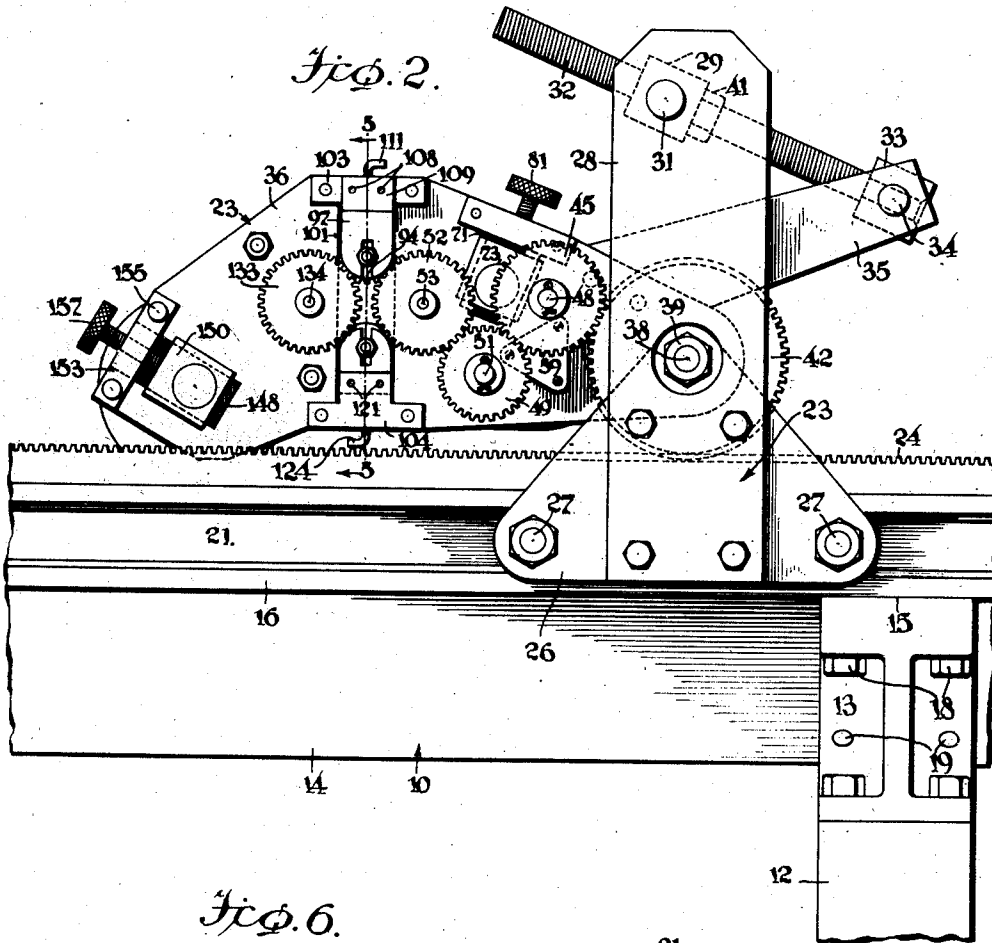
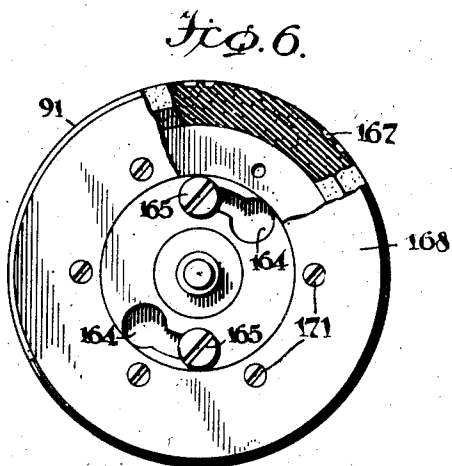
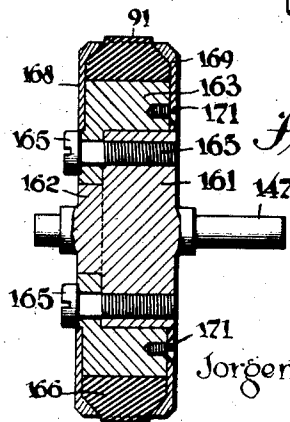
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3 Sheets-Sheet 2



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PRINTING MACHINE

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3 Sheets-Sheet 3

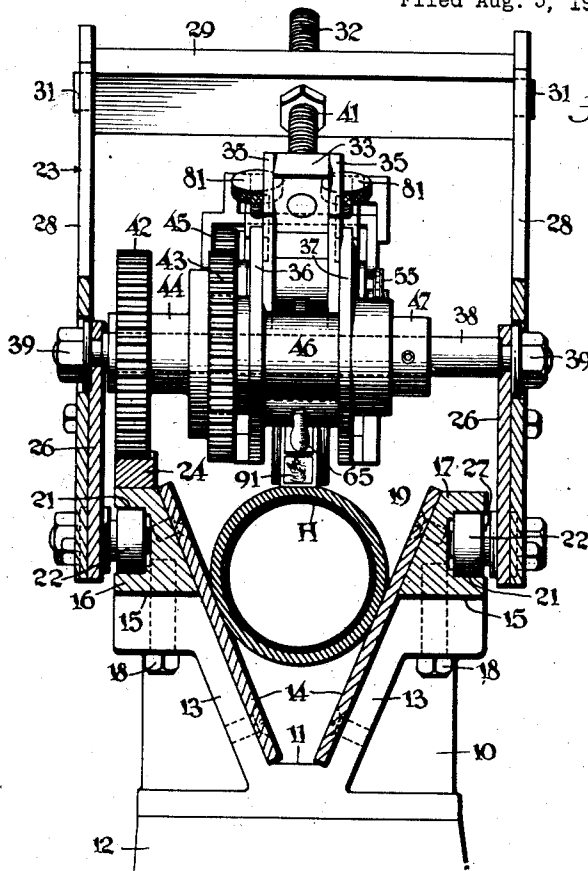


Fig. 3.

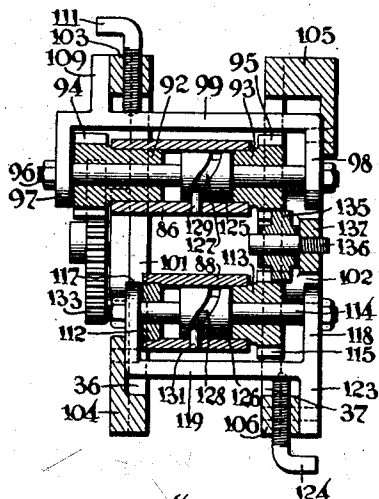


Fig. 5.

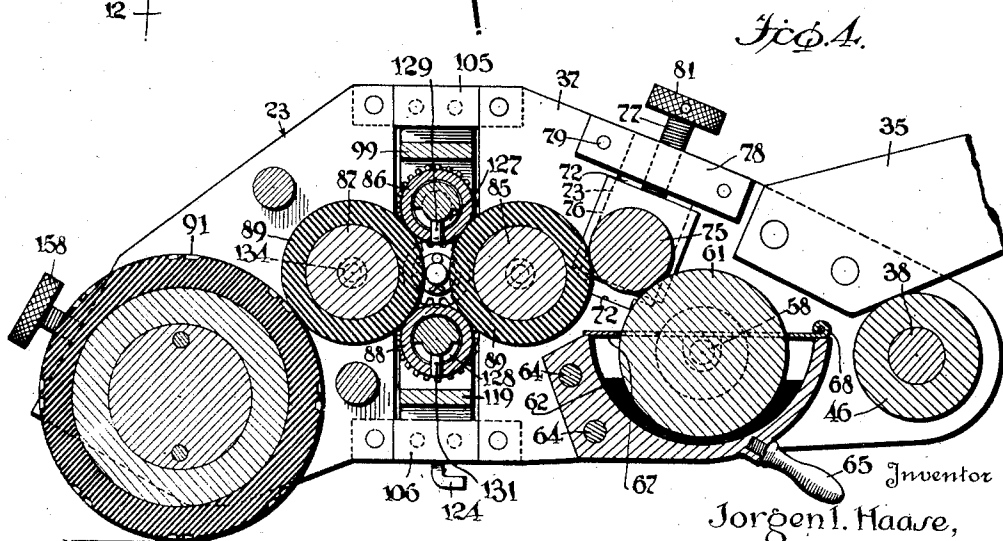


Fig. 4.

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UNITED STATES PATENT OFFICE.

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PRINTING MACHINE.

Application filed August 3, 1926. Serial No. 126,819.

My invention relates to printing machines, and it has particular reference to a machine for marking an article at predetermined intervals along the surface thereof.

5 The principles of the invention are herein explained as they are incorporated in a machine for printing dimensional index lines, trade marks, or similar matter, upon the surface of resilient material such as hydraulic hose. Garden hose, for example, is usually bought in random lengths from the manufacturer, and it is sold by the dealer in such short definite lengths as the purchaser desires.

15 Sales of this character may be facilitated if lines, indicating definite units of length, are printed or are otherwise marked on the surface of the article. However, it is apparent that the lines must be accurately positioned, in order that they may serve their intended purpose. Trade marks, the name of the dealer, or like information tending to protect the purchaser and to enhance the possibility of the sale, may also be printed on the article.

25 The primary object of the invention resides in the provision of a machine by means of which such information may be accurately applied to the article. Various specific objects, and the advantages to be derived from the practise of the invention, will become apparent from a perusal of the following detailed description of a preferred form of construction, illustrated in the accompanying drawing, wherein;

35 Fig. 1 is a fragmentary side elevational view of the machine;

Fig. 2 is an elevational view, taken from the opposite side;

40 Fig. 3 is a view, partially in end elevation and partially in cross-section, as observed from the rear of the machine;

Fig. 4 is a longitudinal cross-sectional view of some of the mechanism shown in Fig. 2, drawn on a slightly larger scale;

45 Fig. 5 is a transverse cross-sectional view of certain elements, taken along the line 5-5 of Fig. 2;

Fig. 6 is a side elevational view of the printing roller, parts being broken away;

50 Fig. 7 is a cross-sectional view of the roller shown in Fig. 6;

Fig. 8 is a fragmentary cross-sectional view of a bearing member; and

Fig. 9 is a perspective view of the ink reservoir or fountain.

In a general aspect, the machine comprises a frame or a carriage, having the printing elements mounted therein, which may be moved bodily along a random length of hose or other article to be marked. During the movement of the carriage, a printing roller is caused to rotate in contact with the hose, and to print dimensional lines and trade marks at predetermined regular intervals thereon.

The carriage is mounted for movement along a support or frame 10, that is provided with a V-shaped channel 11 for the reception of a length of hose H, and which is supported from the floor by means of suitable legs 12. The sloping flanges 13 of the channeled member 10 have affixed thereto thin plates 14, which project above the upper face 15 of the frame 10, and which abut a pair of tracks 16 and 17, respectively disposed upon the face 15 along the flanges 13. Suitably positioned bolts 18 and screws 19 are provided to hold the tracks rigidly to the support.

80 The tracks 16 and 17 have formed therein guides 21, of rectangular configuration, that receive pairs of rollers 22 which support a movable carriage, indicated generally by the reference numeral 23. A rack 24 is secured to the track 16 for engagement with a gear positioned on the carriage, and for a purpose that will become apparent presently.

85 Triangularly shaped plates 26, provided with stub shafts 27 at their lower apices for the reception of the rollers 22, are disposed at either side of the support 10, and they have secured thereto oppositely disposed upwardly extending members 28 providing a means for supporting the remaining elements of the carriage. A bar 29, extending between the members 28 near the upper ends thereof, is mounted therebetween by means of trunnions 31 that project into aligned apertures formed in the upright members 28.

90 A screw threaded rod 32 passes through the bar 29, and it terminates at the rear portion of the machine in a block 33, provided with trunnions 34 that are rotatably mounted in a pair of levers 35, that are respectively bolted to oppositely disposed side plates 36 and 37 of the main portion of the carriage 23. Both plates are pivotally mounted on a

fixed shaft 38 that is secured between the upright members 28, by means of nuts 39. It will be noted that the center of gravity of the system pivotally mounted on the shaft 38 is so located as to cause the plates 36 and 37, with their attached parts, to move downwardly toward the hose H disposed in the support 11. A nut 41, positioned on the screw threaded member 32, serves to limit the motion of the pivotally mounted carriage, and it also provides a means to hold the carriage in any desired angular position relative to the support.

A pair of gear wheels 42 and 43 are integrally secured to a common hub 44 which is rotatably mounted upon the shaft 38. The outer gear wheel 42 engages the rack 24 mounted upon the track 16, and the inner gear wheel 43 engages a gear wheel 45 secured to the outer face of the plate 36, for the purpose of causing rotation of the various rollers mounted between the plates 36 and 37, when the carriage is moved along the tracks. The carriage plates 36 and 37 are spaced by means of a collar 46 disposed on the shaft 38, and they are maintained in proper position with respect to the gear wheels 42 and 43 by means of a collar 47 positioned on the shaft adjacent the plate 37.

The gear wheel 45, which is mounted upon the plate 36, by means of a stub shaft 48, (Fig. 2) intermeshes with a gear wheel 49, that is likewise mounted upon a stub shaft 51. This gear, in turn, meshes with a gear wheel 52 that is keyed to one end of a shaft 53, rotatably mounted between the plates 36 and 37. The shaft 53 has a sprocket wheel 54 keyed to its opposite end, as shown in Fig. 1, for the reception of a chain or link belt 55 that passes around a similar sprocket wheel 56 and over an idler pin 57 secured to the plate 37. The sprocket wheel 56 is keyed to a rotatably mounted shaft 58 that terminates in a bearing 59 secured to the carriage plate 36.

A roller or immersion wheel 61 is formed integrally with the shaft 58 at the mid portion thereof, and it is adapted to dip into a supply of printing ink disposed in a reservoir or cup 62. The cup, which may be of any desired configuration, is shown in perspective in Fig. 9, and, as there illustrated, it is provided with apertures 63 for the reception of dowel pins 64 by means of which it is secured to the carriage 23. A handle 65 is attached to the lower side of the cup to facilitate removal when the dowel pins are withdrawn. Grooves 66 are formed in the opposite walls of the cup, for the accommodation of the shaft 58, and a two part cover 67, one portion of which is hinged to the cup, as indicated by the reference numeral 68, is also provided to prevent the ink from splashing when the wheel 61 is rotated.

The side plates 36 and 37 are provided

with rectangular slots 71 and 72 for the reception of similarly formed bearing blocks 73, in which is mounted a shaft 74 having an idle roller 75 keyed thereto. As best illustrated in Figs. 4 and 8, each block 73 is provided with oppositely disposed channeled portions 76 which engage the wall of the slot, and with an adjusting screw 77 that passes through a threaded aperture in a bar 78 adapted to fit over the walls of the slot. Dowel pins 79 are provided to secure the bar 78 to the carriage.

Movement of each block 73 within the slots 71 and 72 is effected by turning a knurled thumb nut 81 secured to the upper end of the screw 77. The lower end of the screw is rotatably connected to the block 73, as indicated at 82. Each block has a self-aligning ball bearing 83 positioned therein, in which is journaled one end of the shaft 74. With this construction, it will be apparent that the roller 75 may be disposed in contact with the immersion wheel 61 with a variable degree of pressure, and that a continuous contact is obtainable by virtue of the provision of the independently adjustable bearings 83.

From the construction as thus far described, it will be seen that as the carriage 23 is moved along the support 10, a definite rotation is imparted to the immersion wheel 61, by the rotation of the gear wheel 42 engaging the rack 24, and the coincident rotation of the train of gears 43, 45, 49, and 52, and the sprocket wheels 54 and 56. The wheel 61, as it rotates in the reservoir 62, conveys a certain amount of ink to the roller 75, which is likewise constrained to rotate by virtue of its frictional engagement with the roller 61. The roller 75 in turn transmits the ink to a system of rollers that are adapted to reduce the ink to a uniform consistency, and then to transmit it to a printing roller.

The ink reducing system consists of a plurality of tangentially disposed rollers 85, 86, 87 and 88, illustrated in Fig. 4. Rollers 85 and 87 are covered with rubber composition 89, to facilitate the spreading of the ink, and they are mounted between the plates 36 and 37 for rotational movement only. Rollers 86 and 88 each contact with the rubber covered rollers, and they are adapted to have a lateral motion, as well as a rotational movement, in order to thin the ink to a uniform consistency. Roller 75, which receives the ink from the immersion wheel 61, contacts with roller 85 to transmit the ink to the system, and roller 87 is disposed tangentially to a printing roller 91, by means of which the ink is applied to the hose H.

As illustrated in Fig. 5, the roller 86 is formed from a hollow cylinder provided with hubs 92 and 93 forced into the oppo-

site ends of and projecting beyond the cylinder, and which respectively have formed thereon pinion gears 94 and 95. The hubs are provided with aligned apertures providing bearings for an axle 96 which is secured in opposite downwardly turned arms 97 and 98 of a housing 99, positioned between a pair of oppositely disposed slots 101 and 102 respectively formed in the plates 36 and 37.

For convenience in assembly, the plate 36 is formed in two sections which terminate at the slot 101, and which are secured together by means of bridging members 103 and 104, that are riveted to the upper and lower portions of the plate 36. Likewise, the plate 37 is provided with sectional portions connected by means of similarly disposed upper and lower bridging members 105 and 106. The bridge 105 is provided with apertures 107 for the reception of dowel pins formed on the flange 98 of the housing 99, and the bridge 103 is provided with dowel pins that project into aligned apertures 108 formed in a flange 109 that projects upwardly from the housing 99. A screw 111 is also provided to project through the bridge 103 into the housing 99, to hold this member in fixed relation to the frame of the carriage.

The lower roller 88 is removably mounted on the carriage 23 in a manner similar to that just described in conjunction with roller 86. This roller is also formed from a cylindrical shell, and it is provided with hubs 112 and 113, that are loosely mounted upon an axle 114. It will be observed that the lower roller is, however, provided with but one pinion gear 115, formed on the hub 113, and that the hub 112 does not project beyond the shell. The reason for this construction will become apparent when considering the gear train by means of which the rollers are driven.

The axle 114 is secured to the upwardly turned flanges 117 and 118 of a housing 119 that is removably secured to the bridges 104 and 106. Dowel pins are attached to the flange 117, which project into aligned apertures 121 formed in the bridge 104, and similar pins, disposed in the bridge 106, are adapted to enter apertures 122 formed in a downwardly projecting flange 123 of the housing 119. A screw 124, similar to the screw 111, is also provided to secure the housing 119 to the carriage.

The axles 96 and 114 have secured thereto collars 125 and 126 respectively, in which are cut diagonally disposed cam slots 127 and 128. Pins 129 and 131, respectively secured in the shells 86 and 88, enter the cam slots 127 and 128 to cause a lateral movement of the rollers as they are rotated. It will be seen that as the hollow rollers 86 and 88 revolve about the axles 96 and 114, that the

pins are constrained to follow the slots 127 and 128, and thus move the rollers 86 and 88 alternately toward the plates 36 and 37.

The reducing rollers 85, 86, 87 and 88 are positively driven by means of a system of gears that are actuated by the rotation of the gear wheel 52, keyed to the shaft 53 that supports the roller 85. As shown in Figs. 2 and 5, this gear wheel meshes with the pinion gear 94, which, in turn, meshes with a gear wheel 133 that is keyed to a shaft 134 projecting through the opposite plate 37, and which has the roller 87 secured thereon.

The oppositely disposed pinion gear 95, secured to the roller 86, intermeshes with an idle pinion gear 135 that is rotatably mounted on a stub shaft 136, positioned in a bar 137 that extends across the slot 102 formed in the plate 37. The pinion gear 135 meshes with the pinion gear 115 that is fixed to the roller 88.

As the gear wheel 52 is revolved, by actuation from the train of elements leading thereto from the rack 24, the roller 85 is likewise rotated, since both parts are keyed to the shaft 53. The roller 86 is revolved by means of the direct intermeshing of the pinion gear 94 with the gear wheel 52, and roller 87 is also rotated through the engagement of the pinion gear 94 and the gear wheel 133. Roller 88 is also revolved by actuation of the pinion gear 115 through the pinions 95 and 135. Rollers 85 and 87 have a motion of rotation only, but rollers 86 and 88 are given an additional lateral motion by the cams 127 and 128 to spread the ink transmitted to the system to a uniform consistency.

Roller 91, which receives the ink from roller 87 and applies it to the hose, is also given a definite rotation. This is accomplished by means of a gear wheel 141 that is keyed to the shaft 134 adjacent the plate 37, and which intermeshes with a pinion gear 142, mounted on a stub shaft 143 that is secured to the plate 37. The pinion gear 142 intermeshes with a similar pinion gear 144, mounted on a stub shaft 145, which, in turn, intermeshes with a gear wheel 146, keyed to a shaft 147 that supports the printing roller 91.

The roller 91 is adjustably and removably mounted in the carriage 23 by means similar to those employed for the mounting of the roller 75. Slots 148 and 149 are cut in the plates 36 and 37, and in them are disposed self aligning bearing blocks 150 and 151, secured against accidental displacement by means of bars 153 and 154, which are fixed to the frame members by means of dowel pins 155 and 156. Screws 157 and 158, having knurled heads, engage the blocks 150 and 151 and are provided to vary the pressure of the roller 91 against the roller 87.

The construction of the printing roller is

illustrated in Figs. 6 and 7. The shaft 147 has a large annular portion 161, provided with a collar 162 of slightly less diameter, formed integrally therewith. Disposed upon the annular portions 161 and 162 is a cylindrical member 163 which is provided with elongate slots 164 for the reception of screws 165 that serve to secure the parts together. A band of rubber composition 166 is disposed on the periphery of the member 163, and it has suitable lines or letters 167 formed in its outer surface for the purpose of marking the hose in the desired manner. The band is held in place by means of annular plates 168 and 169 which are attached to the member 163 by means of screws 171.

It will be noted that the outer band 166 of engraved material may be removed readily from the hub portion 161 of the roller, by turning the outer portion until the heads of the screws 165 are disposed in correspondingly enlarged portions of the slots 164. This construction is desirable to permit the installation of a roller of different dimension in place of the one removed. Similarly, the outer band of engraved rubber may be replaced with one having a different set of markings, by removing the plate 169.

From the foregoing description of the machine, it will be observed that the immersion roller, the reducing rollers, and the printing roller, are driven positively as the carriage 23 is moved along the support 10. The provision of a positive drive for the printing roller 91 is particularly desirable. Lines, placed at uniform distances around the periphery of the engraving band 166, successively contact with the hose at equal intervals. In practice, it has been found desirable to so dimension the gear wheels that dimensional marks are printed on the hose at intervals of one or two inches, for every inch of travel of the carriage along the support.

The ink is supplied to the printing roller at a uniform rate, due to the positive rotation of the immersion roller 61, and it is supplied with a uniform consistency due to its reduction by the spreading rollers 85, 86, 87 and 88.

It will be observed that many of the parts of the machine may be removed readily to facilitate cleaning thereof. The printing roller is so constructed that the impression surface may be replaced by one having different matter formed thereon.

In operation, ink is poured into the reservoir 62, a length of hose is positioned in the channel 11, as shown in Fig. 3, and the screw 41 is manipulated until the roller 91 bears against the hose with the desired pressure. The carriage is then moved back and forth to transmit an initial supply of ink to the printing roller, and then it is pushed along the entire length of the track, to cause rota-

tion of the various rollers, and to print dimensional lines, or other suitable matter, at regular and predetermined intervals along the surface of the hose.

It will be noted that the printing operation is not dependent upon the dimensions of the hose, and that a single machine has a sufficiently wide range of adaptability to mark all of the various sizes of hose usually manufactured.

It will be apparent to those skilled in the art that while but a single preferred form of the invention has been described, many modifications may be made in the structural details of the machine. Only those limitations should be imposed upon the invention as are set forth in the following claims.

What I claim is:

1. A printing machine comprising a support, a carriage movably mounted thereon, a frame pivotally connected to the carriage, a complete printing unit carried by the frame, and means for supporting the unit in adjusted operative positions.

2. A printing machine comprising a support, a carriage movably mounted thereon, a frame pivotally connected adjacent one of its ends to the carriage, a complete printing unit carried by the frame, and means for supporting the unit in adjusted operative positions.

3. A printing machine comprising a support, a carriage movably mounted thereon, a frame pivotally connected adjacent one of its ends to the carriage, a printing unit carried wholly by the frame, and means for supporting the unit and frame in adjusted operative positions with respect to the carriage and support.

4. A printing machine comprising a support, a carriage movably mounted thereon, a frame pivotally connected to the carriage, a complete printing mechanism carried by the frame, and means for supporting the frame and unit in a plurality of operative positions.

5. A printing machine comprising a support, a carriage movably mounted thereon, a frame pivotally connected to the carriage, a complete printing mechanism carried by the frame, means for supporting the frame and unit in a plurality of operative positions, and means whereby the mechanism is driven by movement of the carriage along the support.

6. A printing machine comprising a support, a carriage movably supported thereby, a frame pivotally connected to the carriage, a complete printing unit carried by the frame, means for supporting the unit in adjusted operative positions including lever arms secured to the frame and adjustable means interposed between the arms and the carriage.

7. A printing machine comprising a support, a carriage movably mounted thereon, a

- frame pivotally connected to the carriage, printing mechanism carried by the frame, means for supporting the frame in adjusted positions including a lever arm secured to the frame, a pair of blocks pivotally carried by the arm and carriage respectively, a threaded bolt slidably traversing one of the blocks and secured to the other block, and a nut on the bolt between the blocks.
- 5 8. A printing machine comprising a support for an article to be printed, a carriage movably mounted thereon, a frame pivotally connected adjacent one of its ends to the carriage, printing mechanism carried by the frame, means for supporting the frame in adjusted positions, including a lever connected to the frame, a bolt pivotally connected to the lever and slidably connected to the carriage, and means on the bolt for varying the minimum spacing of the lever and carriage.
- 10 In witness whereof, I have hereunto signed my name.
- JORGEN I. HAASE.