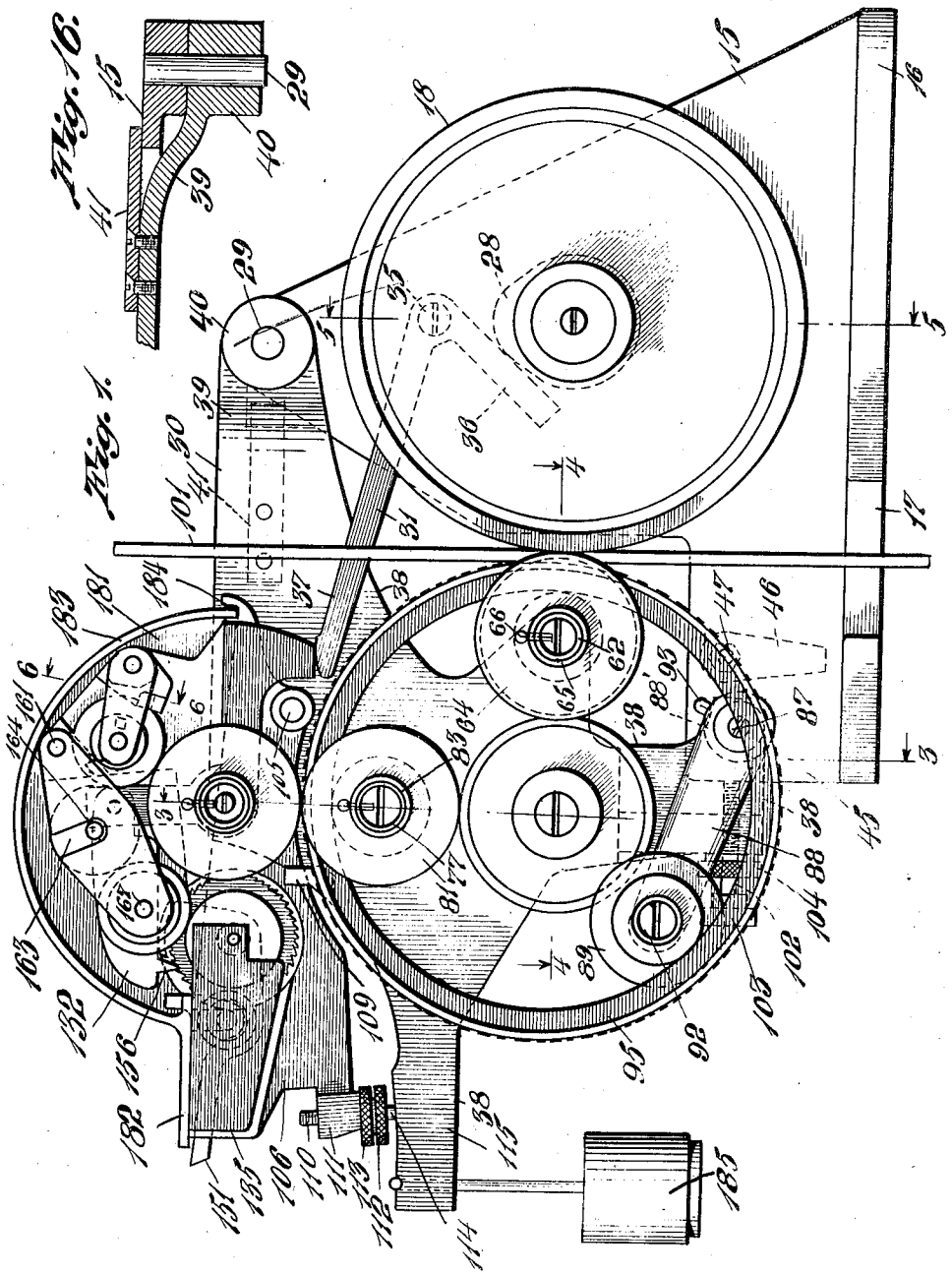
Aug. 20, 1940. C. J. ROHLAND 2,211,793

PRINTING MACHINE FOR LENGTHS OF MATERIAL

Filed Oct. 11, 1937 4 Sheets-Sheet 1

Fig. 1.



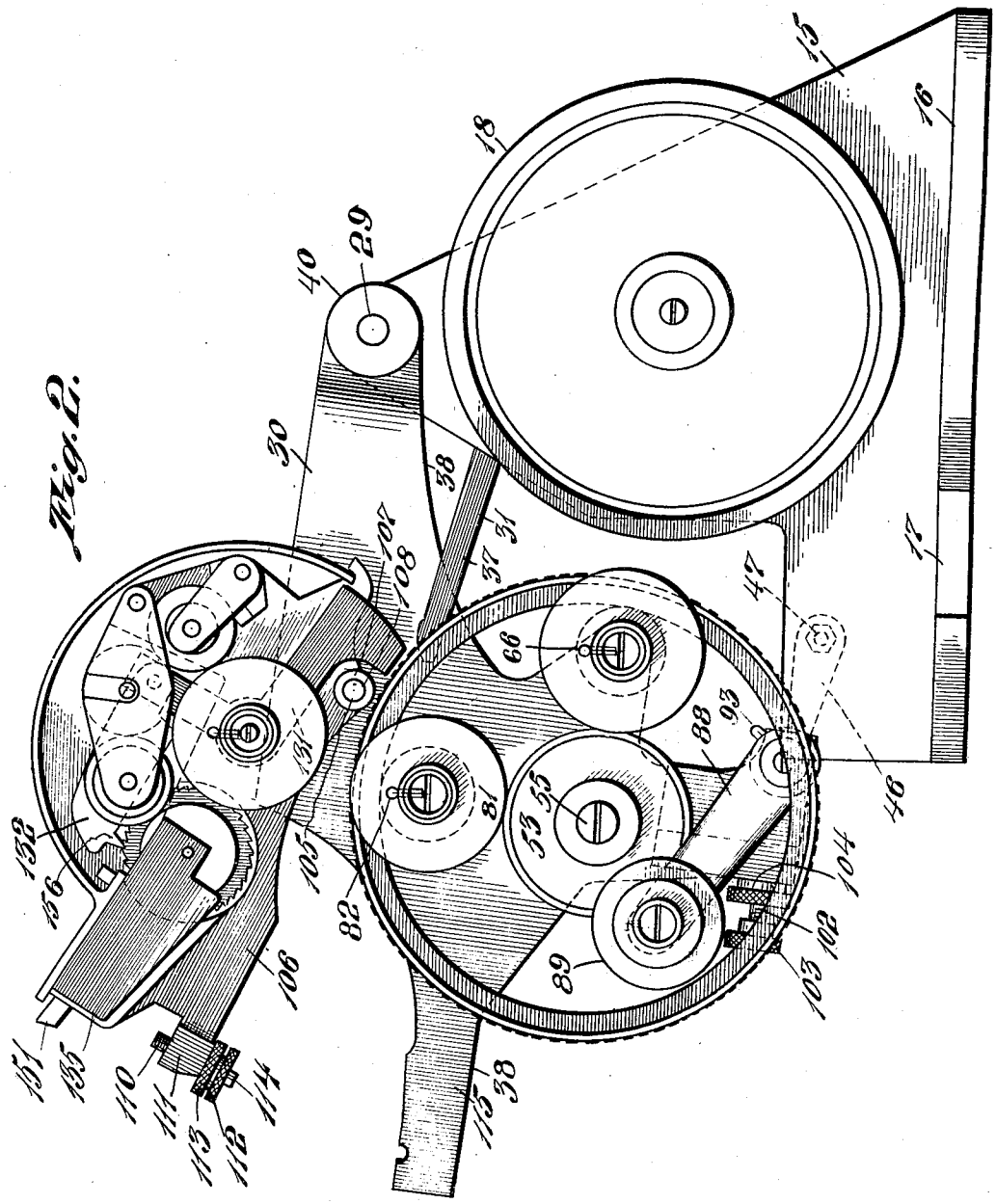
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PRINTING MACHINE FOR LENGTHS OF MATERIAL

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Fig. 2.



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PRINTING MACHINE FOR LENGTHS OF MATERIAL

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Fig. 3.

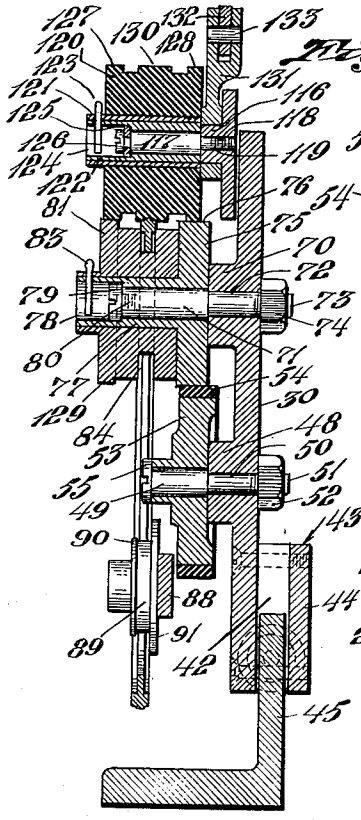


Fig. 4.

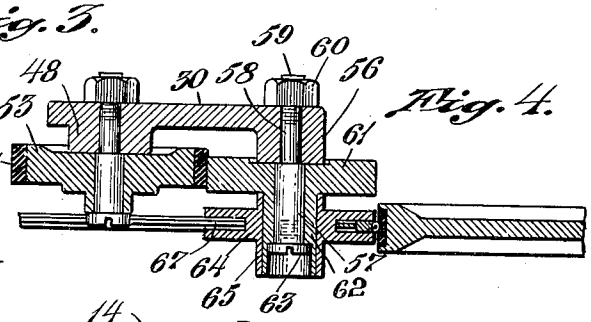


Fig. 5.

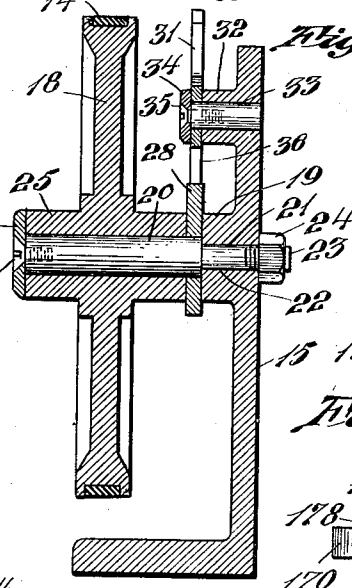


Fig. 6.

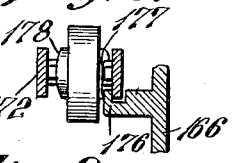


Fig. 9.

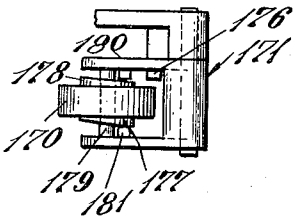


Fig. 7.

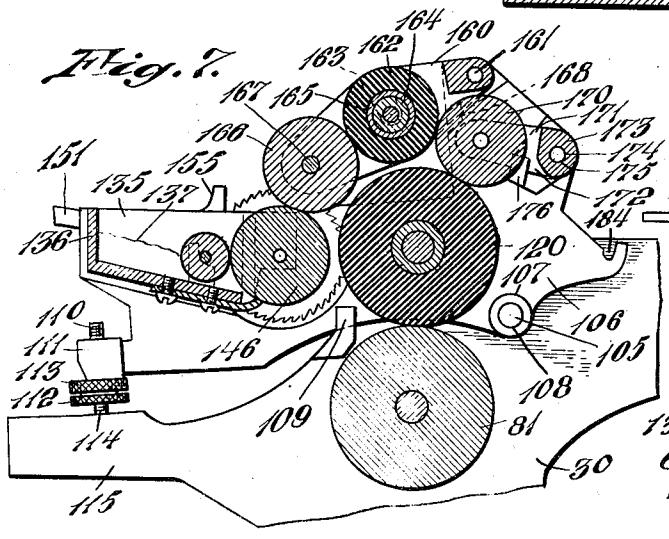
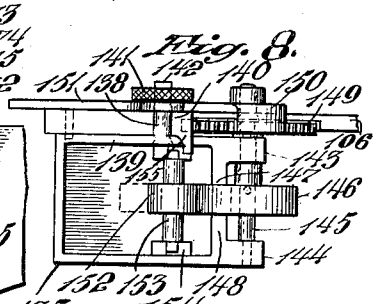


Fig. 8.



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PRINTING MACHINE FOR LENGTHS OF MATERIAL

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Fig. 10.

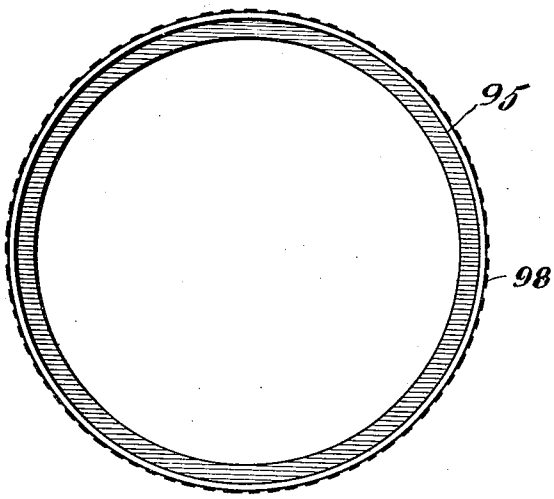


Fig. 11.

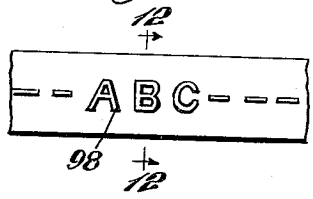


Fig. 12.

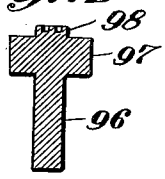


Fig. 13.

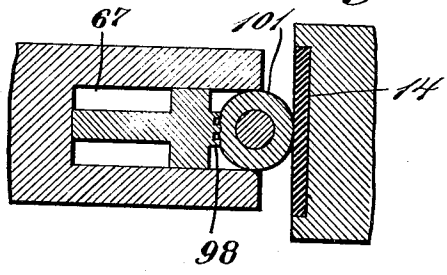


Fig. 15.

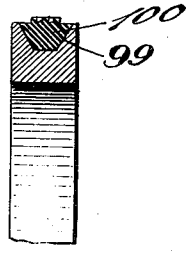


Fig. 14



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Patented Aug. 20, 1940

2,211,793

UNITED STATES PATENT OFFICE

2,211,793

PRINTING MACHINE FOR LENGTHS OF MATERIAL

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Application October 11, 1937, Serial No. 168,379

12 Claims. (Cl. 101—36)

This invention relates to a marking machine of the type suitable for marking running lengths of wire banding or other similar articles; and has for one of its objects the printing or impressing of characters upon the running length of wire or the like for the purpose of identification, measurement or other uses to which printing may be put upon such linear or running length of material.

Another object of the invention is the provision of an arrangement by which the insulating covering of electrical conductors may be marked without tearing, abrading, or rupturing the surface finish of these conductors even though they be printed freshly after being formed when they are somewhat tacky or easily moldable.

Another object of the invention is the provision of the printing character member which may be readily interchanged with other like members so that other characters may be applied by merely a simple interchange of members which carries the type or characters to be impressed or printed upon the work.

Another object of the invention is an arrangement so that work of different sizes or different diameter may be printed by the simple interchange of the type ring and its guides and supports.

Another object of the invention is to derive motion for all of the operating parts from the work as it passes through the machine with the more specific object of splitting up the transfer of motion so that its sources are from two different points on opposite sides of the work that an easier running action may be afforded.

Another object of the invention is the provision of a drive for the ink supply to the type separate and apart from the type so that the transfer of the ink onto the type or printing characters may be light while the drive may be more positive and in a balanced relation to the type by reason of firmer frictional contact between the driving parts.

Another object of the invention is the utilization of a large portion of the operating parts and their mounting as the pressure means for moving the type toward the support or back-up roll.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a side elevation of the machine in operating position and showing a fragmental portion of a wire as the work passes through the machine;

Fig. 2 is an elevation similar to Fig. 1 but showing the parts raised and supported in an inoperative position which may be desirable for changing the type ring and which by comparison with Fig. 1 affords a very good indication of the relative unit parts of the device;

Fig. 3 is a sectional view on line 3—3 of Fig. 1 which as will be seen is on a broken plane;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a section through the back-up wheel and on line 5—5 of Fig. 1;

Fig. 6 is a detail sectional view illustrating the locking mechanism of two of the relatively movable parts and is particularly a section on line 6—6 of Fig. 1;

Fig. 7 is a sectional view of the inking mechanism portion of the device;

Fig. 8 is a top plan view of the ink fountain and the transfer roll which is connected therewith;

Fig. 9 is a top plan view of one of the traversing rolls of the inking mechanism;

Fig. 10 is a side elevation of the type ring;

Fig. 11 is a face view of a fragmental portion of the type ring;

Fig. 12 is a section on line 12—12 of Fig. 11;

Fig. 13 is a sectional view through the work, the type ring, its guide roll and the back-up roll showing the relative position of the parts in somewhat enlarged relation;

Fig. 14 is a fragmental portion of the work showing printing thereon;

Fig. 15 is a sectional view of a modified form of type ring;

Fig. 16 is a detail sectional view showing the locking of certain parts together.

It is desirable that any printing upon wire particularly upon the insulated covering of wire be done immediately upon its formation, which is usually before the insulated covering is completely hard and set. This requires that the parts which contact and guide the wire be of such a character that they move with the wire and prevent any great amount of rubbing which might tear or rupture the surface of the wire. It also is desirable that there be a ready interchange of parts for varying the size of wire or for printing various inscriptions and characters upon the wire; and by the use of this apparatus which is described herein all of these advantageous results are accomplished and a machine is provided which is extremely simple in

its construction and operation; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawings, 15 designates an upstanding support frame provided with a base 16 for resting upon or attachment to some desired part on or adjacent to the wire covering machine. This base is provided with a cut out or recess 17 which is in a location for accommodating the passage of wire vertically upwardly therethrough. Standard 15 is somewhat triangular in shape although the exact shape of the structure is unimportant so long as it provides a bearing for the back-up or platen wheel 18 and a mounting for the remaining part of the structure.

A boss 19 on the standard 15 (see Fig. 5) serves to support a stub shaft 20 having a reduced portion 21 passing through an opening 22 in the boss and standard 15 and secured by means of the threaded end 23 and nut 24. The back-up wheel 18 has a hub 25 rotatably mounted upon the stub shaft 20 which is held against moving axially of the shaft by the washer 26 secured as by screw 27 to the end of the shaft to prevent axial sliding of the wheel from the shaft. This wheel is recessed on its surface and an annular rubber band 14 is set in this recess to provide an engaging surface and cushion support. A cam 28 is secured to the hub to rotate therewith and is positioned between the end of the hub and the boss 19.

A lever 31 is pivoted upon the standard 15 by means of a pin 33 extending into boss 32, the lever 31 being rockably mounted on this pin and held from axial sliding on the pin by washer 34 and headed screw 35 threaded into the end of the pin 33. This lever 31 has an arm 36 engaging the cam 28 so that as the back-up wheel rotates the cam will move the lever about its pivot to oscillate its arm portion 37 upwardly and downwardly.

The upper end of the standard 15 is thickened (see Fig. 16) and a pin 29 extends therefrom providing a support for rockably mounting the frame 30. The frame 30 is of a somewhat irregular outline being of skeleton formation to provide bearings for various parts in certain definite locations, while the remaining parts of the structure are cut away for lightness. The outline of this frame may be traced by the numeral 38 applied at various points on the drawing. This frame is offset at 39 so that its main portion is in a plane out of line with its pivotal portion or boss 40 which has an opening to receive the pin 29 and has a finger 41 to extend upon the opposite side of the standard to hold it from sliding axially of the pin 29. However, when this frame is swung vertically upwardly through forty-five or more degrees or an amount sufficient so as to clear the lever 31, the finger 41 is raised clear of the standard 15 permitting the frame to be freely slid from its pivot. Thus in sliding from its pivot there will be no danger of bending the lever arm 31. As illustrated in Fig. 3, this frame has a bifurcated portion at its lower end 42 comprising a bracket 43 with a portion 44 in spaced relation to the frame 42 so as to receive the lower portion 45 of the standard 15 to steady this bracket and guide it in its movement about its pivot. This bracket also serves as a point of engagement for the arm 46 pivoted as at 47 to the standard 15, see Figs. 1 and 2, so that when this frame is lifted, such for instance as for changing the type wheels, this arm 46 may be swung into the position shown in Fig. 2 to engage the end of the bracket and hold the frame in this supported position for interchange of parts.

The frame 30 may be limited in its downward movement about its pivot 29 by reason of the member 102 threaded through a suitable bearing in the bracket to contact with the portion 45 of the standard, there being provided a knurled head 103 and a lock nut 104 to bind the part 102 in position.

This frame 30 is provided with a boss 48 (see Fig. 3) which supports shaft 49 by means of its reduced portion 50 extending through the boss and being secured by its threaded end 51 and nut 52, while on this stud shaft 49 there is rotatably mounted a wheel 53 having a rubber outer surface 54 which is held in position by a large headed screw 55 secured on the end of the stub shaft 49. This wheel is freely rotatable upon the stub shaft.

Frame 30 also is provided with a boss 56 (see Fig. 4) which supports the shaft 57 by means of its reduced portion 58 extending through the boss 56 and having a threaded end 59 secured in position by nut 60. A knurled wheel 61 is provided with an elongated hub 62 which is rotatably supported on this stub shaft 57 and is recessed to receive the enlarged head 63 of the pin 57 to hold this wheel against axial sliding from the pin 57 while being freely rotatable thereon. This hub has a guide wheel 64 slidably mounted upon it which also has a corresponding hub 65 which is keyed to it by means of a cotter pin 66 passing through registering holes in the hub 65 and hub 62 to serve to lock the parts against relative rotating movement and also to lock them against axial movement. This wheel 64 is recessed as at 67 in a width and depth dependent upon the type ring which is to be utilized and size of wire which is to be worked upon in the machine, various different wheels being supplied for different sizes of rings and work.

There is also provided on the frame 30 a boss 70 (see Fig. 3) which serves to mount the stub shaft 71 by reason of its being reduced in diameter to provide a portion 72 extending through the opening in the boss and threaded as at 73 to receive the nut 74. This stub shaft 71 rotatably supports the wheel 75 provided with a knurled surface 76 and having an elongated hub 77 recessed as at 78 to receive the headed screw 79 which has threaded engagement as at 80 into the pin 71 to hold the wheel 75 from axial movement from the pin or stub shaft 71 while freely rotatably mounting it thereon. A wheel 81 is mounted upon the hub 77 and is secured thereto by the cotter pin 82 extending through registering openings in the hub 83 of this wheel and the hub 77 of the wheel 75. This wheel 81 provides a recess 84 for receiving and guiding the type ring which bottoms upon this recess and is guided by its side walls, various wheels with different grooves being supplied for different sizes of rings to be mounted in the machine.

A pin 87 extends from the lower portion of the frame 30 to rockably mount an arm 88 (see Fig. 1) having a suitable boss 88' with an opening to receive this pin, while it rotatably supports at its outer free end a wheel 89 having a narrow flange 90 and a wide flange 91, this wheel being secured against axial movement by the headed screw 92 extending into the rotary support at the end of

the arm 88. Various other wheels 89 may be supplied having the flanges 90 and 91 different distances apart to accommodate various width rings. The arm 88 is limited in its swinging movement by means of a pin 93 which will engage the frame 30 at a position to prevent the wheel 89 from contacting any support or part below the plane upon which the device may be mounted so as to prevent injury thereof.

The type ring 95 is shown in detail in Fig. 10 and consists of an annular member of some desired cross-section, such as T-shaped, as shown in Fig. 12, although a rectangular section is suitable. This shown section provides a narrow stiffening part 96 with a head 97 extending from either side of the part 96, while the type 98 is formed integral with the ring and raised upon its surface. This ring is suitable for printing wire up to a diameter of less than one-half of an inch. However, when larger wire is utilized I will provide a ring such as shown in Fig. 15 having a tapered groove or recess 99 for receiving the tapered ring 100 of rubber which extends about the ring, or I may utilize other varying means of providing a printing roll for contact with the work.

The ring printing member which is illustrated in Fig. 10 is shown in the other figures of the drawings as mounted so as to fit within the groove 67 of the wheel 64 (see Fig. 4) and the groove 84 of the wheel 81 and to fit between the narrow flange 90 and the wide flange 91 of the wheel 89 (see Fig. 3), this ring being easily insertable upon these three points of support by merely lifting the arm 88 and positioning the ring into these two grooves, and then allowing the arm 88 to lower into position so that its roll 89 engages the ring to guide it in its movement in the other grooved rolls. The portion 96 of this ring bottoms upon the groove 84 with its head or wider portion just touching or extending into the edge of the groove to prevent axial movement while the portion 96 extends into and bottoms upon the groove 67 of the wheel 64 with its head also guided between its side walls. In this wheel the depth of the groove is sufficiently great so as to also receive and guide the wire or work which I designate 101 (see Fig. 13), as will be described in greater detail hereinafter, and as the work varies in size the grooved rolls will be changed for accommodation of the different sizes of work.

The inking mechanism consists of a separate completely detachable unit mounted upon the frame 30. A pivot pin 105 is fixed upon the frame 30 extending laterally therefrom while a frame 106 is provided with a boss 107 and an opening 108 to receive this pin 105 and be rockably supported thereon. This frame is positioned on the pin 105 when in a raised position and is locked upon this pin 105 by means of a hook 109 into which it is lowered when in working position. The limit of its lowered position may be adjusted by means of the screw 110 threaded into the boss 111 and manipulated by the handle 112 and held in adjusted position by the set screw 113, the end 114 of this screw engaging the extension 115 of the frame 30 to limit its downward position relative thereto and to support it in such adjusted position.

A boss 116 serves to support a stub shaft 117 by means of a reduced portion 118 threaded into a suitable opening 119 in this boss. Upon this stub shaft 117 a rubber roll 120 is rotatably mounted by its hub 121 being locked by cotter pin 123 to the hub 122 having a recess 124 to receive the washer 125 and headed screw 126 threaded into the shaft 117. This wheel 120 has portions 127 and 128 to engage the knurled surfaces 76 of the wheel 75 and 129 of the wheel 81 for causing rotation thereof, while it has a surface 130 of lesser diameter for engaging the type wheel and transferring ink thereto. A lever 131 is pivotally mounted on the boss 116 and carries a pawl 132 pivoted as at 133 for engagement with the ratchet wheel to be described.

An ink fountain 135 consists of a trough 136 in which ink 137 is contained. The forward end of the trough provides bearings 143 and 144 to rotatably mount a pin 145 having a roll 146 fixed thereon and extending through a slot 147 in the end wall 148 of the trough so as to engage the ink. This shaft 145 has a ratchet wheel 149 fixed thereon and the shaft extends through the frame 106 and serves to rockably mount the trough pivotally in position about this shaft. A pin 138 extends from its side wall 139 of the trough into a notch 140 in the frame 106 to be secured in position by the knurled nut 141 engaging the threaded end 142 of this pin 141, to hold the trough in adjusted position. The pawl 132 extends to engage this ratchet wheel so as to propel the same in response to the oscillation of the lever 37 and 131. I have provided a cap 150 which may be secured in adjusted position by an arm 151 which cap covers a portion of the teeth of the ratchet wheel 149 so as to control the number of the teeth engaged by the pawl and govern the amount of rotative movement of the ratchet wheel and provide an easy adjustment therefor. An auxiliary rotating member 152 is supported on a shaft 153 mounted in bearings 154 in the trough to assist in distributing and feeding ink to the wheel 146. A guard 155 is built up from the edge of the trough to prevent ink from getting into the ratchet wheel but the pawl 132 is of a rather heavy construction with a sharp knife edge type of dog 156 which will serve in a large measure to cut through any ink which may accidentally accumulate on the ratchet wheel and will tend to discharge it therefrom.

A plurality of rolls are utilized for transferring and distributing the ink from this pick-up roll 146 to the roll 120. A frame 160 is hung upon a pivot 161 extending from the frame 106 and consists of a pair of spaced plates with a rubber roll 162 mounted in slots 163 by means of a pin 164 and spacing collars 165 while a metal roll 166 is fixedly mounted upon a pin 167 extending through the plates 160 to support it in position. This frame is slid upon the pin 161 when in raised position and held against axial movement on the pin by reason of locking with a hook 168 fixed on the frame 106, when the plates 160 are in lowered or operating position. I also provide a roll 170 mounted in the frame 171, which frame has a pair of spaced plates 172 and an integral bearing 173 having an opening 174 to receive a pin 175 which is fixed upon and extends from the frame 106. This frame locks in position on the frame 106 when in lowered position by reason of the hook 176 on the frame so that the roll 170 is in contact with the intermediate portion 130 of the roll 120. Cams 177 and 178 (see Fig. 9) are located on either side of the roll 170 and are secured to the pin 179 upon which this roll is mounted, so that as the roll rotates it moves axially back and forth by the pin sliding in the bearings 180 in the plates or arms 172, these cams engaging projections 181 on the arms 172. When the rolls 166, 162 and 170 are all in lowered work-

ing position the rubber roll 162 is somewhat compressed so that good contact is had between the rolls of the series and any ink which is picked up by the roll 146 is transferred to the roll 166 thence to the roll 162, thence to the roll 170, and thence to the roll 120 where it is applied to the printing type 98 on the printing ring. The roll 146 is driven from the pawl and ratchet, as above explained. A cover and guard 181 has a leaf 182 to extend over and close the ink reservoir and an arcuate portion 183 to protect the moving parts. This arcuate portion 183 is slotted to receive the frame 30 so that the end of the arcuate portion rests in a recess 184 in the frame 106 to serve as a pivotal point of support while the leaf of the guard rests on the trough 135 as another point of support. The guard may be easily lifted by its leaf portion 182 pivoting about the notch 184 for adding more ink to the trough.

The entire weight of the frame 30 and ink fountain tend to swing the frame 30 with the printing ring toward the back-up roll 18 and the work 101 which is usually drawn upwardly contacting the rubber surface 14 of the back-up roll and guided between the flanges of the roll 64 in the recess 67 of the roll which supports the printing ring as it is moved upwardly through the machine. This weight may be supplemented by the weight 185 if desired. The wire transfers its motion to the printing ring and the wheel 64 which in turn drives roll 61, which by reason of its knurled surface engaging the rubber 54 of the roll 53, transfers its motion to the knurled surface 76 of the roll 75 and this knurled surface together with the knurled surface 129 which rotates with it transfers its motion to the rubber roll 120 so that this roll 120 is driven independently of its surface 130 which contacts with the type. This roll 120 in turn drives the oscillating roll 170 and the train of rolls 162, 166 and 146 serving to assist in driving are driven together one from the other, the latter from a different source as by the positively driven ratchet wheel. The amount of pressure on the rubber roll 120 with its knurled surfaces 76 and 129 may be varied by the adjusting screw 110 while the amount of pressure on the wire may be varied by the adjusting screw 102.

If it is desired to change type rings such as 95 it is merely necessary to raise the frame, as shown in Fig. 2, and insert the arm 46 to hold it in raised position and then by lifting and holding the frame 106 and also lifting the arm 88 the ring may be removed from position and a new ring inserted with different type thereon. If, however, a different diameter wire is to be handled the grooved roll 64 and roll 81 will be changed so that the depth of the groove 67 in roll 64 and depth of groove in roll 81 may accommodate the size wire desired, and in this case a different type ring will also be provided having a different head portion 97 to fit these wider grooves in these rolls if the wire be wider.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a printing machine, a hoop-shaped printing ring, and a plurality of grooved rolls positioned for receiving the inner surface of said ring in said groove and rotatably supporting said ring in position in said machine, and means having yielding engagement with said ring adapted to hold it in desired position, said means being movable out of contact with the ring for removal of the same.

2. In a printing machine, a hoop-shaped ring, and a plurality of grooved rolls for receiving said ring in said groove and rotatably supporting said ring in position in said machine, one of said rolls also receiving the work between the side walls of said groove and guiding it in its passage through the machine.

3. In a printing machine, a hoop-shaped ring, a pair of grooved rolls for receiving said ring in said groove and rotatably supporting said ring in position in said machine, and a third roll at the end of a swinging arm to engage said ring and by the weight of the roll and arm assist in holding the ring in desired position, said arm being swingable to remove the roll from contact with the ring for removal of the same.

4. In a printing machine, a back-up or platen wheel, a centerless printing ring positioned in close proximity to said wheel to print work passing between said wheel and ring, said ring being supported on its inner surface by a plurality of rotating supports, one of which being movable to a position out of contact with the ring for removal of the same.

5. In a printing machine, a printing ring, a back-up or platen wheel of substantially the same size as said ring, and means for guiding work in passing between the wheel and ring, said means also serving as a support for said ring.

6. In a printing machine, a standard, a platen wheel rotatably mounted on said standard, a frame swingably mounted on said standard, a type ring rotatably mounted on said frame and movable toward and from said wheel by the swinging of said frame relative to said support, and interlocking means between said frame and standard to hold the parts against relative movement axially of the swinging mounting between them when in working position, said interlocking means being free of such holding when the frame is in raised position.

7. In a printing machine, a framework, a platen wheel and a type ring thereon, an inking unit for said type ring comprising a frame swingably mounted on said framework and movable toward and from said type ring by swinging of the frame relative to its support, and interlocking means between said framework and unit to hold the parts against relative movement axially of the swinging mounting between them when in working position, said interlocking means being free of such holding when the frame is in raised position.

8. In a printing machine, a platen wheel, a rotatably mounted printing ring, means for applying ink on said printing ring comprising a plurality of rotatable parts, means deriving its power through the ring for rotating some elements of said inking mechanism, and means deriving its power through the platen wheel for rotating other elements of said inking mechanism, said platen wheel and type ring being arranged to derive movement entirely through the engagement of the work therewith moving through the machine.

9. In a printing machine, a framework, a platen wheel and a type ring thereon, an inking unit for said type ring carried on a frame swingably mounted on said framework and movable toward and from said type ring by swinging of the frame relative to its support, and inter-

locking means between said frame and framework arranged to hold the parts against relative movement axially of the swinging mounting between them when in working position and free of such holding when the frame is in raised position.

10. In a printing machine, a platen roll, a printing ring directly driven by the work, a plurality of rolls supporting said ring adjacent its periphery and rotated by the ring, inking mechanism for the printing ring comprising a plurality of rolls arranged to form a train for conveying ink to the ring, one of the ring-supporting rolls furnishing a drive for the ink mechanism at one end of the train.

11. In a printing machine, a platen roll, a printing ring directly driven by the work, a plurality of rolls supporting said ring adjacent its periphery and rotated by the ring, inking mechanism for the printing ring comprising a plurality of rolls arranged to form a train for conveying ink to the ring, one of the ring-supporting rolls furnishing a drive for the link mechanism at one end of the train, and separate and independent means including a cam associated with the platen roll for driving the train of rolls at the other end of the train.

12. In a printing machine, a platen roll, a printing ring directly driven by the work, a plurality of rolls supporting said ring adjacent its periphery and rotated by the ring, inking mechanism for the printing ring comprising a plurality of rolls arranged to form a train for conveying ink to the ring, one of the ring-supporting rolls furnishing a drive for the ink mechanism at one end of the train, and separate and independent means including a ratchet and pawl mechanism associated with the platen roll for driving the train of rolls at the other end of the train.

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