May 28, 1935. A. B. KRUCZEK 2,002,698

PRINTING DEVICE

Filed Jan. 18, 1930 3 Sheets-Sheet 1

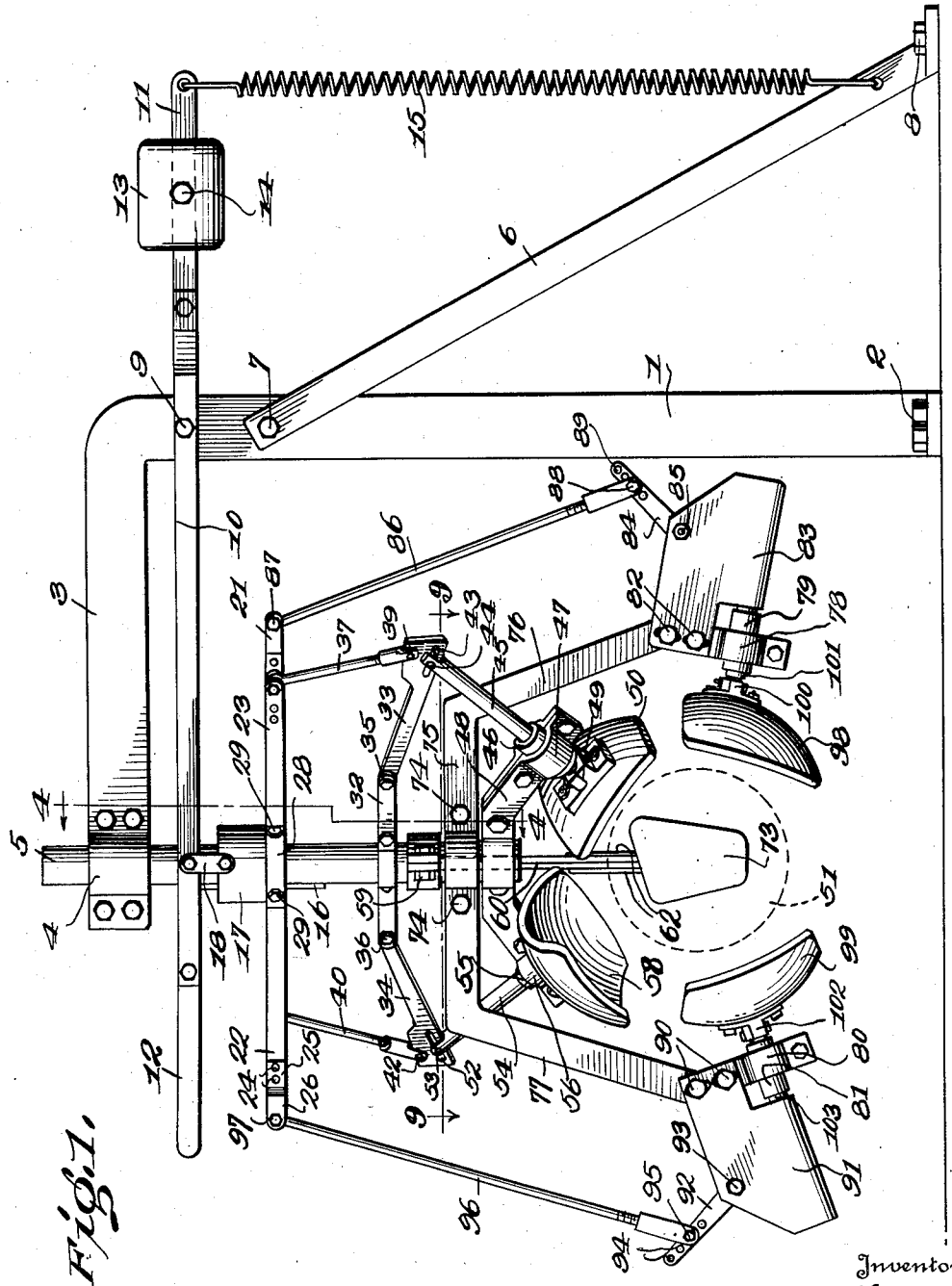


Fig. 1.

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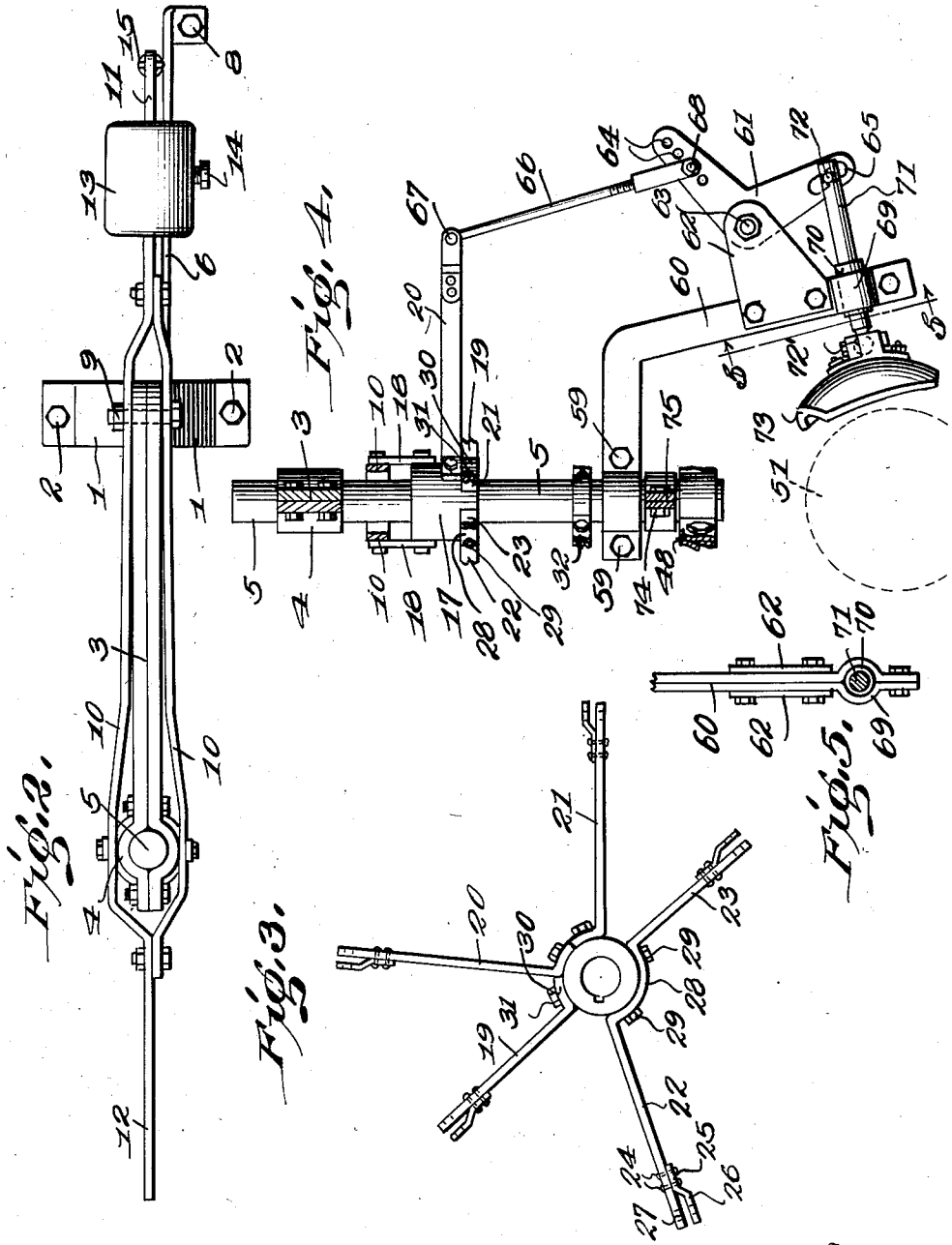


Fig. 2.

Fig. 4.

Fig. 3.

Fig. 5.

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Fig. 6.

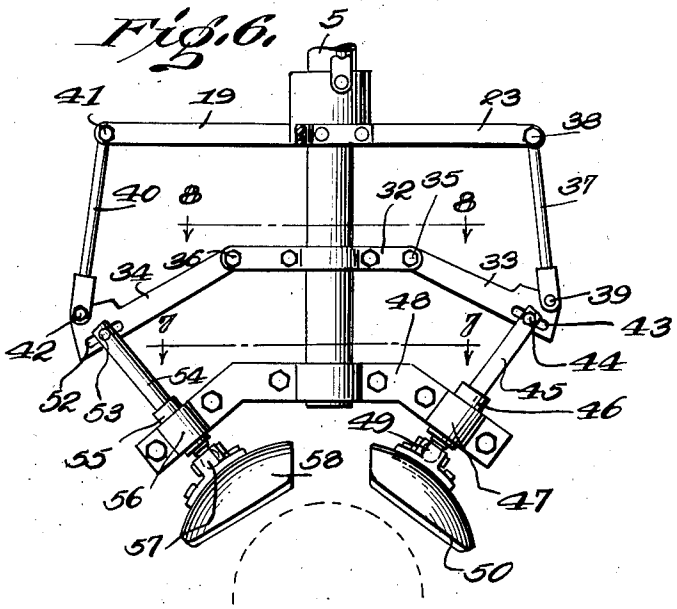



Fig. 7.

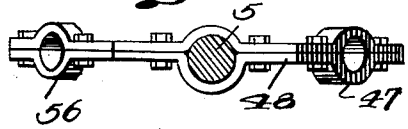



Fig. 8.

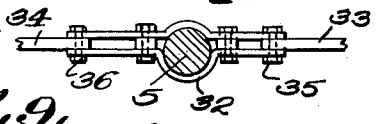
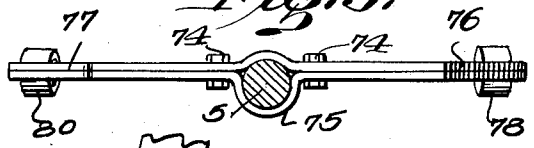



Fig. 9.



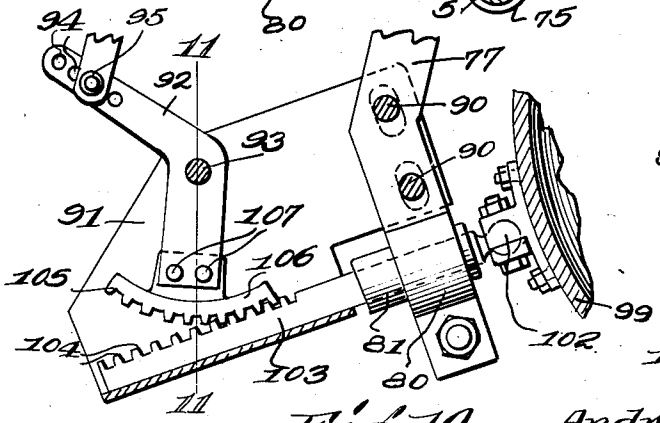




Fig. 10.

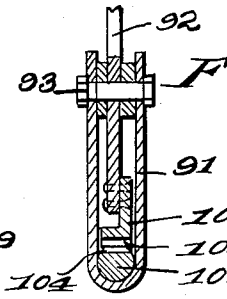



Fig. 11.

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Patented May 28, 1935 2,002,698

# UNITED STATES PATENT OFFICE

2,002,698

## PRINTING DEVICE

Andrew B. Kruczek, Detroit, Mich.

Application January 18, 1930, Serial No. 421,753

5 Claims. (Cl. 101—35)

My invention relates to new and useful improvements in a printing device and more particularly to such a device for printing the map of the world on rubber globes or spheres such as toy balloons, rubber bouncing balls, or the like.

The principal object of the invention resides in the provision of a printing device which is relatively simple and inexpensive in construction and which may be mounted upon a suitable support such as a table or the like.

Another object of the invention consists in the provision of a device of the character described in which there is a separate printing element for each continent as follows:—North America, South America, Asia and Europe, Africa and Australia, each of the printing elements being of a contour as to engage the surface of the globe or sphere being printed upon.

Still another object of the invention resides in the provision of means whereby printing elements may be operated in unison from a single control lever.

With the above and other objects in view, which will appear as the description proceeds, my invention consists in the novel details of construction and arrangement of parts, described in the following specification and illustrated in the accompanying drawings, and while I have illustrated and described the preferred embodiments of the invention, as they now appear to me, it will be understood that such changes may be made as will fall within the scope of the appended claims.

In the drawings:—

Fig. 1 is a side elevation.

Fig. 2 is a top plan of the supporting standard and operating lever.

Fig. 3 is a plan of the slidable operating mechanism and associated parts.

Fig. 4 is a section on the line 4—4 of Fig. 1 looking in the direction of the arrows.

Fig. 5 is a section on the line 5—5 of Fig. 4 looking in the direction of the arrows.

Fig. 6 is a fragmental detail showing in elevation a pair of opposed printing elements and operating means therefor.

Fig. 7 is a horizontal section on the line 7—7 of Fig. 6 looking in the direction of the arrows with parts removed.

Fig. 8 is a section on the line 8—8 of Fig. 6 looking in the direction of the arrows with parts removed.

Fig. 9 is a section on the line 9—9 of Fig. 1 looking in the direction of the arrows with parts removed.

Fig. 10 is a fragmental detail partly in section and partly in elevation of one of the printing members and operating mechanism therefor; and

Fig. 11 is a section on the line 11—11 of Fig. 10.

In the drawings 1 indicates a standard secured to a suitable support by means of the screws or bolts 2. The standard is provided at its upper end with the horizontally extending arm 3 provided adjacent its outer end with an eye 4 in which is clamped the rod 5 which depends from the arm as clearly shown in the drawings. At 6, I have shown a brace secured at its upper end to the standard 1 by means of the bolt 7 or other suitable fastenings and at its lower end secured to the support by means of the screws 8 or other suitable fastenings. Pivotally connected to the standard 1, at 9, is a lever 10 the lever having at one end an extension 11 and at its opposite end a hand grip 12. A weight 13 is adjustably mounted on the extension 11 and held in its adjusted positions by means of a screw 14. A coiled spring 15 has its upper end secured to the extension 11 of the lever 10 and its lower end secured to the brace 6. This spring 15 cooperating with the weight 13 holds the end of the lever 10 having the hand grip 12 normally in raised position.

The rod 5 is provided with the longitudinally extending key 16 and slidably mounted on the rod 5, and held against rotation thereon, by means of the key 16, is a collar 17 connected to the lever 10 by means of links 18. Secured to the collar 17 are the arms 19, 20, 21, 22 and 23 to the outer end of each of which is secured, by means of the rivets 24 or other suitable fastenings, a plate 25 having the perforated offset portion 26. The perforations in the offset portions of the plates are in alignment with openings or perforations 27 formed adjacent the outer end of each of the arms. As shown more clearly in Fig. 3 of the drawings the arms 22 and 23 are formed integral and connected by the arcuate-shaped portion 28 which engages the collar 17 and is secured thereto by means of the screws 29 or other suitable fastenings. Each of the arms 19, 20 and 21 is formed on its inner end with an angular extension 30 curved to conform to the curvature of the collar 17 and extending through each of these angular extensions is a screw 31 or other suitable fastening whereby the arms are secured to the collar.

Secured to the rod 5, beneath the collar 17, by means of the clamping plates 32, are the arms 33 and 34, the arm 33 being pivotally connected at 35 to one end of the clamping plates 32 and

the arms 34 being pivotally connected at 36 to the opposite end of the plates. These arms 33 and 34 are adapted for vertically swinging movement and the arm 33 is connected to the arm 23 by means of the rod 37 which is pivotally connected at 38 to the arm 23 and at 39 to the arm 33. The arm 34 is connected to the arm 19 by means of the rod 40 pivotally connected to the arm 19 at 41 and to the arm 34 at 42. The upper ends of the rods 37 and 40 are held between the ends of the respective arms 23 and 19 and the offset portions 26 of the plates 25 carried thereby. The arm 33 is provided, adjacent its outer end, with an elongated opening 43 in which operates a pin 44 connecting the rod to the arm 33, the rod 45 being slidably mounted through the bushing 46 carried in an eye 47 of the bracket 48 secured to the rod 5 adjacent the lower end thereof. Secured to the lower end of the rod 45, beneath the eye 47 of the bracket 48, by means of the ball and socket connection 49, is a printing element 50 of the shape shown quite clearly in the drawings and adapted to conform to the curvature of a sphere indicated generally at 51 which is to be printed upon. Through means of the ball and socket connections 49 the printing element 50 may be adjusted but it will be understood that after such adjustment the connection is tightened so that the element will remain in its adjusted position. The arm 34 is provided, adjacent its outer end with an elongated opening 52 in which operates a pin 53 which connects a rod 54 to the arm 34. This rod 54 is slidable through a bushing 55 which is clamped in the eye 56 formed in the bracket 48. Secured to the lower end of the rod 54, by means of the ball and socket connection 57 is a printing element 58 similar to the element 50.

Secured to the rod 5, adjacent the lower end thereof, by means of the bolts 59 or other suitable fastenings, is a depending arm 60 to which the bell crank lever 61 is secured by means of the plates 62. The bell crank lever is pivotally connected to the plates at 63 and one arm thereof is provided with the perforations 64 whereas the other arm is provided with the elongated opening 65. The arm of the bell crank lever having the openings 64 is connected to the arm 20 by means of the rod 66, the upper end of the rod 66 being pivotally connected to arm 20 at 67 whereas the lower end thereof is pivotally connected to the bell crank lever at 68, the pivot pin being positioned in one of the perforations 64. By providing a plurality of the perforations 64 the connection of the end of the rod 66 with the arm of the bell crank lever may be adjusted. The upper end of the rod 66 is positioned between one face of the arm 20 and the offset portion 26 of the plate 25 carried thereby. Adjacent its lower end the arm 60 is formed with an eye 69 in which is clamped a bushing 70. A rod 71 is slidably mounted in the bushing 70 and one end thereof is connected to the bell crank lever 61 by means of the pin 72 which extends into the elongated opening 65 of one arm of the bell crank lever. Secured to the opposite end of the rod 71, by means of the ball and socket joint 72' is a printing element 73 of the shape shown and of a curvature to correspond to the curvature of the sphere 51 which is adapted to receive the printed matter.

Secured to the rod 5, by means of the bolts 74 or other suitable fastenings, is a bracket member 75 having the depending arms 76 and 77, as more particularly illustrated in Fig. 1 of the drawings, the depending arm 76 being formed adjacent its lower end with an eye 78 in which is clamped a bushing 79. The arm 77 is formed, adjacent its lower end with an eye 80 in which is clamped a bushing 81. Secured to the depending arm 76, by means of the bolts 82 or other suitable fastenings, is a substantially U-shaped guide member 83 between the side plates of which is received and operates a lever indicated generally at 84, this lever being pivotally connected at 85 to the side plates of the guide member, as shown more particularly in Fig. 1 of the drawings. The lever 84 is connected to the arm 21, by means of the rod 86, the upper end of the rod being pivotally connected at 87 to the arm 21 while the lower end of the rod is pivotally connected at 88 to the lever. A plurality of perforations 89 are formed in the lever 84 and the pin, forming the connection 88, may be placed through either one of the openings or perforations 89 for adjusting purposes. Secured to the depending arm 77, by means of the bolts 90 or other suitable fastenings, is the substantially U-shaped guide member 91 similar to the guide member 83 and between the side plates of which operates a lever 92 similar to the lever 84. The lever 92 is pivotally connected to the guide member at 93 and is provided with a plurality of perforations 94 to receive a pin 95 which pivotally connects the lower end of a rod 96 to the lever. This rod 96 forms a connection between the lever 92 and the arm 22, the upper end of the rod being pivotally connected to the arm at 97. The upper ends of the rods 86 and 96 are positioned between the face of their respective arms and the offset portions 26 of the plates 25.

Printing elements 98 and 99 are carried respectively by the arms 76 and 77 the element 98 being connected by means of a ball and socket joint 100 to a rod 101 which slides in the bushing 79 and the printing element 99 is connected by means of the ball and socket joint 102 to the rod 103 which slides in the bushing 81. As each of the levers 84 and 92 and the rods 101 and 103 are of similar formation a detail description of one will suffice for both and with this in mind reference is made more particularly to Figs. 10 and 11 of the drawings. As shown each of the rods 101 and 103 is formed with the teeth 104 which are engaged by the teeth 105 formed on the segment 106 secured to the levers 84 and 92 by means of the bolts 107 or other suitable fastenings.

Each of the printing elements will be of a size and shape adapting them for printing upon a sphere of the desired size and the type, not shown, forming a part of the printing elements, will be made of type metal engraved or acid etched.

As previously stated my printing device is primarily intended for printing the map of the world upon a sphere and there is a separate printing element for each of the continents. The element 73 will print Africa, the element 50 North America, the element 57 Asia and Europe, the element 98 South America, and the element 99 Australia. Normally the parts will be positioned as shown more particularly in Fig. 1 of the drawings and when the map is to be printed the sphere 51 will be positioned as shown in dotted lines and the hand grip 12 of the lever 10 grasped by the operator. By pushing down on the lever the collar 17 will be lowered and carry with it the arms 19, 20, 21, 22 and 23. The lowering of

the arms causes the rod **66**, carried by the arm **20**, to swing the bell crank lever **61** to engage the printing element **73** with the sphere, causes the rods **37** and **40** to swing the arms **33** and **34** to in turn operate the rods **45** and **54** to bring the elements **50** and **57** into contact with the sphere, and to cause the rods **86** and **96** to operate the levers **84** and **92** which in turn slide the rods **101** and **103** in the guide members **83** and **91** respectively to cause the elements **98** and **99** to be engaged with the sphere. As previously brought out the printing elements are of such a size and shape as to conform with the curvature of the sphere and to properly engage the surface thereof to print thereon. When the printing has been completed the operator releases the hand grip **12** of the lever **10** and the same is returned to its original position by means of the weight **13** and spring **15** and carries with it the collar **17** which operates upon the several members for releasing the printing elements from the sphere. It will be noted that I have provided a device of the character described which is relatively simple in construction and which is of such a size that it may be supported by a table or other suitable object.

Through means of the ball and socket joints the several printing elements may be positioned or adjusted to properly contact with the sphere. It will be understood that after being adjusted the connections will be tightened to hold the elements in their adjusted positions.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A printing device of the character described including a standard, a rod carried by and depending from the standard, means carried by the rod for supporting a plurality of printing elements, arms carried by the rod, connecting means between the arms and printing elements, and means for operating the arms to in turn operate the printing elements.

2. A printing device of the character described including a standard, a rod carried by the standard and depending therefrom, means carried by the rod for supporting a plurality of printing elements for sliding movement, arms carried by the rod, connecting means between the arms and printing elements, and means for operating the arms to slide the printing elements.

3. A printing device of the character described including a standard, a rod carried by the standard and depending therefrom, means carried by the rod for supporting a plurality of printing elements for sliding movement, a collar slidable on the rod, arms connected to and carried by the collar, connecting means between the arms and printing elements, and means for sliding the collar to operate the printing elements.

4. A printing device of the character described including a standard, a rod carried by the standard and depending therefrom, brackets carried by the rods and provided with bearing portions, a plurality of printing elements having portions operable in the bearings of the brackets for sliding movement, a collar slidable on the rod, arms connected to and carried by the collar, connecting means between the arms and printing elements, and means for sliding the collar to operate the printing elements.

5. A printing device of the character described including a supporting member, a plurality of printing elements carried by the supporting member and adapted for sliding movement, vertically movable arms slidably mounted on the supporting member, connecting means between the arms and printing elements, and means for moving the arms vertically to in turn slide the printing elements.

ANDREW B. KRUCZEK.