No. 629,932. Patented Aug. 1, 1899.

W. SPALCKHAVER.

SHEET HOLDING AND STRAINING DEVICE.

(Application filed Dec. 10, 1898.)

(No Model.)

Fig. 2

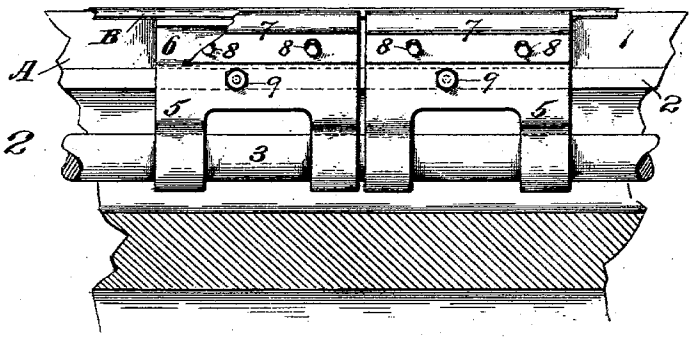


Fig. 1.

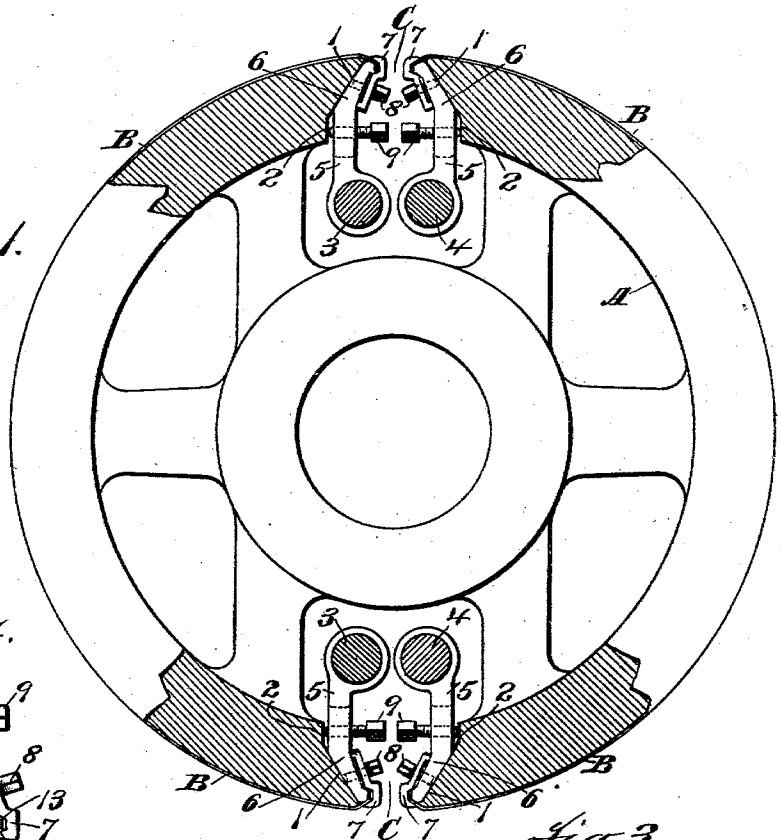


Fig. 4.

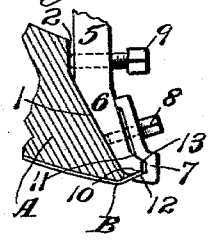
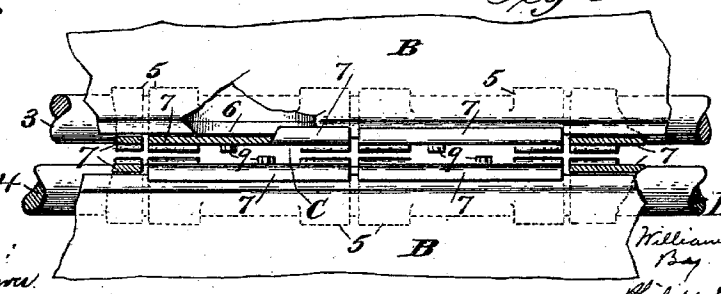


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SHEET HOLDING AND STRAINING DEVICE.

SPECIFICATION forming part of Letters Patent No. 629,932, dated August 1, 1899.

Application filed December 10, 1898. Serial No. 698,863. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SPALCKHAVER, a citizen of the United States, residing at New York city, county of Kings, and State of New York, have invented certain new and useful Improvements in Sheet Holding and Straining Devices, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in devices for straining to their seats and holding in position sheets of flexible material, and is more particularly directed toward improvements in those devices which are intended for use in connection with aluminium, zinc, and other metallic printing-plates.

Aluminium, zinc, and other metallic surfaces are usually mounted on cylinders, and it is desirable to cover as large a portion of the cylinders as possible with printing-plates. It is desirable, therefore, that the gaps in which the devices for straining the plates to their seats and holding them in position are located shall be very small in order that the cylinders may present the greatest possible amount of plate-supporting surface.

It is the object of this invention to so construct the printing-cylinder and its coöperating plate holding and straining devices as to permit very narrow gaps to be left in the cylinder and at the same time to allow of sufficient room to permit the straining devices to be manipulated not only to clamp the plates, but also to strain them to their seats.

The invention consists in certain parts, improvements, and combinations, as will be hereinafter described, and particularly pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like letters and numerals of reference indicate the same parts, Figure 1 is an end elevation of a cylinder constructed in accordance with the invention and provided with the improved plate-holding device, certain parts of the cylinder being shown in section. Fig. 2 is a detail sectional view, the plane of section passing between the plate-holding devices shown in Fig. 1. Fig. 3 is a plan view showing the plate-holding devices in position, portions of said devices being shown in section; and Fig. 4 is a detail illustrating the construction of the plate-clamping jaws.

In the drawings, A indicates a cylinder constructed to carry two metallic printing-plates B. The cylinder may of course be constructed to carry more than two plates, but two are sufficient to illustrate the invention. The cylinder A is provided with two gaps or openings C, in which the plate holding and straining devices are located. Each gap or opening preferably has its two sides beveled or undercut to form inclined faces 1, and these inclined faces preferably terminate in straight faces 2. Only one side of the opening need be formed to provide these faces.

Located beneath each of the openings are a pair of rods 3 4, which are suitably supported in the cylinder. Pivoted on these rods are a series of jaw-plates, these plates preferably consisting of a straight portion 5 and an inclined portion 6. The inclined portion of the jaw-plates is arranged so as to be substantially parallel to the undercut face of the opening to which it is adjacent when the jaw-plate rests against said undercut face, and the straight portion is substantially parallel to the straight face of the opening. The upper or outer edges of the jaw-plates are also formed to provide jaw-faces 10, these jaw-faces being preferably, though not necessarily, slightly inclined. The jaw-plates are further provided with inclines 11, and it will be noted that these inclines and the jaw-faces 10 form two sides of a salient angle. The straight and inclined portions are preferably formed by arranging the two parts of the plate at an angle to each other.

Coöperating with the jaw-plates before referred to are jaw-plates 7. These jaw-plates 7 are preferably carried on the inclined parts 6 of the other jaws, being secured thereto by means of bolts 8, and are provided with jaw-faces 12, preferably, though not necessarily, slightly inclined, which coöperate with the jaw-faces 10, and inclines 13, which coöperate with the inclines 11. It will be noted that the faces 12 and inclines 13 form two sides of a reëntrant angle. The straight portions 5 of the jaws first referred to have tapped openings therein, and located in these openings are bolts

9, these bolts bearing against the straight faces 2 of the openings before referred to.

The operation of the device is obvious. The edges of the plate or other sheet of material which it is desired to hold and strain are inserted between the jaws of each pair of jaw-plates, and the plates 7 are forced inward by the bolts 8. As the jaw-plates 7 move inward under the action of the bolts 8 the inclines 11 and 13 cause the plates to move downward, the inclines having a wedge or cam action, and the jaw-face 12 is thus forced downward toward the jaw-face 10, clamping the plate firmly and securely between the jaws. Each set of jaws is then adjusted by turning the bolts 9, which cause the jaws to turn about the rods 3 4 and draw the plate to its seat.

By making the openings in the cylinder with beveled or inclined sides and constructing the jaw-plates with an angle of inclination which corresponds to that of the inclined sides it will be seen that the opening in which the straining devices are located can be made very narrow at the outer circumference of the cylinder, thus leaving a large amount of plate-supporting surface, and at the same time sufficient space is afforded in the opening itself to accommodate the holding and straining jaws and the means for manipulating them. By arranging the bolts 9 on the opposite sets of jaws in a slightly-staggered position, as shown in Fig. 3, space may be still further economized, and yet the bolts can be readily reached and adjusted by a suitable wrench or spanner. It will be furthermore noted that the movement of the said jaw-plates on the rods tends to draw the edge of the plate down into the opening and across the sharp edge formed by the beveled or undercut side of the opening in the cylinder, thus enabling the holding devices to more securely retain the plate in position.

The cylinder is shown as provided with two openings and with sets of holding devices in each opening, so that the plate is held at each end by the same devices. It is obvious, however, that one of these sets of devices might be omitted and the plates held on the cylinder at one edge in any other suitable manner.

Various modifications of the device are possible. For instance, the straight faces of the openings might be omitted, the inclined faces being continued clear across the opening. So, too, instead of constructing the jaws of the straight portion 5 and the inclined portion 6 they might have a single inclined part lying against the inclined face of the opening, in which case, of course, the rods 3 4 will be located somewhat farther apart than they are illustrated in the drawings. The inclines, which constitute the jaw-faces and the means for forcing the jaw-faces together, may also be omitted. These modifications are, however, obvious and are not therefore illustrated.

While also the invention is particularly adapted for use for holding and straining metallic printing-plates to cylindrical supporting-surfaces, it is also adapted for use with supports which are not cylindrical—as, for instance, where metallic plates are to be mounted on flat beds or for use in connection with sheets of material other than metallic printing-plates. The invention is not therefore to be limited to the particular use described.

Various modifications of the device other than those suggested are possible and will suggest themselves to skilled mechanics. It is to be understood, therefore, that the invention is not limited to the precise construction shown and described, but that it covers all modifications which fall within its spirit and scope as defined by the claims hereunto appended.

What I claim is—

1. In a holding and straining device the combination with a cylinder having an opening therein forming a gap, one side of the opening being beveled or undercut, of a sheet holding and straining device located in the opening, and means for adjusting it toward and from the undercut face of the opening to draw the sheet into the opening and over the sharp edge formed by the undercut, substantially as described.

2. In a holding and straining device, the combination with a cylinder having an opening therein forming a gap, one side of the opening being beveled or undercut, of a pivoted sheet holding and straining device located therein, and means for adjusting said plate-holding device about its center whereby the plate or sheet of metal held thereby will be drawn over the sharp edge of the opening formed by the undercut and downwardly into the gap, substantially as described.

3. In a holding and straining device, the combination with a cylinder having an opening therein forming a gap, one side of the opening being beveled or undercut, of a rod carried by the cylinder, a series of plate-holding devices pivoted on the rod, said devices having faces which are substantially parallel to the beveled or undercut face of the opening, and means for independently adjusting each of the series of devices about the rod and away from the face of the opening to draw the edge of the sheet over the sharp edge of the cylinder formed by the undercut and downward into the opening, substantially as described.

4. In a holding and straining device, the combination with a cylinder having an opening therein forming a gap, one side of the opening being beveled or undercut, of a pivoted plate holding and straining device pivoted on the center which lies between the circumference of the cylinder and its axis having a face parallel to the beveled face of the opening, and means for adjusting said device about its center whereby the plate or sheet of metal held thereby will be drawn over the edge of the opening and downwardly into the gap, substantially as described.

5. In a holding and straining device the combination with a cylinder having an opening therein forming a gap for the plate-holding devices, one side of the opening being beveled or undercut, of a holding device therein including a pair of jaw-plates which are arranged substantially parallel to the undercut face of the opening, and means for adjusting the jaws toward and away from said face, substantially as described.

6. In a holding and straining device, the combination with a cylinder having an opening therein forming a gap, one side of the opening being beveled or undercut, of a holding device located therein, said device including pivoted jaw-plates which are arranged substantially parallel to the undercut face of the opening, and means for adjusting the jaw-plates around their pivot and away from the undercut face of the opening, substantially as described.

7. In a holding and straining device, the combination with a cylinder having an opening therein provided with beveled or undercut faces, of rods supported in the cylinder, a series of pairs of jaw-plates pivoted on the rods each series of pairs being substantially parallel to the undercut face of the opening to which they are adjacent, and means for adjusting the jaws around their pivots, substantially as described.

8. In a holding and straining device, the combination with a cylinder having an opening therein provided with beveled or undercut faces and straight faces, of a pair of rods supported in the cylinder beneath the openings, a series of jaw-plates supported on the rods, said jaw-plates consisting of straight and inclined parts, the inclined parts being substantially parallel to the undercut faces and the straight parts being substantially parallel to the straight faces of the openings to which they are adjacent, coöperating jaw-plates carried by the inclined parts of the first-named jaw-plates, means for forcing the jaw-plates together to grip the material to be held between them, and means for independently adjusting each pair of jaw-plates about the rods, substantially as described.

9. In a holding and straining device, the combination with a cylinder having an opening therein forming a gap for the plate-holding device, said opening having a beveled or undercut face and a straight face, a rod supported beneath the opening, a jaw-plate mounted on the rod, said jaw-plate having a part which is substantially parallel to the straight face of the opening and a part which is substantially parallel to the inclined face, a second jaw carried by the first-named jaw, and an adjusting-screw tapped through the straight portion of the arm and bearing against the straight face of the opening, substantially as described.

10. The combination with a cylinder having an opening therein forming a gap, the sides of said opening having inclined and straight faces, a pair of rods located beneath the opening, a series of jaw-plates mounted on the rods, said jaw-plates having straight parts which are substantially parallel to the straight face to which they are adjacent and inclined parts substantially parallel to the inclined faces to which they are adjacent, a series of set-screws tapped through the straight parts and bearing against the straight faces of the opening, and a coöperating series of jaw-plates carried by the first-named jaw-plates, substantially as described.

11. In a holding and straining device, the combination with a pair of sheet-supporting surfaces having a narrow opening between them, of straining and holding devices located on each side of the opening, and devices for forcing the straining devices away from the edges of the opening, said devices being staggered with respect to each other, substantially as described.

12. In a holding and straining device, the combination with a cylinder provided with a pair of sheet-supporting surfaces having an opening between them, the edges of the opening being undercut, a pair of straining-jaws located on each side of the opening, means for causing each pair of jaws to grip the plate, and bolts acting to force each pair of jaws away from the undercut edges, said bolts being staggered with relation to each other, substantially as described.

13. In a holding and straining device, the combination with a sheet-support, of a jaw-plate having a jaw-face and provided with an incline, said face and incline forming two sides of a salient angle the base of which is adjacent to the sheet-support, a coöperating jaw-plate having a jaw-face and an incline, said jaw-face and incline forming two sides of a reëntrant angle, and means for forcing the jaw-plates together with the salient angle of the one entering the reëntrant angle of the other, substantially as described.

14. In a holding and straining device, the combination with a sheet-support, of a jaw-plate having a jaw-face 10 and an incline 11, said face and incline forming two sides of a salient angle which has its base adjacent to the sheet-support, a second jaw-plate having a jaw-face 12 and an incline 13, and a bolt forcing the two jaw-plates toward each other, the inclines acting to draw the jaws 10 and 12 together, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM SPALCKHAVER.

Witnesses:
F. W. H. CRANE,
E. L. SPEIR.