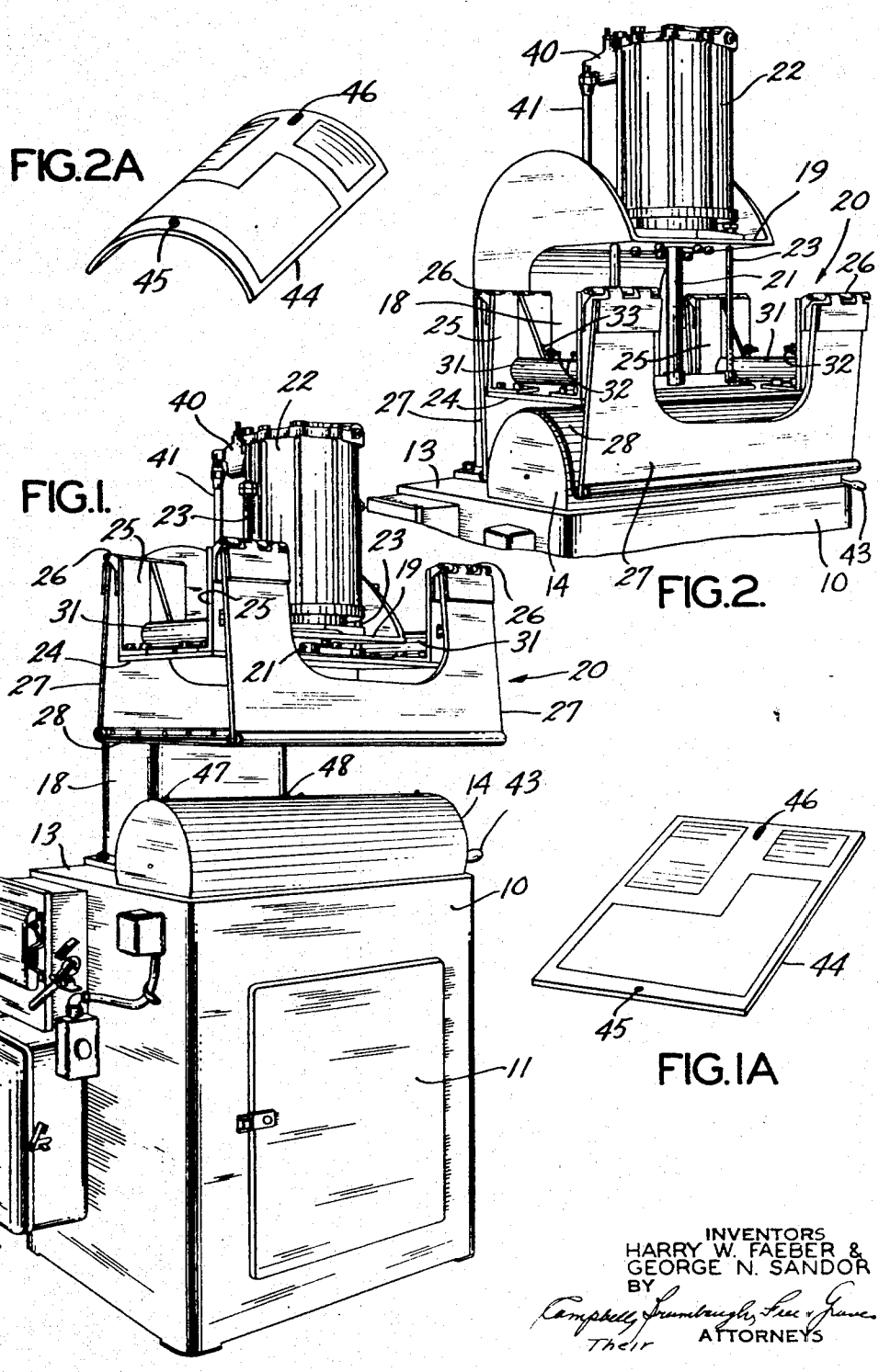
Aug. 31, 1954 H. W. FAEBER ET AL 2,687,762

APPARATUS FOR CURVING PRINTING ELEMENTS

Filed May 17, 1950 4 Sheets-Sheet 1



INVENTORS
HARRY W. FAEBER &
GEORGE N. SANDOR
BY
Campbell, Brumbaugh, Free & Graves
Their ATTORNEYS

Aug. 31, 1954 H. W. FAEBER ET AL 2,687,762

APPARATUS FOR CURVING PRINTING ELEMENTS

Filed May 17, 1950 4 Sheets-Sheet 2

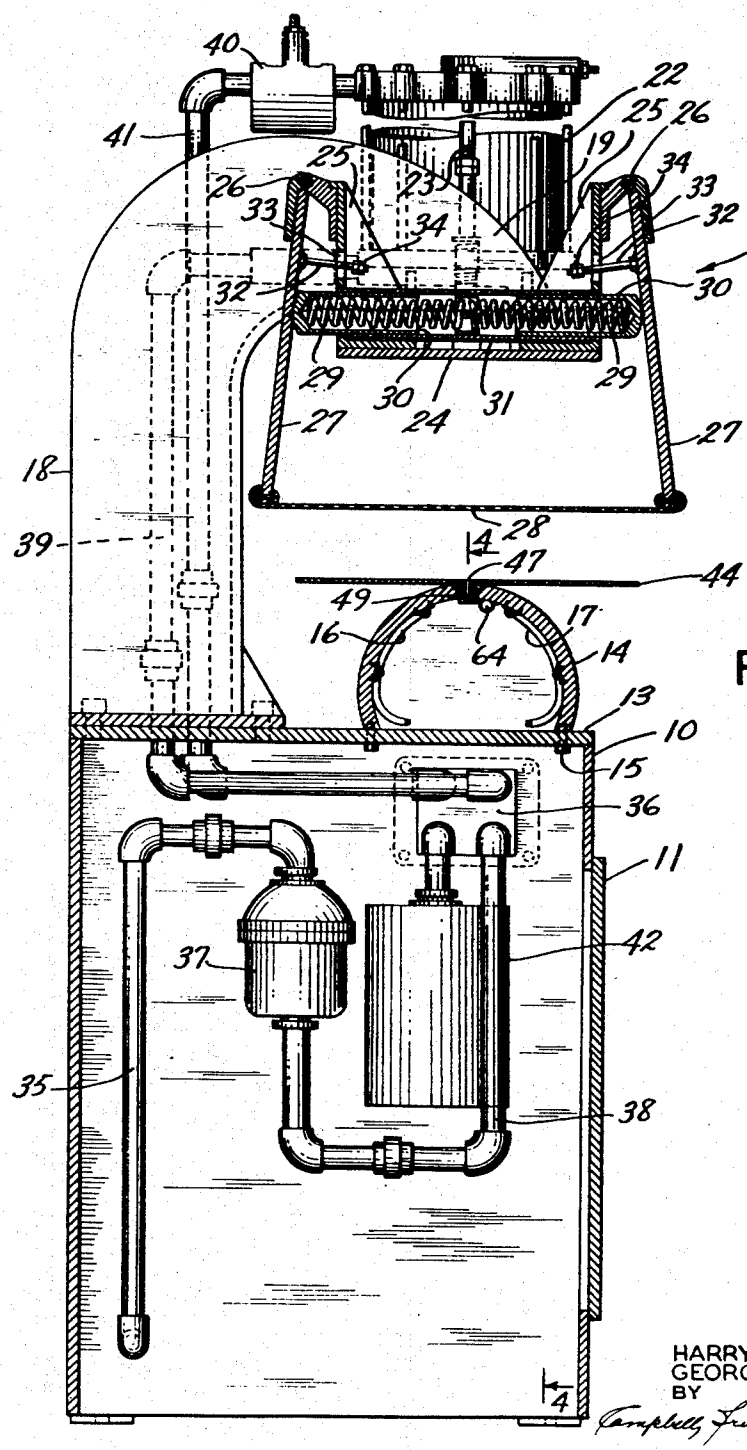


FIG. 3.

INVENTORS
HARRY W. FAEBER &
GEORGE N. SANDOR
BY
Campbell, Trumbull, Price & Graves
Their ATTORNEYS

APPARATUS FOR CURVING PRINTING ELEMENTS

Filed May 17, 1950 4 Sheets-Sheet 3

FIG. 4.

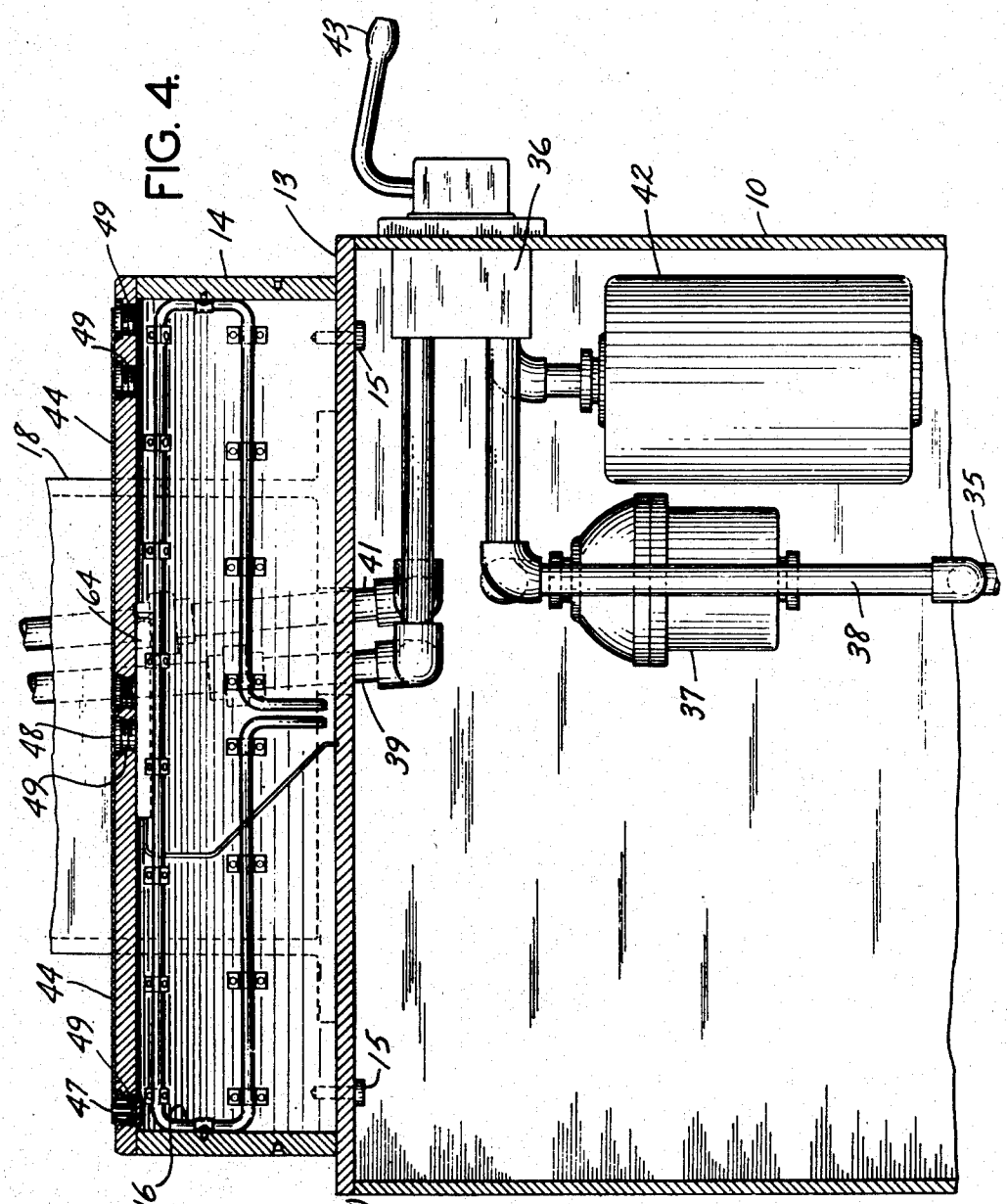
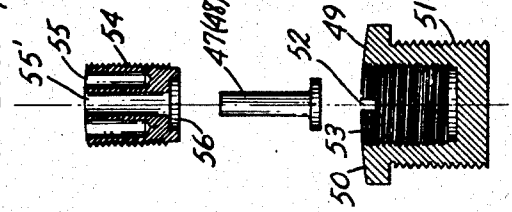


FIG. 5.



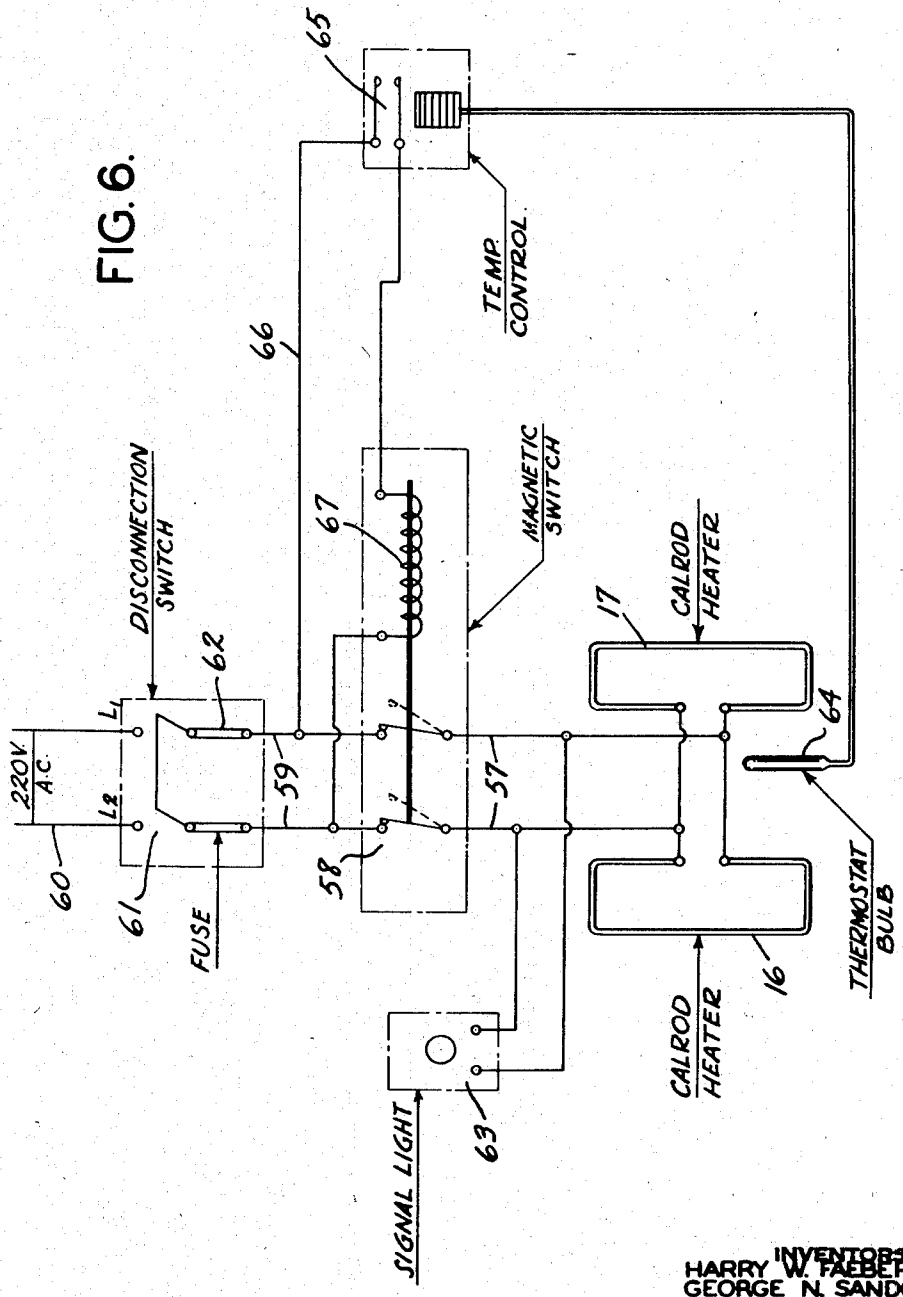
INVENTORS
HARRY W. FAEBER &
GEORGE N. SANDOR
BY
Campbell, Brumbaugh, Free & Graves
Their ATTORNEYS

Aug. 31, 1954 H. W. FAEBER ET AL 2,687,762

APPARATUS FOR CURVING PRINTING ELEMENTS

Filed May 17, 1950 4 Sheets-Sheet 4

FIG. 6.



INVENTORS
HARRY W. FAEBER &
GEORGE N. SANDOR
BY
Campbell, Trumbauer, Lee & Graves
Their ATTORNEYS.

Patented Aug. 31, 1954

2,687,762

UNITED STATES PATENT OFFICE

2,687,762

APPARATUS FOR CURVING PRINTING ELEMENTS

Harry W. Faeber, Larchmont, and George N. Sandor, Mamaroneck, N. Y., assignors to Time Incorporated, New York, N. Y., a corporation of New York

Application May 17, 1950, Serial No. 162,526

3 Claims. (Cl. 153—51)

1

The present invention relates to mechanisms for curving printing plates, such as electro-types, which are to be used upon the printing cylinders of printing presses.

Heretofore printing plates of the above character have been manufactured by conventional photo-mechanical and etching processes, following which electro-types are made, the end product of which is a printing plate that is curved to conform to the curved surface of the printing cylinder. The plate is used by being secured to the printing cylinder by means of lugs or clamps that engage the edges of the plate under pressure and clamp the plate to the outer surface of the printing cylinder. Being molded of lead, these plates are extremely heavy and present certain limitations to the operations above mentioned which have long been recognized in the art.

There has been recently developed a process by means of which relief printing plates are made by laminating a thin shell to a back-up material formed of aluminum or similar relatively light material and precurved to conform to the curvature of the printing cylinder. In this connection, it is desirable to form the shell flat, and then finally curve it to substantially the curvature of the curved cylinder. It is an object of the present invention to provide means by which this curving operation may be accomplished.

A further object of the invention is to provide a mechanism of the above character wherein the desired curving operation above referred to is accomplished surely and effectively and while maintaining the areas of the printing surface in a desired condition of registration so that when the laminated plate is completed, it will be formed to register precisely with the desired areas of the printing cylinder.

Further objects and advantages of the invention will be apparent as it is described in detail in connection with the accompanying drawings, wherein

Figure 1 is a perspective view from the front and side, showing a curving machine constructed in accordance with the present invention;

Figure 1*a* is a perspective view showing a printing plate or shell in the flat position;

Figure 2 is a partial view similar to Figure 1, showing the curving head moved into the curving position;

Figure 2*a* is a perspective view showing a printing plate or shell that has been curved by the operation illustrated in Figure 2;

Figure 3 is an end view, partly in section, showing certain details of the mechanism shown in Figures 1 and 2;

2

Figure 4 is a view in section, taken on the line 4—4 of Figure 3, and looking in the direction of the arrows;

Figure 5 is an exploded view of the register pin and cartridge shown in Figures 3 and 4; and

Figure 6 is a diagrammatic view showing the electrical circuits by means of which the temperature of the saddle is controlled.

With reference to the above drawings, the curving machine is shown as being formed with a base housing 10 having a front access door 11 and at its side suitable control boxes 12 for housing the mechanism to be referred to hereinafter. The top of the housing 10 is provided with a table 13 upon which a curving saddle 14 is secured as, for example, by means of bolts 15. The curving saddle is provided, on its interior, with electrical heating elements 16 and 17 which may take the form of high resistance heating elements known generally as "Calrod" heaters. The manner in which these heating elements are energized will be described presently.

At the rear of the table 13 a vertical standard 18 is secured, the standard being formed with a forwardly projecting portion 19 upon which a curving head, indicated generally at 20, is mounted.

The curving head is mounted upon a piston rod 21 which is slidable within an air cylinder 22, side guide rods 23 being provided to assist in guiding the vertical movements of the curving head.

The curving head is formed of a plate 24 upon which a plurality of pairs of brackets are secured, the brackets terminating upwardly in hinges 26 from which downwardly extending side plates 27 depend. A bending plate or blanket 28 is secured to the bottom edges of the side plates 27 and is normally maintained under tension by means of a plurality of springs 29 that press outwardly upon plungers 30 that are carried within spring guide sleeves 31 secured to and between the pairs of brackets 25. In this fashion the coil springs 29, urging the plungers 30 outwardly, bear against the side plates 27 and likewise force them outwardly in order to maintain the blanket or plate 28 under tension as illustrated in Figure 3. Outward movement of the side plates 27 is limited by means of bolts 32 which are welded or otherwise secured to the one end of the side plates 27 and extend through slots 33 formed on the brackets 25. The extent of movement of the bolts 32 may be adjusted by means of nuts 34, as illustrated in Figure 3.

Up and down movement of the curving head 20 is controlled by air under pressure obtained

through a supply pipe 35 which is connected to an air control valve 36 through an air filter 37 and related piping 38. From the air control valve 36 piping 39 draws the air into the cylinder 22 beneath the piston (not shown) therein that is carried at the upper end of piston rod 21. Air from the upper end of the cylinder 22 is discharged through an adjustable air speed control valve 40, which may be of conventional form, and piping 41 to the control valve 36 and an exhaust muffler 42. A suitable handle 43 provides means for manually controlling the flow of air to and from the cylinder 22 in order that air under pressure may be fed through either of the pipes 39 or 41 and exhausted from the cylinder through either of such pipes, in accordance with the desired operation of raising or lowering the curving head.

In operation, an electrotype shell 44 is placed upon the curving saddle 14 so that register holes 45 and 46 will fit over register pins 47 and 48 (Figure 4). Each register pin is secured in the saddle by means of cartridges 49, the upper surface 50 of which is curved to conform to the curvature of the saddle. Outer threads 51 of the cartridges enable them to be secured in previously recessed and threaded portions of the saddle with a tool, such as a screw driver, which will engage the slot or slots 52. The cartridges 49 are interiorly threaded at 53 to receive a plug 54 having holes 55 formed therein to receive a suitable wrench. The plugs 54 are formed with a central hollow portion 55 within which the register pins 47 or 48 are received, an enlarged portion 56 being formed in order to receive the heads of the pins. With the plate secured over the register pins, as illustrated in Figure 3, the control valve 43 is actuated to cause the curving head to be lowered and the curving blanket or plate 28 wrapped around the electrotype shell so that it is curved simultaneously in opposite directions around the curving saddle 14. In the meantime, the heating elements 16 and 17 are energized to maintain the saddle at the desired temperature in the manner now to be described.

Referring to Figure 6, the heater elements 16 and 17 are connected across a line 57 and, through a switch 58, to line 59. Line 59 is connected to the supply line 60 by means of a disconnect switch 61 and fuses 62.

A signal light 63 is connected across line 57 to indicate that the heating elements are connected to the source of current, and a thermostat 64 is maintained within the curving saddle 14 in order to control a switch 65 that is connected across the line 59 by means of circuit 66, being in series with a solenoid mechanism 67 that is designed to open the switch 58 when the switch 65 is closed by the thermostat. Thus, when the switch 61 is closed, the heating begins, at which time the heaters 16 and 17 are connected to the supply line 60, and heat is applied at the curving saddle 14. When the temperature of the saddle has been increased to a desired amount, switch 65 is closed by the thermostat, and the solenoid operated switch 58 is opened.

While the invention has been described with specific reference to the accompanying drawings, it is not to be limited save as defined in the appended claims.

We claim:

1. Apparatus for bending printing plates comprising a table, a saddle having an upper semicylindrical surface on and extending lengthwise of said table, register pins extending upwardly from said saddle adjacent its opposite ends at about the mid-portion of said saddle to position a printing plate in predetermined relation to said saddle, a standard adjacent to one side of said table and extending upwardly therefrom, a cylinder on said standard above said saddle, a piston reciprocable in said cylinder and having a piston rod extending downwardly therefrom, a supporting plate fixed to the lower end of said piston rod and extending lengthwise of said table, brackets extending upwardly from opposite edges of said plate, side plates hingedly connected to said brackets and extending lengthwise of said table and downwardly from said brackets on opposite sides of said supporting plate, said side plates having free lower edges disposed below said supporting plate, a flexible blanket substantially coextensive in area with the area of the semi-cylindrical surface of said saddle, means connecting opposite edges of said blanket to said lower edges of said side plates to overlie said saddle, spring means interposed between said side plates and urging them apart to maintain said blanket in a tensioned condition, and means to supply fluid under pressure to said cylinder to project and retract said piston rod.

2. Apparatus for bending printing plates comprising a support, a saddle having an upper semicylindrical surface on said support, register pins extending upwardly from said saddle adjacent its opposite ends at about the midportion of said saddle to position a printing plate in a predetermined relation to said saddle, a standard adjacent to said support and extending upwardly therefrom, a supporting plate, means on said standard connected with said supporting plate for moving it toward and away from said saddle, brackets extending upwardly from opposite edges of said plate, side plates hingedly connected to said brackets and extending downwardly therefrom on opposite sides of said supporting plate, said side plates having their lower edges disposed below said supporting plate, a flexible blanket substantially coextensive in area with the area of the semicylindrical surface of said saddle and having its opposite edges connected to said lower edges of said side plates to hold said blanket in position overlying said saddle, and spring means interposed between said side plates and urging them apart to maintain said blanket under tension.

3. Apparatus for bending printing plates comprising a table, a saddle having an upper semicylindrical surface on and extending lengthwise of said table, register pins extending upwardly from said saddle adjacent its opposite ends, said register pins being positioned at about the midportion of said saddle to position a printing plate in fixed relation to said saddle, a standard adjacent to one side of said table and extending upwardly therefrom, a supporting plate, means on said standard connected with said plate for moving it toward and away from said saddle and positioning said plate lengthwise of said table, brackets extending upwardly from opposite edges of said plate, side plates hingedly connected to said brackets and extending lengthwise of said table and downwardly from said brackets on opposite sides of said supporting plate, said side plates having their lower edges disposed below said supporting plate, a flexible blanket substantially coextensive in area with the area of the semicylindrical surface of said saddle and having its opposite edges connected to said lower edges of said side plates to overlie said saddle and

spring means interposed between said side plates and urging them apart to maintain said blanket in a tensioned condition.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
50,602	Kriebel	Oct. 24, 1865
118,736	Marshall	Sept. 5, 1871
166,918	De Forest	Aug. 24, 1875
1,461,471	Bancroft	July 10, 1923
1,485,313	Taylor	Feb. 26, 1924
1,487,839	Claybourn	Mar. 25, 1924
2,279,965	Berliner	Apr. 14, 1942
2,418,100	Stewart	Mar. 25, 1947

FOREIGN PATENTS

Number	Country	Date
527,795	France	Apr. 2, 1921