No. 629,916. Patented Aug. 1, 1899.

T. M. NORTH.

SHEET HOLDING AND STRAINING DEVICE.

(Application filed Dec. 7, 1898.)

(No Model.)

Fig. 1.

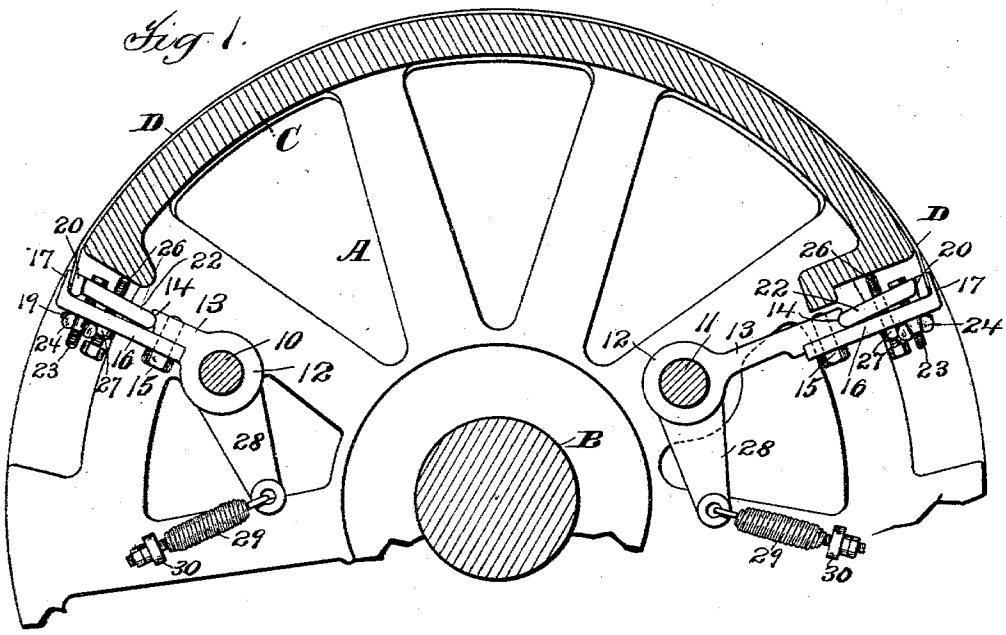


Fig. 3.

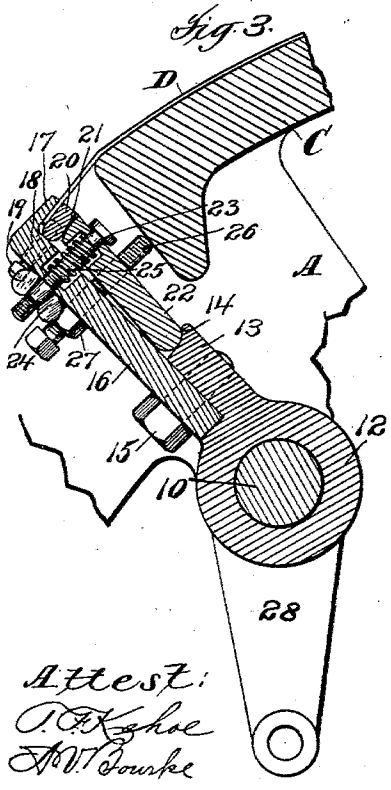
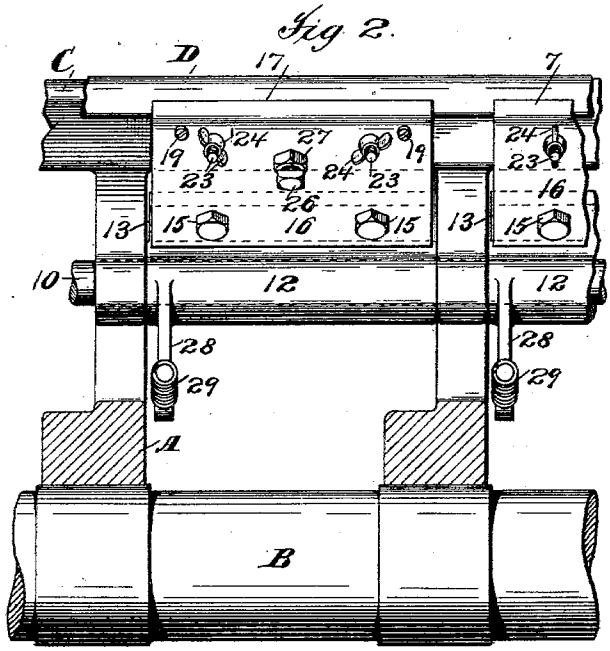


Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS M. NORTH, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

SHEET HOLDING AND STRAINING DEVICE.

SPECIFICATION forming part of Letters Patent No. 629,916, dated August 1, 1899.

Application filed December 7, 1898. Serial No. 698,503. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. NORTH, a subject of the Queen of Great Britain and Ireland, 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 the invention is more particularly adapted for use with sheets of aluminium, zinc, and other similar flexible sheets which are to be used as or in connection with printing-surfaces.

The objects of the invention are to produce a straining and holding device for sheets of aluminium, zinc, and other substances which is cheap and simple in construction, in which a pair of plate-holding jaws or a series of said jaws may be easily and quickly adjusted to securely grip and hold the sheet, in which each one of a series of said jaws is independently adjustable to produce differing degrees of straining action along the edges of the plate, so as to cause all parts of the sheet to be evenly and smoothly on its seat, and in which means are provided to keep the straining and holding device snugly against the edge of the sheet-supporting surface when the device is not in use in order to avoid rattling.

The invention consists in certain parts, improvements, and combinations, which will be hereinafter fully described and then particularly set forth in the claims hereunto appended.

In the accompanying drawings, Figure 1 represents a vertical section through a portion of a cylinder having the improved sheet straining and holding devices attached thereto, said devices being shown in elevation. Fig. 2 is a detail showing one of a series of sheet straining and holding devices in front elevation and a portion of an adjacent device. Fig. 3 is a sectional detail view taken through one of the sheet straining and holding devices.

In the drawings, A indicates a sheet-carrier or plate-support, which in this instance may be a cylinder and the printing member of a printing-couple. The cylinder is mounted on a cylinder-shaft B and is provided with a plate-supporting surface C. The cylinder may of course and usually will be provided with a plurality of such surfaces; but one is sufficient to illustrate the application of the invention.

D indicates an aluminium, zinc, or other flexible printing-plate resting upon the supporting-surface C, the plate being strained and held thereon by the devices which will now be described.

The form or plate carrying cylinder A is provided with two rods 10 and 11, which preferably extend through it from side to side. Mounted on these rods are a series of sleeves 12, which are provided with outwardly-projecting short arms or projections 13, said arms preferably having their upper surfaces curved, as shown at 14. Secured to the projecting arms 13 by means of bolts 15 or in any other suitable manner are a series of jaw-plates 16, which are formed to provide overhanging plate-holding jaws 17. The jaws which coöperate with the jaws 17 may be formed and supported in various ways. Preferably, however, the jaw-plates 16 are provided near their upper ends with perforations 18, (see dotted lines in Fig. 3,) and through these perforations pass pins or bolts 19. The inner ends of said pins or bolts are secured to jaws 20, which jaws coöperate with the jaws 17 to hold the plate. It will be noticed that the perforations 18 are larger than the pins or bolts 19, so that the jaw 20 is a loosely-mounted jaw, the size of the perforations being such as to allow the necessary movement of this jaw away from the jaw 17 in order to permit the insertion of the edge of the plate between the jaws and toward the jaw 17 in order that the plate may be clamped between the jaws.

Various devices may be used for forcing the under jaw 20 against the coöperating jaw in order to cause the plate to be properly gripped between the jaws. Preferably, however, the under side of the jaw 20 is slightly curved, as shown at 21 in Fig. 3, and between this curved under face and the curved face 14 of

the arm 13 is located a rocking block 22, which preferably has its edges curved or rounded, as shown. This block is preferably secured to the plates 16 by means of a bolt 23, provided with a wing-nut 24. It is obvious that by turning the wing-nut 24 in the proper direction the block 22 will be forced toward the jaw-plate 16, and the block is of the proper width so that by this movement the jaw will be forced up against the jaw 17, the block having a kind of wedge or toggle action. It will also be noted that the jaw 20 moves upward in substantially a right line under the action of the rocking block. There is no tendency, therefore, for the jaw to slip on the plate as the clamping is effected.

In order to force the rocking block 22 away from the plate 16, so as to permit the jaws 20 and 17 to separate and the plate to be disengaged therefrom, springs 25 are preferably provided, though other means might be used, if desired. These springs may be arranged in any desired manner. Preferably, however, they will surround the bolt 23, the plate 16 and the rocking block 22 being provided with recesses to receive the ends of the spring.

After the jaws have been caused to grip the plate it is necessary that they be forced away from the edge of the plate-supporting surface in order to strain the plate to its seat and cause it to lie evenly and smoothly on the surface of the cylinder. This result may be effected in several ways. A convenient means of effecting this result is, however, that shown. A screw 26, provided with a lock-nut 27, engages a threaded hole in the plate 16, and passing through a perforation in the rocking block 22 bears against the edge of the plate-supporting surface C.

It may sometimes happen, usually where the cylinder has a plurality of plate-supporting surfaces, that all the straining and holding devices will not be in use, and in order to prevent pounding and rattling means are preferably provided to hold the jaws against the edge of the plate-supporting surface when they are not being utilized for holding a plate. In order to effect this result, the sleeves 12 are preferably provided with arms 28, to which is connected a spring 29, the other end of the springs being secured in eyes 30, which are fast on the cylinder. The springs 29 act in opposition to the bolts 26 and will act to hold the device snugly against the edge or shoulder of the plate-supporting portion of the cylinder, and thus prevent any rattling in case the cylinder is revolved when some or all of the holding devices are not in use.

The plate-support might be constructed to employ only a single set of jaws at each end, in which case the rods 10 and 11 would be provided with a long sleeve 12, the jaws 20 and 17 being made long enough to securely hold the edges of the plate. The preferable construction, however, is that shown, in which the rods 10 and 11 each carries a series of sleeves 12, since each of the series of gripping-jaws is thus made independently adjustable. If, therefore, certain portions of the plate require greater straining action than other portions, this result can be effected by adjusting the particular set of jaws which acts upon that portion of the plate independently of the other jaws. While, too, the plate is shown as held at each end by sets of jaws of the peculiar construction hereinbefore described, it is obvious that only one set of such jaws may be used, the plate being held at the other end in any desired manner.

While the construction described is particularly effective as a plate-holding device, it is to be understood that it is capable of use in other relations and for other purposes—such, for instance, as holding the blankets or packing of impression-cylinders in position. The invention is not, therefore, to be limited in its application to the particular uses described. So, also, while the sheet-support is herein shown and described as a cylinder, it is obvious that the invention is equally applicable for use with sheet-supports other than cylinders—as, for instance, flat beds. It is also apparent that many changes may be made in the construction without departing from the spirit and scope of the invention, and such changes will suggest themselves to skilled mechanics. It will be understood, therefore, that the invention is not to be limited to the particular form of devices described in the foregoing specification and illustrated in the accompanying drawings.

What I claim is—

1. In a holding and straining device, the combination with a stationary upper jaw, of a movable lower jaw, and means independent of the jaws and acting on the under jaw for forcing it against the upper jaw, whereby said jaw is given a substantially right-line movement as the clamping action is effected, substantially as described..

2. In a holding and straining device, the combination with a sheet-support, of a stationary upper jaw, a movable lower jaw, means independent of the jaws and acting on the under jaw for forcing it against the upper jaw, whereby said jaw is given a substantially right-line movement as the clamping action is effected, and means for forcing the two jaws away from the sheet-support, substantially as described.

3. In a holding and straining device, the combination with a stationary jaw, of a movable jaw, and means independent of the jaws for forcing them together, said means having a wedge or toggle action whereby the movable jaw is forced against the stationary jaw with a substantially right-line movement, substantially as described.

4. In a holding and straining device, the combination with a sheet-support, of a stationary jaw, a movable jaw, means independent of the jaws for forcing them together, said means having a wedge or toggle action whereby the movable jaw is forced against the sta-

tionary jaw with a substantially right-line movement, and means for forcing the jaws away from the sheet-support, substantially as described.

5. In a holding and straining device, the combination with an arm having a shoulder, of a stationary jaw-plate carried by the arm, a loosely-mounted jaw, and means independent of the jaws acting against the loosely-mounted jaw and the shoulder for forcing the jaws together, substantially as described.

6. In a holding and straining device, the combination with an arm having a shoulder, of a jaw-plate having an overhanging jaw, a loosely-mounted jaw, and a rocking block acting between the shoulder and the loosely-mounted jaw and serving to force the jaws together, substantially as described.

7. In a holding and straining device, the combination with an arm having a curved shoulder, of a rocking block having a rounded edge resting on the shoulder, a jaw-plate having an overhanging jaw, a loosely-mounted jaw between the block and the overhanging jaw, and means for rocking the block to force the said jaw against the overhanging jaw, substantially as described.

8. In a holding and straining device, the combination with an arm having a curved shoulder, of a rocking block curved on both edges, a jaw-plate having an overhanging jaw, a loosely-mounted jaw between the block and the overhanging jaw and having its lower face curved, and means for rocking the block to force the two jaws together, substantially as described.

9. In a holding and straining device, the combination with an arm having a shoulder, of a jaw-plate having an overhanging jaw, a rocking block, a loosely-mounted jaw between the block and the overhanging jaw, said jaw having a curved under face, and means for rocking the block to force the jaws together, substantially as described.

10. In a holding and straining device, the combination with an arm having a shoulder and carrying a jaw-plate having an overhanging jaw, of a loosely-mounted jaw carried by the jaw-plate, a rocking block also carried by the plate, and means for rocking the block to force the loosely-mounted jaw against the overhanging jaw, substantially as described.

11. In a holding and straining device, the combination with an arm having a shoulder, of a jaw-plate having an overhanging jaw secured thereto, a jaw, a pin connected thereto and extending through an aperture in the overhanging jaw, a rocking block resting on the shoulder and connected to the overhanging jaw by a bolt and nut, whereby the block may be rocked to force the jaws together, substantially as described.

12. In a holding and straining device, the combination with an arm having a curved shoulder, of a jaw-plate having an overhanging jaw secured thereto, a jaw having a curved under face, a pin connected thereto and extending through an aperture in the overhanging jaw, a rocking block having a curved edge resting on the curved shoulder and connected to the overhanging jaw by a bolt and nut, whereby the block may be rocked to force the jaws together, substantially as described.

13. In a holding and straining device, the combination with an arm having a shoulder, of a jaw-plate having an overhanging jaw secured thereto, a jaw, a pin connected thereto and extending through an aperture in the jaw-plate, a rocking block resting on the shoulder and connected to the overhanging jaw by a bolt and nut, whereby the block may be rocked to force the jaws together, and a spring to force the jaws apart, substantially as described.

14. In a holding and straining device, the combination with an arm having a curved shoulder, of a jaw-plate having an overhanging jaw secured thereto, a jaw having a curved under face, a pin connected thereto and extending through an aperture in the jaw-plate, a rocking block curved on both edges resting on the curved shoulder and connected to the overhanging jaw by a bolt and nut, whereby the block may be rocked to force the jaws together, and a spring to force the jaws apart, substantially as described.

15. In a holding and straining device, the combination with a sheet-support, of an arm, a jaw-plate carried by the arm, a jaw loosely connected to the jaw-plate, a rocking block intermediate the jaws and the arm, means for rocking the block to force the two jaws together, and means passing through the jaw-plate and the block for forcing the arm and jaws away from the edge of the sheet-support, substantially as described.

16. In a holding and straining device, the combination with a cylinder having a sheet-supporting surface, of a rod mounted therein, a sleeve mounted on the rod, an arm extending from said sleeve, a jaw-plate carried by the arm, a loosely-mounted jaw connected to the jaw-plate, a rocking block acting between the loosely-mounted jaw and the arm, means whereby the arm and jaws are forced away from the sheet-supporting surface, and means acting in opposition to said means for forcing the arm and jaws toward said surface, substantially as described.

17. In a holding and straining device, the combination with a sheet-support, of a pair of holding-jaws mounted near the support, means for forcing the jaws away from the sheet-support, and means acting in opposition to the jaws to force them toward the sheet-support, substantially as described.

18. In a holding and straining device, the combination with a sheet-support, of a rod, a sleeve mounted on the rod, a pair of jaws carried by the sleeve, means for forcing the jaws away from the sheet-support, an arm connected to the sleeve, and a spring connected to the arm and to a part carried by the cylinder for forcing the jaws toward the plate-carrying surface, substantially as described.

19. In a holding and straining device, the combination with a sheet-support, of a series of sets of sheet-holding jaws, each set consisting of a stationary upper jaw and a movable lower jaw, means independent of the jaws for forcing the lower jaw against the upper jaw with a substantially right-line movement, and means for independently adjusting each set of jaws with respect to the sheet-support, substantially as described.

20. In a holding and straining device, the combination with a sheet-support, of a series of sets of sheet-holding jaws, each set consisting of an overhanging upper jaw and a movable lower jaw, means for forcing the lower jaw against the upper jaw, means for independently adjusting each set of jaws with respect to the sheet-support, and automatic means for forcing each set of jaws toward the sheet-support, substantially as described.

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

THOMAS M. NORTH.

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