

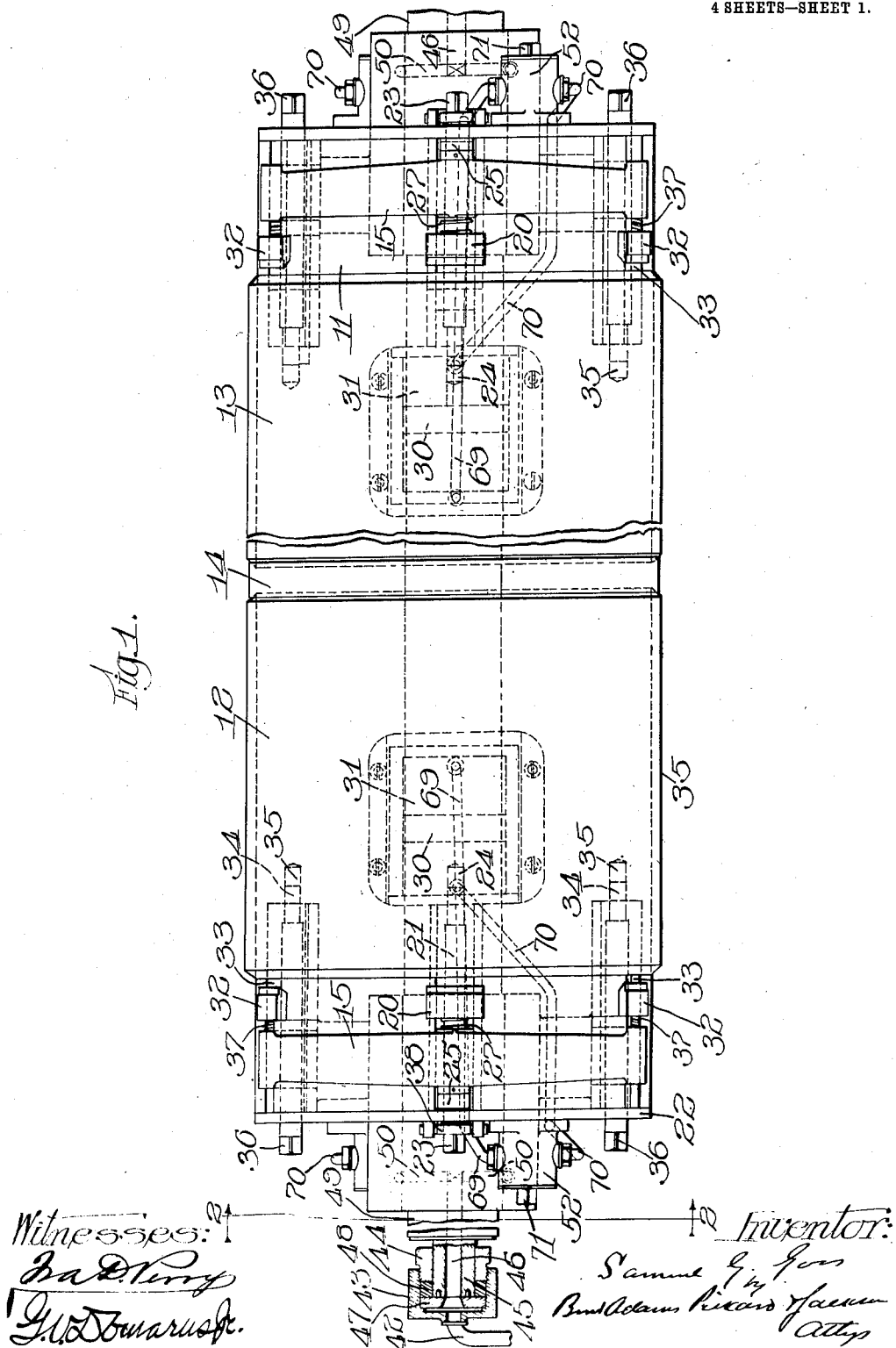
PLATE CLAMPING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED JUNE 14, 1909.

954,090.

Patented Apr. 5, 1910.

4 SHEETS—SHEET 1.

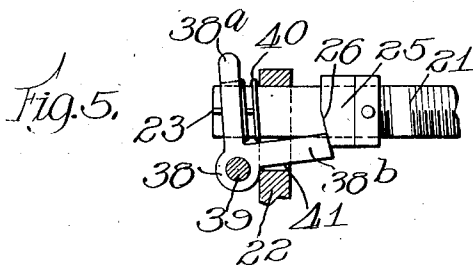
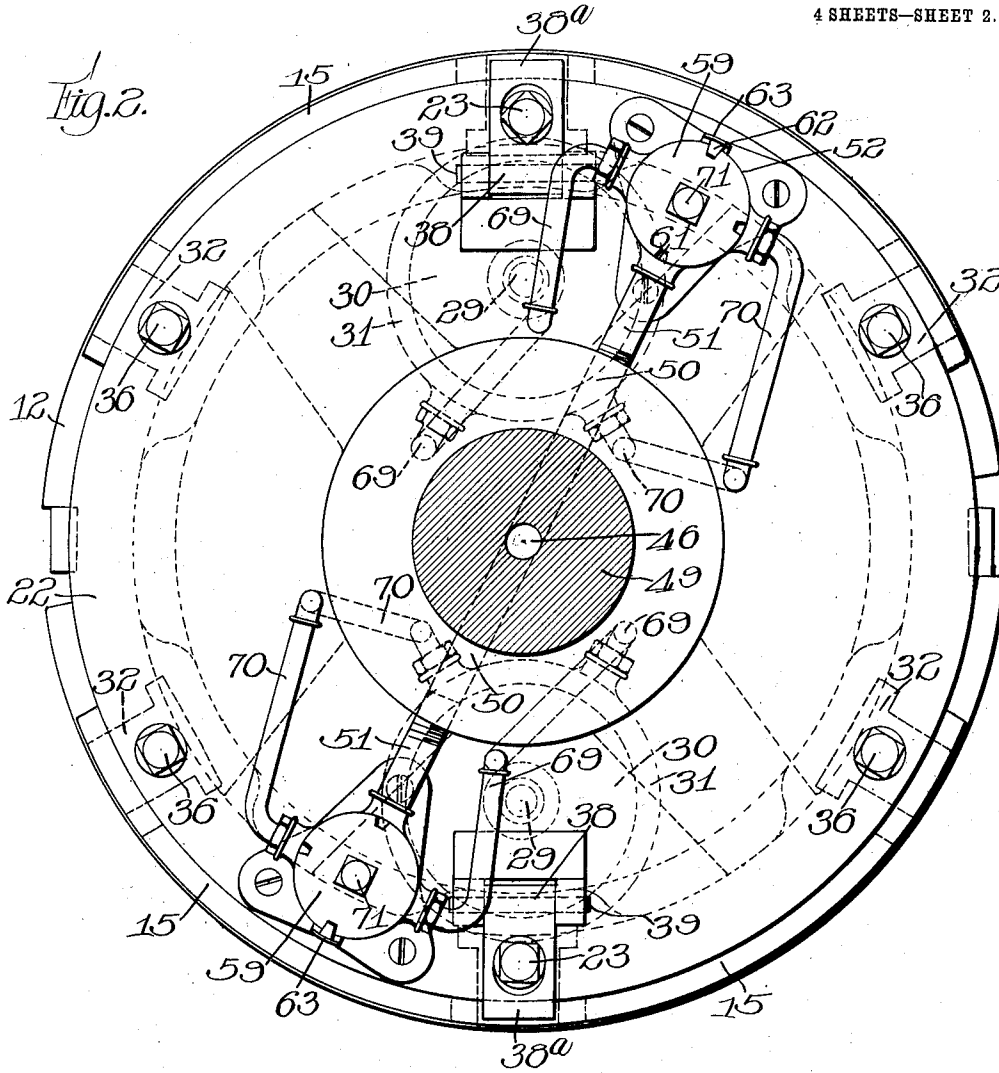


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4 SHEETS—SHEET 2.



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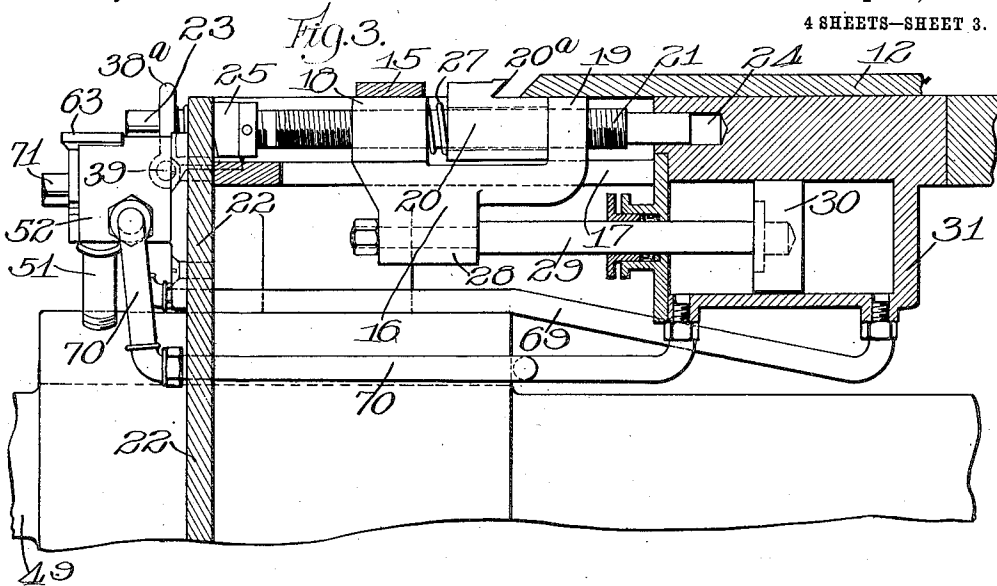
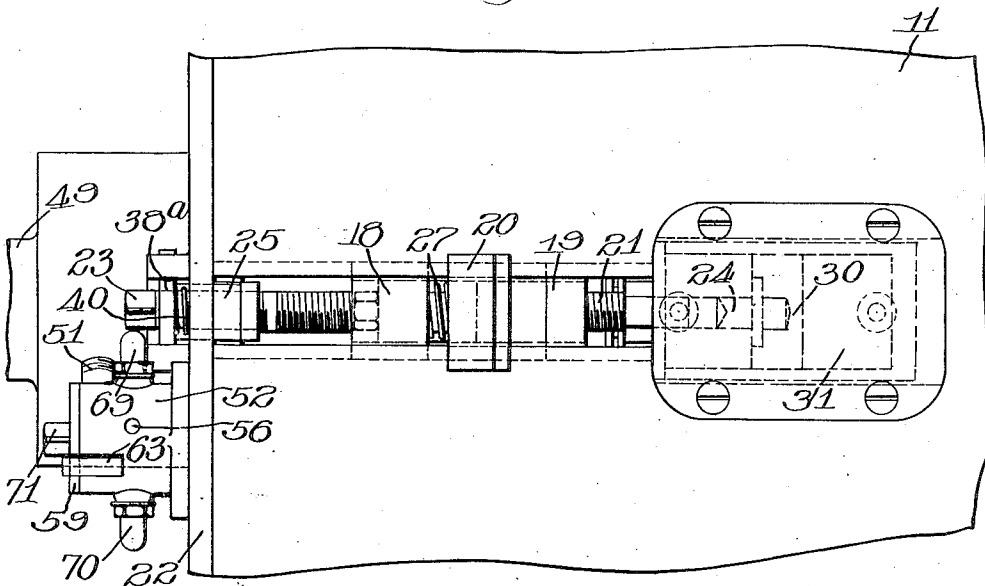


Fig. 4.



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Fig. 10.

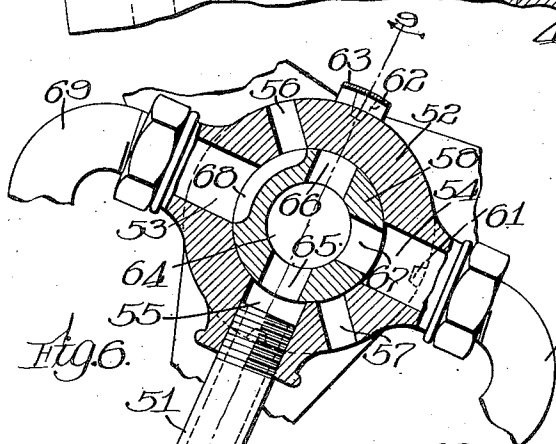
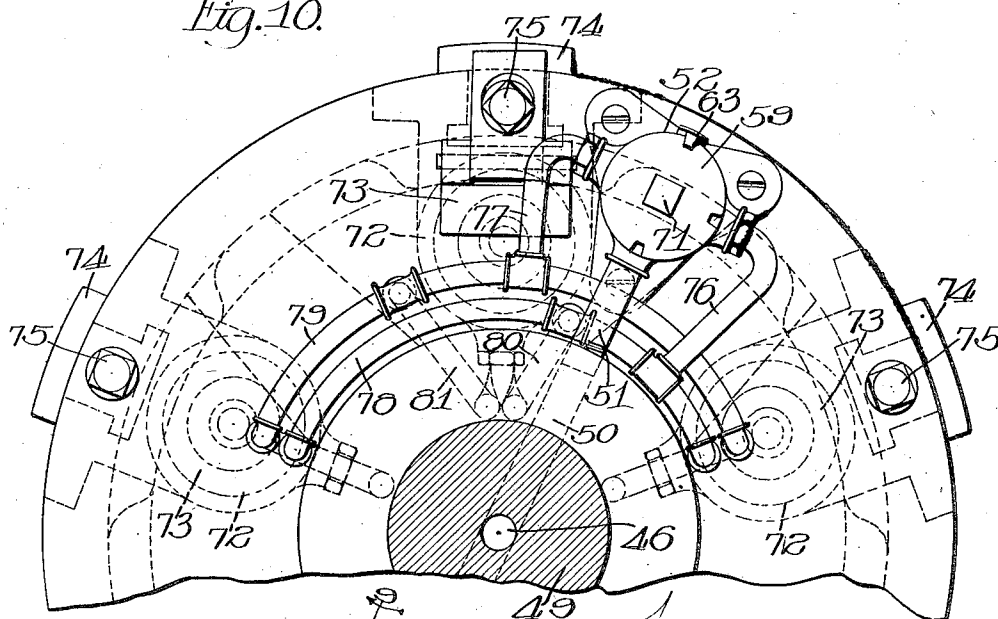


Fig. 6.

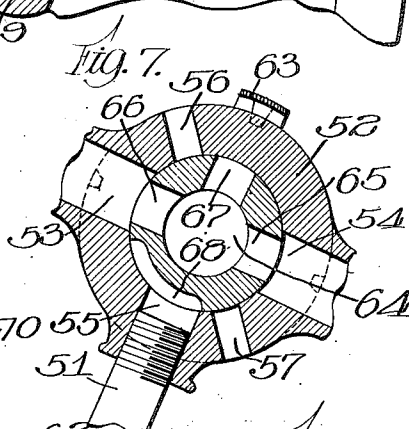


Fig. 7.

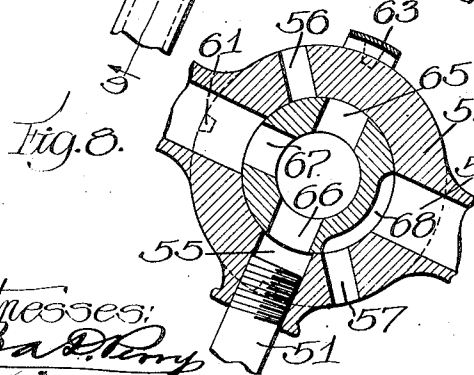


Fig. 8.

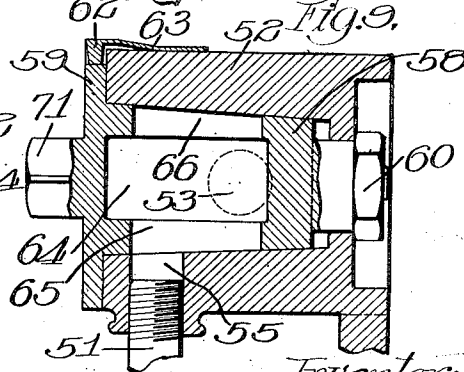


Fig. 9.

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UNITED STATES PATENT OFFICE.

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PLATE-CLAMPING MECHANISM FOR PRINTING-PRESSES.

954,090.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed June 14, 1909. Serial No. 502,130.

To all whom it may concern:

Be it known that I, SAMUEL G. GOSS, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Plate-Clamping Mechanism for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to plate clamping mechanism for printing presses, and its object is to provide a new and improved mechanism by which the clamps on a plate cylinder, independently movable longitudinally of the cylinder for the purpose of adjusting the clamps to plates of different widths, may be caused by pneumatically-operated mechanism to simultaneously move into engagement with and to be locked upon the edge of the plate in position on the cylinder.

My invention further consists in new and improved pneumatically-operated mechanism adapted for the operation of plate clamps upon a printing press cylinder in order to move a plurality of clamps simultaneously into engagement with and locking them upon the edge of a plate in position on said cylinder.

I accomplish these objects by the means illustrated in the drawings and hereinafter specifically described.

That which I believe to be new will be pointed out in the claims.

Figure 1 is a top or plan view of a plate cylinder containing my new and improved plate clamp operating mechanism, said cylinder being shown broken away for clearness of illustration. Fig. 2 is an enlarged end view of the cylinder on line 2—2 of Fig. 1. Fig. 3 is an enlarged detail, being a vertical section through one end of the cylinder, showing the clamp-operating mechanism. Fig. 4 is a top or plan view of the parts shown in Fig. 3. Fig. 5 is an enlarged detail of the locking lever which locks the clamps in position upon the plate. Figs. 6, 7 and 8 are vertical sections of the controlling valve, showing the valve in different positions. Fig. 9 is an enlarged detail, being a section on line 9—9 of Fig. 6. Fig. 10 is an enlarged end view of the plate cylinder, showing a modification of my apparatus.

11 indicates a plate cylinder upon which are mounted plates 12—13 which extend

around one semi-circumference of the cylinder, and at their inner edges abut against the center stop 14 in the usual manner. The cylinder represents an ordinary two plate wide cylinder printing press, which for purpose of convenience I have chosen to illustrate in describing my improvements; for it is obvious that cylinders of other widths may be used.

As my improved plate clamping mechanism which I am about to describe is mounted in duplicate upon each end of the cylinder, it will be necessary to describe in detail only the mechanism upon one end, it being understood that the mechanism upon the other end is precisely the same.

15 indicates curved yokes of a length somewhat less than a semi-circumference of the cylinder, as is best shown in Fig. 2, and so shaped as to conform to the shape of the surface of the cylinder at the end beyond the plates 12—13. A pair of these yokes is placed upon each end of the cylinder, one yoke being adapted to operate as hereinafter described the mechanism for locking one plate, and the other to operate the mechanism for locking the other plate upon the other semi-circumference.

Referring to Fig. 3, 16 indicates a hanger which is secured to or formed integral with the yoke 15 and which, located below the middle of the yoke, extends toward the interior of the cylinder through a slot 17 so as to move freely in said slot longitudinally of the cylinder. The yoke 16 is so formed as to have two heads 18—19 between which is mounted a plate clamp 20 hereinafter described.

21 indicates a screw which passes through suitable threaded openings in the heads 18—19 of the hanger 16 and at its outer end passes through the end plate 22 of the cylinder and is provided with a head 23 by means of which the screw may be turned. The inner end of the screw 21 passes into a cylindrical opening 24 in the body of the cylinder so as to move longitudinally therein, the screw 21 being journaled in said opening and in the end plate 22 of the cylinder.

25 indicates a head which is secured upon the screw 21 inside of the plate cylinder end 22 and normally bears against the inside surface thereof. The head 25 is provided with a cam surface 26, as best shown in Fig. 5, for

purposes hereinafter described. The clamp 20 is mounted on the screw 21 so as to slide freely thereon and is provided with an engaging shoulder 20^a beveled so as to engage the beveled outer edge of the plate 12—13, as hereinafter described.

27 indicates a spiral spring interposed between the plate clamp 20 and the head 18 of the hanger 16 so as to spring-seat the clamp 20 on the screw 21 between the heads 18—19 of the hanger 16. The hanger 16 is provided with a depending bracket 28 preferably formed integral therewith, in which is secured the outer end of a piston-rod 29 of a piston 30 which slides air-tight in a cylinder 31.

32 indicates plate clamps which are slidably mounted in the usual manner in slots 33 on the plate cylinder and are adapted to engage the edges of the plates 12—13 near the outer ends of the plates. The clamps 32 sliding in the slots 33 are mounted upon screws 34 which pass through suitable screw-threaded openings in the lower portions of the clamps 32 and which are journaled in the end plate 22 and at their other ends in suitable openings 35 in the body of the cylinder. The screws 34 are capable of a limited longitudinal movement in the cylinder by means of the openings 35 for the purpose of the simultaneous locking of the clamps as hereinafter described and are provided on their outer ends with heads 36 by means of which they may be turned. The turning of the screw heads 36 operates, each separately, the clamps 32 in the ordinary manner so as to adjust them upon the cylinder to different widths of plates. The screws 34 pass through suitable openings on the under side of the yokes 15 near their ends.

37 indicates spiral springs interposed between the ends of the yoke 15 and the plate clamps 32. It will be obvious that by turning the screw 21, the hanger 16, yoke 15 and the plate clamp 20 may be moved longitudinally of the cylinder so as to adjust the clamp to different widths of plate. By the turning of the screws 34, the clamps 32 may be also adjusted independently of the yoke 15 and independently of each other to different widths of plate.

The adjustment being made to the different widths of plate and the parts being in the position shown best in Figs. 1, 3 and 4, it is obvious that an inward movement of the piston 30 will carry with it the hanger 16 and the yoke 15 and that the plate clamps 20 and 32 will be simultaneously moved longitudinally of the cylinder against the edge of the plate, the springs being sufficiently strong but yielding in their engagement so as to allow for any irregularities in the edges of the plate.

Referring to detail Fig. 5, 38 indicates a bellcrank lever pivoted upon a suitable pivot

39 outside of the cylinder end 22 and provided with arms 38^a and 38^b. The arm 38^a projects upward and has interposed between it and the outer surface of the cylinder end 22 a spiral spring 40. The inner arm projects into the cylinder through a suitable opening, as 41, and is adapted at its outer end to engage with the cam surface 26 of the head 25 as soon as free to do so, the spring 40 tending to normally hold the parts in the position shown in Fig. 5. When the yoke 15 is moved inward, as above described, so as to move the clamps simultaneously into engagement with the edge of the plate, the screws of course are carried inward with it and the head 25 is so placed that as soon as the plate clamps become locked upon the plate the parts reach the position shown in Fig. 5, in which position the arm 38^a, being free to move toward the screw 21, is lifted into the position shown in Fig. 5 by the operation of the spring 40, and, engaging the cam or beveled surface 26 of the head 25, prevents the return of the parts and locks the yoke 15 against return movement and consequently locks the plate clamps upon the plate.

When it is desired to remove the plates and the yoke 15 is moved toward the outer end of the cylinder by the operation of the piston in the manner hereinafter described, the arm 38^a of the bellcrank lever 38 is pushed inward by hand against the action of the spring 40, leaving the parts free to return to the original position shown in Fig. 3.

The piston in the cylinder 30 is operated by the following described mechanism. 42 indicates a pipe which leads from any suitable source of compressed air supply and which is connected with and opens into a cap 43 which is screw-threaded upon a ring 44 which is revolubly mounted upon the axle 45 of the plate cylinder, the axle 45 being provided with a central boring 46 registering with the opening in the pipe 42. The parts are held in position by means of a plate 47 secured to the outer end of the axle 45 which plate forms a flange around the outer end of the axle and is centrally bored and between the center surface of which and the inner edge of the collar 44 is interposed a suitable packing 48. A similar device (not shown) is placed of course upon the other end of the cylinder.

Within the hub 49 of the cylinder, the opening 46 is connected with two transverse borings 50 extending radially of the hub.

51 indicates pipes which are screwed into the tubular borings 50 connecting with the axial boring 46.

52 indicates a cylindrical valve casing provided with openings 53—54—55—56—57, into one of which openings, —55,— the outer end of the tube 51 is screwed. The openings

53 and 54 are diametrically opposite each other and the openings 56 and 57 are preferably arranged diametrically opposite each other.

58 indicates a rotary valve which is journaled in the valve casing 52 and is secured therein by means of a head 59 bearing upon the outer surface of the valve-casing 52 and by means of the nut 60 so that the valve may be rotated in its casing. The edge of the head or cap 59 is provided with a plurality of notches 61 suitably spaced as hereinafter described, and which are adapted to be engaged by a lug 62 mounted upon the outer end of a spring 63 secured to the upper surface of the valve casing by means of which the valve may be locked in either one of its several positions, as hereinafter described.

The valve 58 is provided with a central opening 64 and with two diametrically-opposite openings 65-66 leading therefrom to the outer surface of the valve. The valve is also provided with another opening 67 leading from its central opening 64 to its outer surface radially arranged and midway between the openings 65 and 66,—that is, in such a position, for example, that when the opening 65 registers with the opening 55 the opening 67 will register with the opening 54, as shown in Fig. 6; when the opening 66 is opposite the opening 55, the opening 67 will register with the opening 53, as shown in Fig. 8; and when the openings 65 and 66 are in register respectively with the openings 54-53, the opening 67 will come against the closed portion of the casing, as shown in Fig. 7. The surface of the valve 58 is also provided with a recess 68 adapted, as shown in Figs. 6 and 8, to connect openings 53 and 56 or 54 and 57.

69 indicates a pipe which at one end is screwed to the casing 52 in register with the opening 53 and at the other end leads into the inner end of the cylinder 31.

70 indicates a pipe which is screwed to the casing 52 in register with the opening 54 and connects at its other end with the other or outer end of the cylinder 31.

The rotary valve 58 is provided with a head 71 by means of which the valve may be rotated.

The normal position of the parts is shown in Fig. 7, in which position it will be obvious that the compressed air passing through the pipe 42 into the central boring 46 and into the pipes 51 will be closed against passing into the cylinder 31 by the valve. At the same time it will be clear that the pipes 69 and 70 will communicate with each other through passages 53, 54, 65 and 66, so as to permit the free movement of the piston 30 back and forth in the cylinder when the screw 21 is operated as above described to adjust the plate clamps to different cylinder widths. For instance, if the piston 30 moves

inward to the right in Fig. 3, the air forced ahead of it will pass out through pipe 69, through openings 53, 66, 65 and 54 into the pipe 70 and thence into the other end of the cylinder, a contrary movement producing a contrary passage of the air.

When it is desired to move the yoke 15 in order to simultaneously move the plate clamps inward into engagement with the edge of the plate, the valve is turned from the position shown in Fig. 7 to the right into the position shown in Fig. 6. The compressed air thereby immediately enters from the pipe 51 into the opening 65 which is brought into registry with the opening 55 by this position of the valve, out through the opening 67 and opening 54 into the pipe 70, from which it passes into the outer end of the cylinder 31, forcing the piston inward and moving the yoke inward to simultaneously clamp the plate clamps upon the plate. The air ahead of the piston is forced out through the pipe 69, opening 53, into the recess 68 in the valve 58 and out into the open air through the opening 56 in the casing 52. As soon as the clamps have been thus moved simultaneously and the yoke is locked as above described so as to lock the plate clamps upon the plate, the valve may be turned back into the position shown in Fig. 7, the yoke being prevented from return and the clamps being held in engagement with the plate by the bellcrank lever 38 above described.

When it is desired to free the clamps from the plate so as to remove the plate, the valve is turned into the position shown in Fig. 8, in which case, suitable openings being brought into registry, as shown in Fig. 8, compressed air is forced through the pipe 51, opening 66 and opening 53 into the pipe 69 behind the piston, moving it in the opposite direction, the air ahead of the piston being forced out through the pipe 70, opening 54 in the casing, recess 68, and opening 57 in the casing.

By means of the lug 62 and the spring 63, coöperating with suitably arranged notches 61, the valve may be removably locked in any one of the three positions.

In Fig. 10, showing a modification, three cylinders, instead of one cylinder, are shown, each operating a separate plate clamp but operated simultaneously through the medium of the valve. In this modification as shown, 72 indicates three cylinders, each mounted within the plate cylinder, each like the cylinder 31, and each containing a separate piston and piston rod like the piston 30 and piston rod 31 shown in Fig. 3 and hereinbefore described. In this case, no yoke 15 is provided, but three hangers 73 are provided each slidingly mounted in a suitable groove in the cylinder and like the hangers 16. In each of these hangers 16 is

carried a plate clamp 74 which is mounted therein in the same manner as the plate clamp 20 with relation to the hanger 16 as above described. 75 indicates screws each journaled in the end and body of the cylinder and longitudinally movable therein in the same manner as the screws 21 hereinbefore described, and each screw-threaded into its hanger 73 in the same manner as the screw 21 in the hanger 16, the clamps 74 being loosely mounted on the said screws in the same manner as the clamp 20. 52 indicates the valve provided with the exterior head 59 and turn-head 71 like the valve hereinabove described and connected by pipes 51 to the opening 50 as above described. 76—77 indicate pipes which are connected with the valve in the same manner as the pipes 69 and 70 but which open respectively into pipes 78 and 79. The pipes 78 are connected by suitable pipes, as 80, with the front ends of the cylinders 72, and the pipes 79 by suitable pipes, as 81, with the rear or inner ends of the cylinders 72, in the same manner as the pipes 69 and 70. The valve as has been said is precisely like the valve above described, having exactly the same openings and connections, and operating in exactly the same manner. It will be obvious by the above description of the modification that by the turning of the screws each of the plate clamps may be independently and separately adjusted upon the cylinder in order to accommodate it to different plate widths, the pistons moving in the several cylinders in the same manner as above described in describing the preferred form of device, the connections with and openings in the valve permitting the passage of the air as above described. When the plate clamps are adjusted for any given width of plate and it is desired to fasten the plate upon the cylinder, the movement of the valve in the same manner as above described permits air simultaneously to enter all three of the cylinders, and the plate clamps are simultaneously moved into engagement with the edge of the plate. Turning the valve into the piston shown in Fig. 8 causes the simultaneous movement of the pistons in the various cylinders in the opposite directions, and the simultaneous release of the clamps from the edges of the plates.

What I claim as my invention and desire to secure by Letters Patent is,—

1. The combination with a plate cylinder, and plates carried thereby, of plate clamps mounted on said cylinder, and pneumatically-operated mechanism adapted to move said clamps into engagement with the edge of the plate.

2. The combination with a plate cylinder, and plates carried thereby, of plate clamps mounted on said cylinder and movable longitudinally thereof, and pneumatically-op-

erated mechanism adapted to move said clamps on said cylinder into engagement with the edge of the plate and to move said clamps away from said plate.

3. The combination with a plate cylinder, and plates carried thereby, of plate clamps mounted on said cylinder and movable longitudinally thereof, means for separately and independently adjusting said plate clamps on the cylinder, and pneumatically-operated mechanism adapted to simultaneously move said clamps on said cylinder into engagement with the edge of the plate.

4. The combination with a plate cylinder, and plates carried thereby, of plate clamps mounted on said cylinder and movable longitudinally thereof, means for separately and independently adjusting said plate clamps on the cylinder, pneumatically-operated mechanism adapted to simultaneously move said clamps on said cylinder into engagement with the edge of the plate, and means adapted to automatically lock said clamps in engagement with the edge of said plate.

5. The combination with a plate cylinder adapted to receive a stereotype plate, of a plate clamp mounted on said cylinder and movable longitudinally thereon, a screw having a movement longitudinally of said cylinder engaging said plate clamp and adapted by its rotation to move the same longitudinally of the cylinder, an air cylinder mounted in said plate cylinder and provided with a piston and piston rod, connections between said piston rod and said clamp, and pneumatic mechanism adapted to operate the piston in said cylinder.

6. The combination with a plate cylinder adapted to contain stereotype plates, plate clamps carried by said plate cylinder and movable longitudinally thereof, and means for separately adjusting said plate clamps on said plate cylinder, of a yoke carried on said plate cylinder and movable longitudinally thereon, connections between said yoke and said plate clamps adapted to move said plate clamps longitudinally of said plate cylinder with said yoke, and pneumatically-operated mechanism adapted to move said yoke longitudinally of said plate cylinder.

7. The combination with a plate cylinder adapted to receive stereotype plates, of independently adjustable plate clamps mounted on said plate cylinder and movable longitudinally thereon, an air-cylinder mounted on said plate cylinder, a piston therein, connections between said piston and said plate clamps adapted by the movement of said piston to simultaneously move said plate clamps longitudinally of the cylinder, and pneumatic mechanism adapted to move said piston in said air-cylinder.

8. The combination with a plate cylinder adapted to contain stereotype plates, plate

clamps carried by said plate cylinder and movable longitudinally thereof and means for separately adjusting said plate clamps on said plate cylinder, of a yoke carried on
5 said plate cylinder and movable longitudinally thereon, connections between said yoke and said plate clamps adapted to move said plate clamps longitudinally of said plate cylinder with said yoke, pneumatically-operated mechanism adapted to move said yoke 10 longitudinally of said plate cylinder, and mechanism adapted to automatically lock said plate clamps against said stereotype plates.

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