March 19, 1929. S. LEMPEREUR ET AL 1,706,238

REPRODUCING APPARATUS

Filed Nov. 15, 1926 2 Sheets-Sheet 1

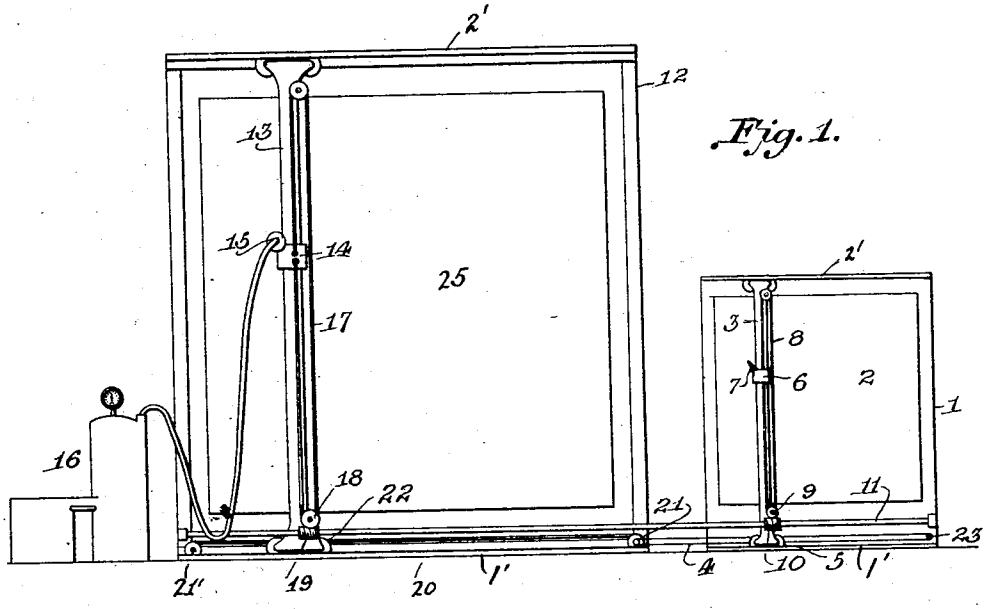


Fig. 1.

Fig. 6.

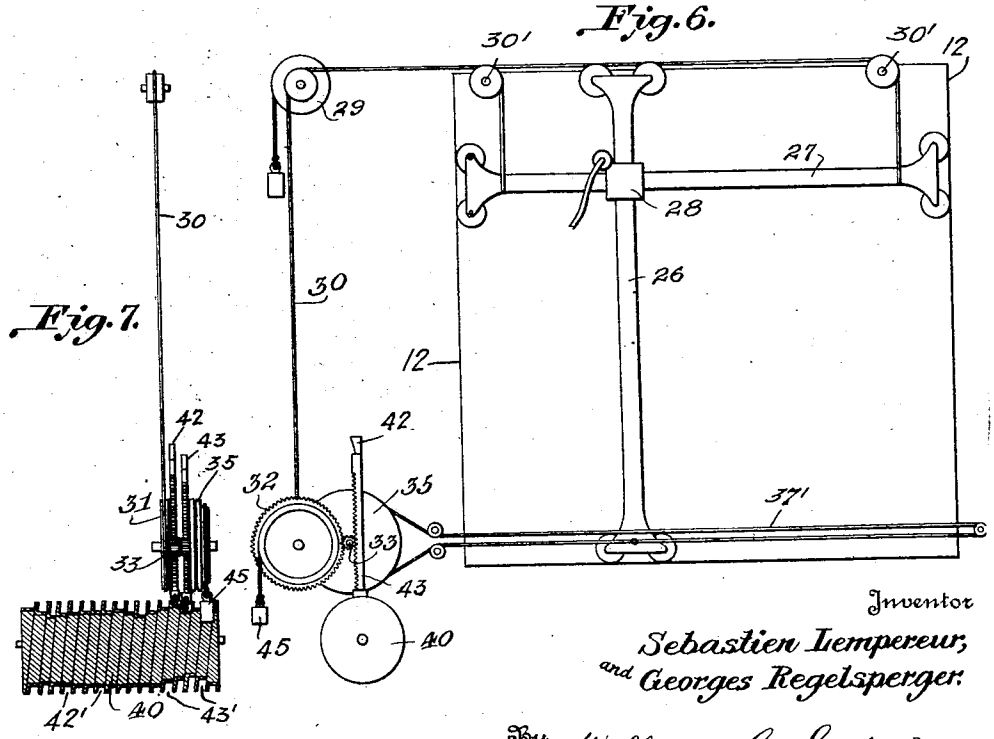


Fig. 7.

Inventor
Sebastien Lempereur,
and Georges Regelsperger.

By William C. Linton.
Attorney

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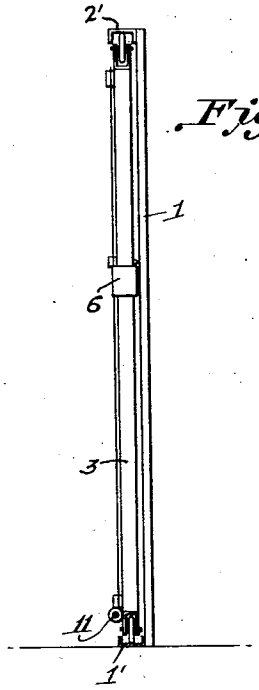


Fig. 2.

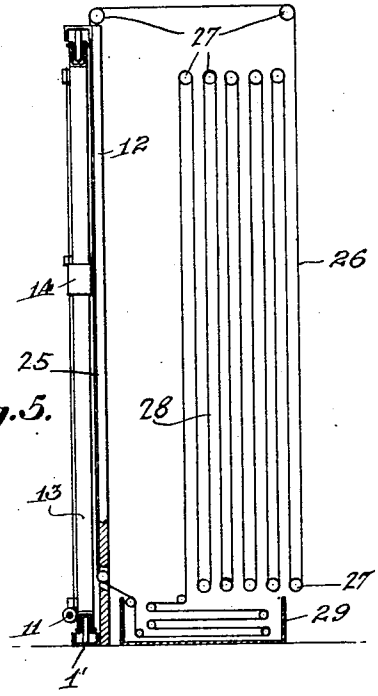


Fig. 5.

Fig. 8.

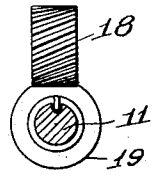


Fig. 4.

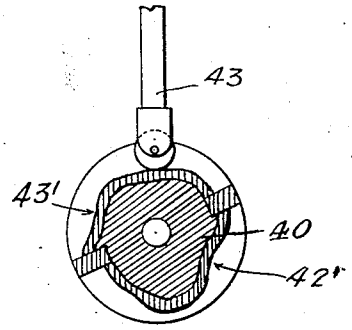
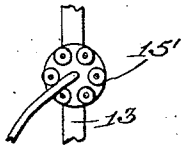


Fig. 3.



Inventor
Sebastien Lempereur
and Georges Regelsperger.

By William C. Linton.
Attorney

Patented Mar. 19, 1929. 1,706,238

UNITED STATES PATENT OFFICE.

SEBASTIEN LEMPEREUR, OF SEINE, AND GEORGES REGELSPERGER, OF OISE, FRANCE.

REPRODUCING APPARATUS.

Application filed November 15, 1926, Serial No. 147,171, and in France February 24, 1926.

This invention relates to a reproducing apparatus and more particularly to an apparatus whereby a design, print, pattern or similar article may be reproduced in any ratio and has for its primary object to accomplish this result in a very accurate manner with mechanism mechanically or manually operated.

An object of the invention is the provision of mechanism of such a design that the master device or controller can be located at any distance necessary from the reproducing device.

Another object of the invention is the novel arrangement of the various parts so as to simplify the apparatus without in any way affecting its accuracy of reproduction.

A feature of our invention is the novel construction of the control mechanism whereby the apparatus may be operated continuously mechanically or may be operated by hand.

With these and other objects in view the invention will be better understood from the attached drawings taken in consideration with the annexed specification, wherein

Figure 1 is a front elevation of the reproducing apparatus,

Figure 2 is an end elevation of the master design holding frame,

Figure 3 and Figure 4 are detail views,

Figure 5 is a vertical sectional view of the reproducing frame,

Figure 6 is a front elevation of the reproducing frame having mechanical means connected thereto for automatically controlling the air brush or the like, and

Figures 7 and 8 are detail views thereof.

Referring now more particularly to the drawings wherein like and corresponding parts are designated by similar reference characters through the several views, the numeral 1 indicates the master design frame which has mounted upon one face thereof a print or other pattern sheet 2 upon which is displayed the master design to be copied or enlarged upon the sheet or roll of paper 25 of the reproducing frame 12. These frames are connected by a lower channel bar or track 1′ and a track 2′ is secured to the upper end of each frame in which travel the rollers of the carriages 3 and 13 so that the latter may travel across the frames. The carriage 3 has connected thereto a cable or sprocket chain 4 which travels over the rollers 21 and 23 and a suitable handle (not shown) may be connected to the roller 23 whereby this carriage may be manually caused to move across the master design carried by the frame 1. Slidably mounted on this carriage is a follower 6 carrying the tracer 7. This follower is moved along the carriage by the chain or cable 8 operated by the worm wheel 9 that engages the worm 10 on the shaft 11. The worm 10 is connected to the shaft to slide therealong but held in its engagement with the worm wheel 9 so as to actuate the same irrespective of the position of the carriage 3 and tracer 7.

As the tracer 7 is moved over the design, print or similar article, the movement thereof is simultaneously transmitted to the proper apparatus to bring about a reproduction upon the sheet 25 positioned upon the frame 12. The carriage 13 of this frame 12 has a support or slide 14 slidably mounted thereon to which is connected the opposite ends of a cable 17 which passes over the roller 18 carried by the carriage 13. The shaft 11 has also keyed thereto, but slidably thereon a worm gear 19 which is operatively connected to the lower roller 18 whereby with rotation of the shaft 11 by moving the tracer 7 the support 14 will also be caused to move in a vertical direction over the sheet 25 due to the cable connection 17. The support 14 carries an air brush 15 of the spraying apparatus 16. The air brush may consist of a plurality of nozzles 15′ as is illustrated in Fig. 3 whereby the designs, decorations, placards and the like may be reproduced in various colors. Thus it will be seen that these connections are such that accurate reproduction is assured. The carriage 13 is moved in a horizontal direction by the sprocket chain 20 connected thereto and which extends over the sprocket wheels 21 and 21′. One of the sprocket wheels 21 is connected to the heretofore mentioned chain 4 which is manually operated by the handle. Upon operation of this crank handle and sprocket 23 connected thereto the chains 4 and 20 will be operated for moving the carriages 3 and 13 horizontally and in unison. The relative speed of the carriages is determined by the relative size of the sprocket wheels. A crank handle may be attached to the shaft 11 to turn the shaft and thereby the slide 14 and tracer 7 through the worm wheel, sprocket and chain connection previously

described. As far as we have proceeded it will be seen that through the manipulation of the handles the tracer can be accurately moved over the design, and because of the positive mechanical connections the nozzle 15 moves in any ratio necessary.

In Figure 5 we have shown in a diagrammatic manner, an arrangement whereby a continuous strip of paper may be passed to view, and a design produced thereon and subsequently removed. The strip 26 is passed over suitably placed rollers 27′ to provide a vertical set of drying folds 28 and a horizontal set of folds that are positioned in a pan 29 so as to be subject to a cleaning solution. A section 25 of the strip passes over the heretofore described reproducing device so as to be worked upon by the nozzle 15.

The remaining figures illustrate a possible way of mechanically operating the reproducer. Herein, duplex carriages 26 and 27 are mounted for relative horizontal and vertical movements upon the frame 12 and connected by a suitable air brush support 28.

Suitably attached to carriage 26 is an endless cable or chain 37 mounted to extend longitudinally across the frame 12 and passing over a drum 35 which upon rotation, will cause carriage 26 to move horizontally. Likewise, fastened to carriage 27 is a cable or chain 30 riding on pulleys 30′ carried by the upper edge of the frame 12. The free portion of the cable 30 is adapted to wind on a drum 31 freely mounted on the same shaft supporting the first mentioned drum 35, and causing the carriage 27 secured to brush support 28 to move vertically on frame 12 which movement may be rendered smooth and uniform by counterbalancing the carriage 27 as shown at 29.

Rigidly secured to the drums 31 and 35 are pinions 33 each meshing with independent racks 42 and 43 respectively. The movement of these racks cause the different drums to rotate, transmitting, as stated before, a horizontal movement to carriage 26 and a vertical movement to carriage 27.

With a view towards affording a mechanical actuation of racks 42 and 43 we provide a rotatable shiftable controller 40, having on its peripheral surface two distinct and independent sets of spiral grooves designated by numerals 42′ and 43′ respectively, and whose surfaces are formed of a series of elevations and depressions registering the design or script to be reproduced, as more clearly shown in Figure 8.

The controller 40 is positioned so that the set of spiral grooves 42′ will receive the lower end of rack 42, while the set of grooves 43′ will receive the lower end of rack 43. A counterweight 45 is arranged as shown at 32 to properly hold the racks in close engagement with the irregular surfaces of the double spiral grooves assuring an accurate reproduction.

In the rotation of the controller the racks will move up and down to give movement to the drums 31 and drum 35. The drum 31 will act on cable 30 to raise and lower carriage 27 while drum 35 will act to operate the chain 37′ which in turn will move carriage 26. Thus, it will be seen that the entire surface of the sheet of paper may be acted upon.

It is of course to be understood that there are many other forms of our invention and the various parts may be constructed in various other ways and connected in other combinations and therefore we do not desire to be limited in any way except as set forth in the following claims.

We claim:

1. A reproducing device comprising a frame, a carriage movable over said frame parallel to itself, an air brush support movable with said carriage over said frame and slidably mounted upon said carriage in a direction normal to the direction of movement of said carriage, a master design controller, said controller comprising a grooved cylinder and means for operatively connecting said cylinder to said carriage and air brush support whereby rotation of said controls actuate said frame and support to follow a path determined by the configuration of the grooves of said cylinder.

2. A reproducing apparatus comprising a frame, a carriage movable over said frame parallel to itself, an air brush support slidably mounted upon said carriage in a direction normal to the direction of movement of said carriage, a master design controller, said controller comprising a rotatable and shiftable cylinder having grooves therein, rack bars adapted to travel within said grooves, drums operatively connected to said rack bars, cables connected to said carriage and support respectively and said cable being adapted to travel over said drums.

3. A reproducing apparatus comprising a frame, a carriage movable over said frame parallel to itself, an air brush support slidably mounted upon said carriage in a direction normal to the direction of movement of said carriage, a rotatable shiftable controller having two distinct and independent sets of grooves therein, a rack bar received within each set of grooves in said controller, drums operatively connected to said rack bars, and cables traveling over said drums and connected to said carriage and support respectively.

In witness whereof we have hereunto set our hands.

SEBASTIEN LEMPEREUR.
GEORGES REGELSPERGER.