

April 26, 1927.

1,626,401

C. T. FRANTZ

PRINTING MACHINE

Filed June 26, 1925

2 Sheets-Sheet 1

Fig. 1.

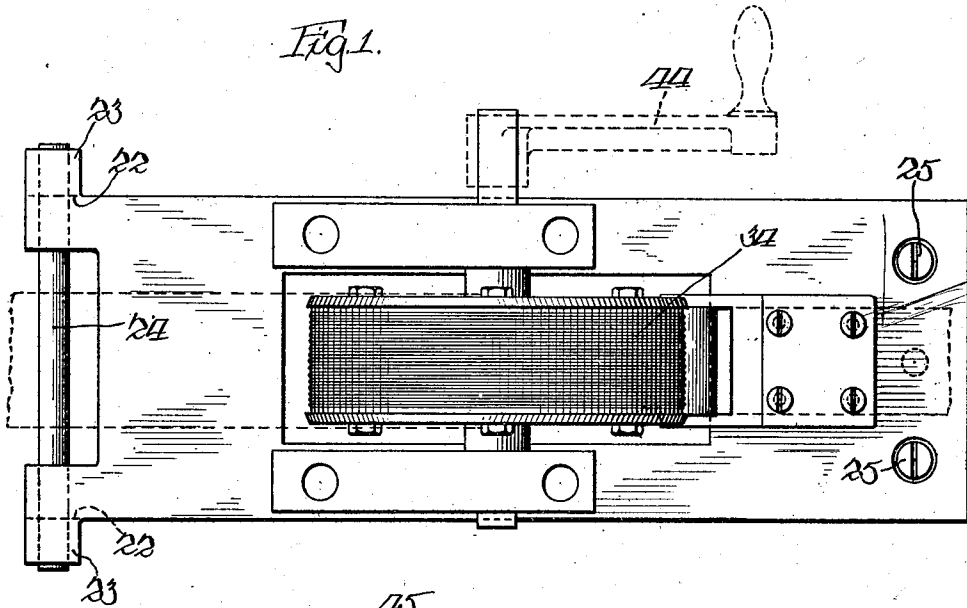
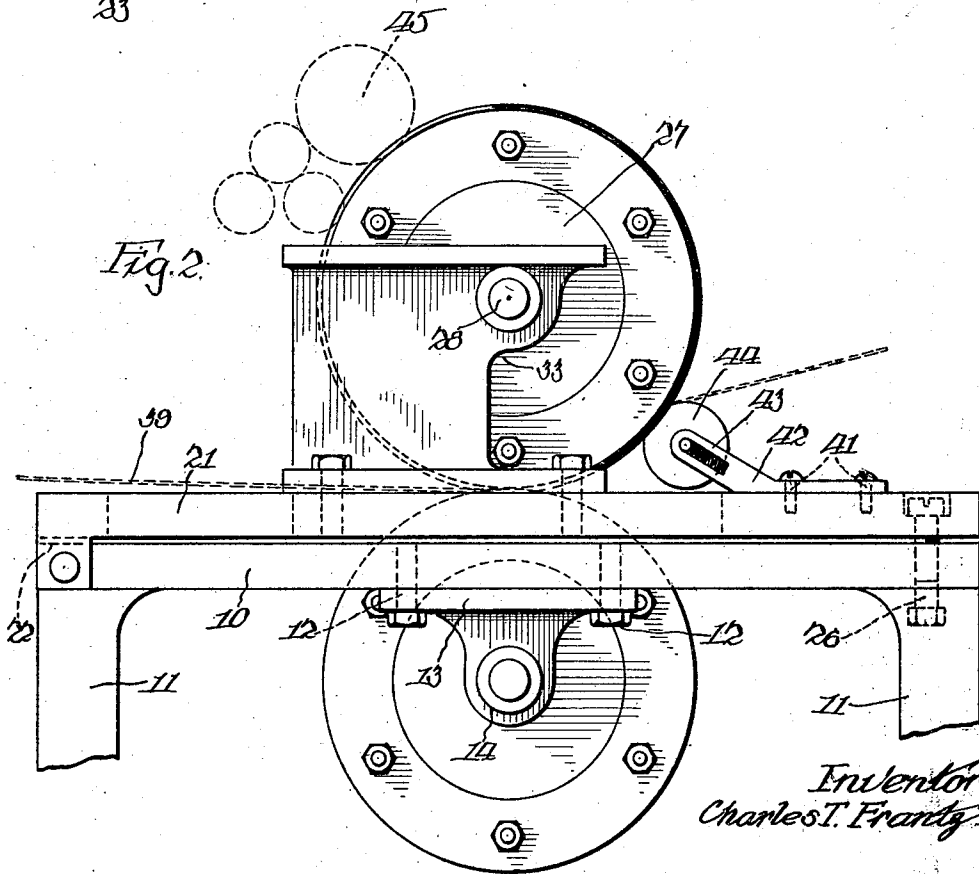


Fig. 2.



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2 Sheets-Sheet 2

Fig. 3.

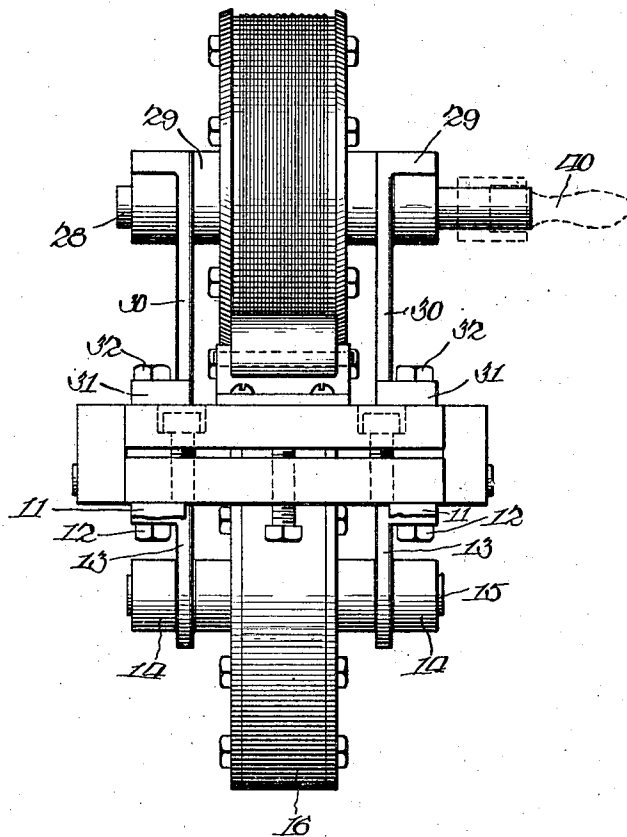
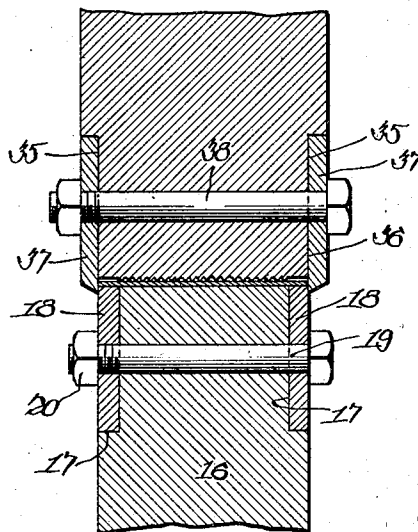


Fig. 4.



Inventor:
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George J. Haight, Atty.

UNITED STATES PATENT OFFICE.

CHARLES T. FRANTZ, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO RECORDING THERMOMETER COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF WASHINGTON.

PRINTING MACHINE.

Application filed June 26, 1925. Serial No. 39,672.

This invention relates to printing machines.

In the use of certain types of recording mechanisms, such as that shown in my pending application, Serial No. 15,745, filed March 16, 1925, there are employed certain record sheets in the form of traveling tapes or strips of material provided with certain indicia, including a plurality of parallel lines, which in conjunction with the thermostatically controlling stylus, produce a desired record, and due to the nature of the mechanism during its operation, it is positively essential that the edges of the traveling tape or sheet, which is mounted in suitable guide means, be exactly parallel to the lines on the sheet; since if there is any variation in this respect, the record produced would be inaccurate and hence absolutely useless.

An object of the invention, therefore, is to provide a machine for the purpose of printing a tape or chart with certain indicia including parallel lines such as those above referred to, in such a manner as to positively insure that the edges of the tape or chart will be exactly parallel with the indicia upon the sheet, so that the recording sheet when used in connection with an apparatus of the character above referred to, will produce an absolutely accurate record.

More specifically the invention relates to a printing machine, including printing and cutting means, the cutting means being arranged to cut the sheet and hold the same following the cutting operation, in conjunction with printing means which are arranged in fixed relation with respect to the cutting means and adapted to print the sheet while the same is held by said cutting means, thereby positively insuring that the edges of the sheet will be spaced the exact distance desired at all points from the indicia impressed thereon by the printing means.

Other and further objects of the invention will more fully and clearly appear from the description and claims hereinafter following.

In the drawings Figure 1 illustrates a top

plan view of the invention; Figure 2 is a side elevational view of the invention; Figure 3 is an end elevational view of the invention; and Figure 4 is an enlarged transverse sectional view through the printing and cutting means.

Referring more particularly to the drawings, 10 denotes a preferably elongated table or support upon which the mechanism is carried, said table being provided with suitable supports 11 for carrying the table in somewhat elevated position. Preferably fixedly mounted upon the undersurface of said table 10, by means of screw bolts 12 are spaced angular brackets 13—13, one angular portion of each bracket projecting downwardly from the undersurface of the table, and being provided with a hub 14, adapted for the rotatable reception of an end of a shaft, 15 upon which, between the inner ends of the hubs 14, is fixedly mounted a roll 16, said roll being held against lateral play on the shaft by abutment with the hubs 14 on either side thereof, the roll 16 projecting upwardly through a suitable opening in the table 10, to a point somewhat above the upper surface of the table. The roll 16 is preferably of bronze, or other suitable material, and at its side edges is provided with circumferential rabbets 17—17, as best shown in Figure 4, said rabbets being provided for the reception of flat rings 18—18 preferably made of tool steel, said rings being detachably mounted in the rabbets 17—17 by means of bolts 19 which extend through the roll, each of the bolts having a nut 20 threaded upon its end in the usual manner.

Pivotaly mounted upon the table 10 is a superposed swingable support 21, said support being arranged to swing with reference to the table 10 by the provision of a hinged connection at one end thereof, with the adjacent end of the table 10, said table 10 having a cut out portion providing extensions 22, and the support 21 having ears 23—23 which are adapted to be disposed at the outer sides of the extensions 22—22 of the table 10, a pivot pin 24 extending

through the extensions and ears so as to pivotally connect the same together, so that the support may be pivotally swung with respect to the table 10. To permit the swinging movement with reference to the roll 16, the support 21 is provided with an opening for the reception of the upper portion of the roll 16, and to provide means for varying the clearance between the table 10, and the support 21, a plurality of adjusting screws 25—25, and 26 are arranged at the end of the table and support opposite the hinged connection. The screw 26 is threaded centrally through the end of the table, the inner end of said screw bearing upon the undersurface of the support 21, and the screws 25—25, are located adjacent the edges of, and extend through the support 21, and are threaded into the table 10. By this arrangement the clearance between support 21 and the table 10 can be nicely adjusted, and the members held fixed in adjusted position.

The support 21 is arranged to carry a roll 27 in position to co-operate with the roll 16, as hereinafter more particularly pointed out, the roll 27 being fixedly mounted upon a shaft 28, the ends of said shaft being rotatably supported in the hubs 29—29, formed upon the upper ends of transversely spaced standards 30—30, each of said standards being provided at its lower end with an angular portion 31 through which is extended screw bolts 32, the standards 30 being preferably cut out at their forward portions, as indicated at 33 to expose the forward portion of the roll 27. The diameter of the roll 27 is the same as that of the roll 16, and the standards 30—30 are so arranged that the lowermost periphery of the roll 27 will substantially coincide with the upper surface of the support 21, and be rotated closely adjacent the uppermost periphery of the roll 16, the clearance between the rolls 16 and 27 being regulated by the adjusting screws 25 and 26. The roll 27 is also preferably of bronze, and the periphery or tread of the same is provided with a suitable form, in this instance a plurality of integral circular ribs 34, which are arranged exactly parallel with the side edges of the roll 27. The roll 27 is slightly wider than the roll 16, and is provided with circumferential rabbets 35—35 of such a depth that the width of the rabbeted portion 36 is exactly the same as the width of the roll 16 including the rings 18, as best shown in Figure 4, and secured in the rabbets 35—35, are flat rings 37—37 of tool steel, said rings being detachably secured in the rabbets by a series of bolts 38 extending through the roll 27. The rings 37—37 are of such width as to project in the manner of flanges beyond the periphery or tread of the roll 27, so as to embrace therebetween the roll 16, the extending portions of the rings 37 in conjunction with the body of the roll 27 providing a guide or trough into which the roll 16 projects, the parts being proportioned so that the roll 16 including the rings 18 exactly fits between the extended portions of the rings 37—37, said latter rings bearing upon the outer surfaces of the rings 18—18, and in this manner providing cutting means for a sheet of material indicated at 39 when the rolls 16 and 27 are rotated with respect to each other. Rotation of the rolls may be effected by means of a crank 40 fixed to one end of the shaft 28, or such shaft may be rotated by a suitable belt and pulley arrangement in a well known manner if desired.

Mounted upon the support 21, adjacent the roll 27, by means of suitable screw bolts 41 is a forked bracket 42, between the forked ends 43 of which is rotatably mounted a roller 44, the roller being so arranged as to have its bearing surface resiliently pressed into engagement with the periphery or tread of the roll 27, and the roller 44 being of such a width as to fit within the flanges or extensions provided by the rings 37—37 upon the roll 27, said roller 44 being adapted to press the sheet 39 against the form 34 of the roll 27, as the sheet travels through the apparatus. Suitable means indicated diagrammatically at 45 is provided for inking the roll 27 to cause the sheet to be printed when pressed into engagement with the ribs 34 by the roller 44.

In operation the sheet of material which may be of any suitable character, and of a width greater than the final desired width of the sheet, is fed from a supply roller not shown, between the rolls 16 and 27, as the same are rotated through manipulation of the crank 40, or in any other suitable manner. As the sheet 39 passes between the rolls, the same is cut by the shearing action of the extensions or flanges provided by the rings 37—37 acting in conjunction with the rings 18—18, so as to fit exactly within the guide or trough provided by said extensions or flanges in conjunction with the body portion of the roll 27, continued travel of the rolls and sheet causing the sheet to travel between the roller 44 and the roll 27, while the sheet is still fitted exactly within the guide or trough referred to, and due to the fact that the roller 44 presses the sheet tightly against the form or ribs 34, the sheet is printed while held in the guide, and this action continues until a desired quantity of the sheet material is cut and printed, thereby cutting the opposite edges of the sheet material exactly parallel to each other, and holding the sheet while the printing means, which are parallel to the cutting means,

print the sheet exactly parallel with the edges thereof, insuring the production of a sheet or strip of material in which the lines thereof are exactly parallel to each other, and are parallel to the edges of the sheet.

While I have herein shown and described what I now consider the preferred manner of carrying out my invention, the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In an apparatus for cutting and printing a sheet of material, printing means for operating upon said sheet; cutting means operating upon the portion of said sheet within opposed marginal edges to sever said marginal edges therefrom and define the sheet and means for coordinating said printing and cutting means to cause the same to operate synchronously in unvarying predetermined relation with respect to each other and to said sheet during operation thereupon.

2. In an apparatus for cutting and printing a sheet of material; of means for cutting said sheet, said cutting means being arranged to hold the opposite edges of said sheet against movement when cut; and printing means arranged in predetermined fixed relation with respect to said cutting means and adapted to print said sheet while held by said cutting means.

3. In an apparatus of the character described; of guide means for a sheet of material; means operating to cut said sheet of material to a size to fit within said guide means and hold the same within said guide means; and means operating in predetermined relation with reference to said guide means for printing said sheet while held in said guide means.

4. In an apparatus for cutting and printing a sheet of material, including relatively movable members between which said sheet travels, one of said members being provided with a trough, and the other of said members being arranged to fit within said trough to provide cutting means; and printing means associated with one of said members and arranged to print said sheet of material while disposed in said trough.

5. In an apparatus for printing a sheet; of guide means for said sheet, said guide means comprising co-operating elements by which said sheet is cut and forced into said guide means; and means for printing said sheet while held in said guide means.

6. In an apparatus of the character described, a movable member having a form arranged parallel with the edges thereof; cutting means spaced from and arranged parallel with said form, said cutting means being arranged to cut said sheet and hold the same in the position in which the sheet is cut; and means associated with said movable

member in predetermined relation and adapted to co-operate therewith to print said sheet.

7. In an apparatus of the character described, the combination with a printing roll provided with a form parallel to its side edges; cutting means secured to said roll exactly parallel with said form; means co-operating with said cutting means to cut a sheet of material and press the same between said cutting means; and means associated with said printing roll for printing said sheet subsequent to cutting thereof.

8. In an apparatus of the character described, the combination with a printing roll having a form thereon, and provided with cutting blades secured to the side edges thereof in predetermined relation with reference to the form provided on said roll; of a second roll provided with cutting means adapted to co-operate with said first named cutting means, said second roll fitting between said first named cutting means; and means arranged in predetermined relation with reference to said printing roll for printing a sheet of material as the same is passed between said rolls.

9. In an apparatus of the character described, the combination with a table; of a roll rotatably mounted upon said table; a support pivotally mounted upon said table and carrying a printing roll provided with cutting means adapted for the reception of said first roll therebetween, movement of said support with reference to said table regulating clearance therebetween to provide for approach or recession of said rolls with reference to each other; means for operating said printing roll for printing a sheet of material as it is passed between said rolls; and means for adjustably varying the clearance between said table and said support.

10. In an apparatus of the character described, the combination with a printing roll having a form on its tread, and having its side faces provided with circumferential rabbets; rings of hardened metal detachably secured in said rabbets, said rings projecting beyond the tread of said roll; a second roll adapted to co-operate with said first roll, said second roll being provided at its opposite sides with circumferential rabbets; and rings of hardened material detachably secured in said rabbets, said latter roll being adapted to fit between the rings of said first roll to provide cutting means; and means co-operating with said printing roll and adapted to print a sheet of material when the same is fed between said rolls.

11. In an apparatus of the character described for operating upon a sheet of material; means for cutting said sheet along parallel lines to shape the sheet; means for printing said sheet between its marginal edges; and means for co-ordinating said

printing and cutting means to cause the same to operate synchronously in unvarying predetermined relationship with respect to each other and to said sheet during operation thereupon. thereof parallel; and means co-operating with said cutting means for printing a plurality of lines on said sheet parallel to each other and to the edges of said sheet. 50

12. An apparatus or the character described comprising means for cutting out a sheet of material with the opposite edges

In witness that I claim the foregoing I have hereunto subscribed my name this 13th day of June, 1925.

CHARLES T. FRANTZ.