No. 648,987. Patented May 8, 1900.

S. C. NOTT.

DOUBLE ACTING COMPRESSING DEVICE.

(Application filed Feb. 15, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

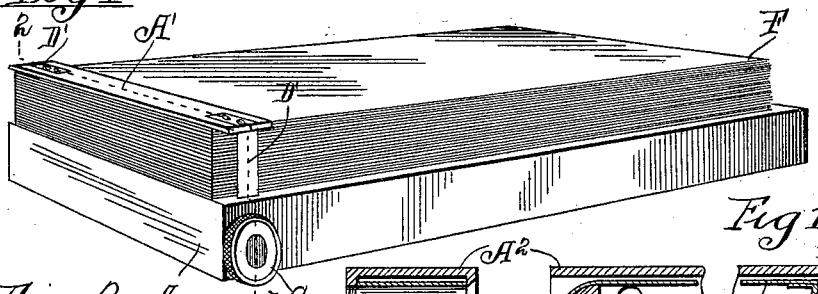


Fig 11

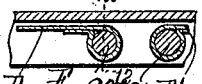
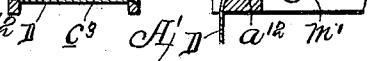


Fig 2

Fig 12



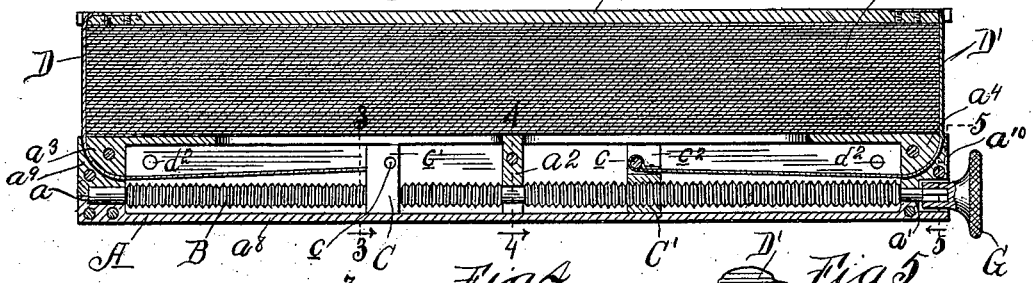


Fig 3

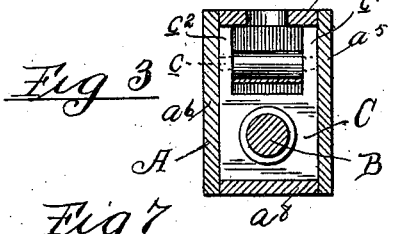


Fig 4

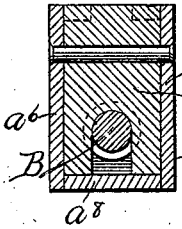


Fig 5

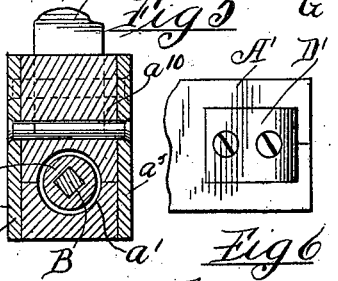


Fig 7

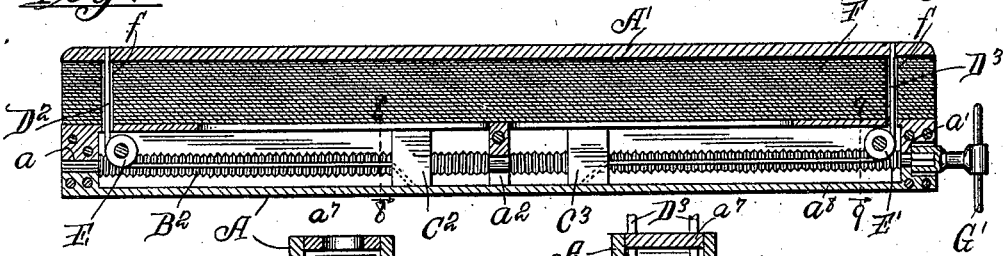


Fig 8

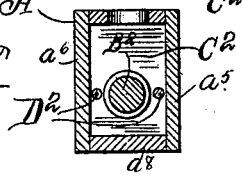


Fig 9

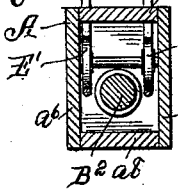


Fig 6

Witnesses:-

Carl H. Crawford

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Inventor:-

Sydney Charles Nott.

by Poole & Brown his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig 10

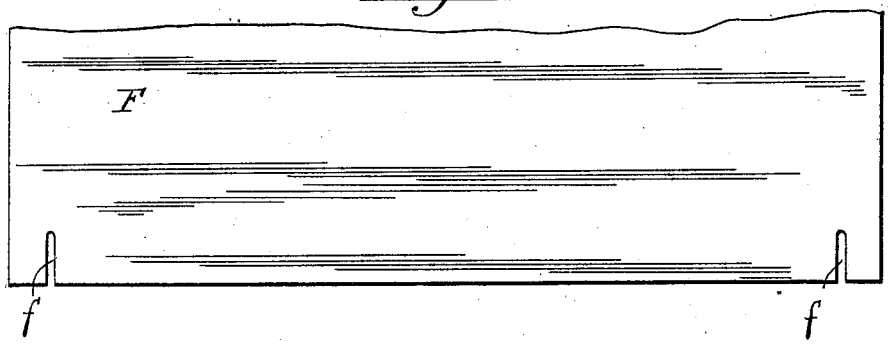


Fig 13

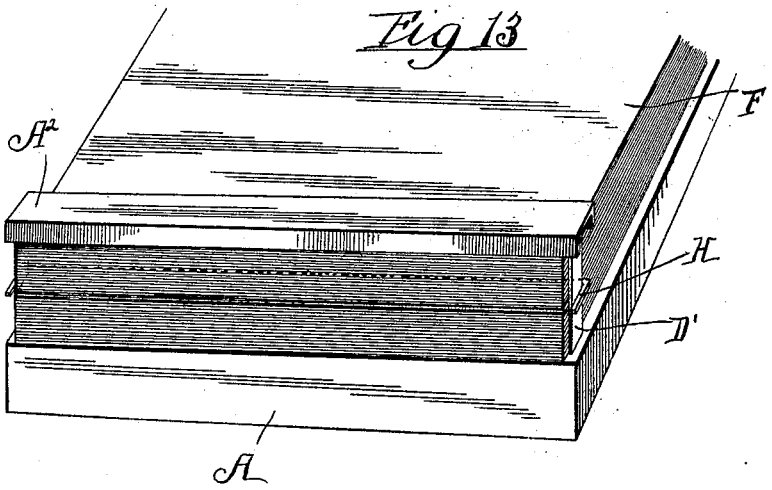
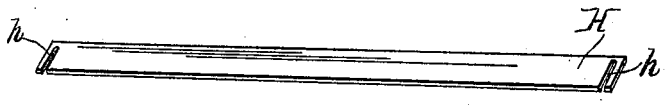


Fig 14



Witnesses
Carl A. Crawford
C. M. Hill

Inventor:-
Sydney Charles Nott
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UNITED STATES PATENT OFFICE.

SYDNEY CHARLES NOTT, OF CHICAGO, ILLINOIS.

DOUBLE-ACTING COMPRESSING DEVICE.

SPECIFICATION forming part of Letters Patent No. 648,987, dated May 8, 1900.

Application filed February 15, 1899. Serial No. 705,528. (No model.)

To all whom it may concern:

Be it known that I, SYDNEY CHARLES NOTT, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Double-Acting Compressing Devices; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved compressing device adapted to be used for the purposes usual for devices of the kind, and especially for the purpose of a temporary binder for loose sheets of paper—such as bills, invoices, and the like—or for account-books, wherein it is desired that the account may be removed from the book when completed and other new leaves substituted.

The invention embraces a device whereby the action of a right and left threaded shaft, to which are secured flexible connecting parts, also connected with the opposite ends of a movable binding-plate, is utilized to draw the said plate into binding contact with a base or any body placed between the said plate and the base.

The invention consists in the matters more fully set forth and defined in the appended claims.

In the drawings, Figure 1 is a view illustrating a device embodying my invention. Fig. 2 is a section taken on line 2 2 of Fig. 1. Fig. 3 is a section taken on line 3 3 of Fig. 2. Fig. 4 is a section taken on line 4 4 of Fig. 2. Fig. 5 is a section taken on line 5 5 of Fig. 2. Fig. 6 is a view illustrating a manner of securing one end of a flexible connecting-band to the binding-plate. Fig. 7 is a view illustrating a device embodying a modification of my invention. Fig. 8 is a section taken on line 8 8 of Fig. 7. Fig. 9 is a section taken on line 9 9 of Fig. 7. Fig. 10 illustrates marginal notches in a sheet of paper adapted to be used in the modified form of my device. Fig. 11 is a detail shown in section, partly broken, of a modification of my invention, by means of which the capacity of the same may be greatly increased. Fig. 12 is a section taken on line 12 12 of Fig. 11. Fig. 13 is a perspective rear elevation of a binder embodying my invention, illustrating a modification thereof. Fig. 14 is a perspective view of one of the details of my invention.

As shown in the drawings, A indicates a tube having end bearings a a' and a central bearing a^2. A right and left threaded screw-shaft B is journaled in the said bearings and is provided with an angular end, which projects through the bearing a' and is adapted to be engaged by a key G. C C′ are carriages movably mounted on opposite ends of the said screw-shaft and provided with internal screw-threads complementary thereto, whereby the said carriages may be oppositely driven by the rotation of the shaft. The said carriages preferably fit closely within the said tube A and slide between the walls thereof, whereby all lateral movement of the said carriages is prevented, while a free longitudinal movement is permitted. A′ is a movable binding-plate, and D D′ are flexible bands or other suitable connections, preferably of metal, secured at one end to said carriages and at their other end to the extremities of the said binding-plate. Convex bearing-surfaces a^3 a^4, located at the ends of the said tube and over which the flexible bands D D′ pass, are adapted to cause the strain of the carriages upon the said bands to be converted into a direct downward pull upon the said movable binding-plate.

The tube A of my improved binding device may be of any desired construction or form. As herein shown, the cross-section thereof is rectangular and the length thereof is approximately equal to the width of the book or material to be compressed. As herein shown, it is constructed of separate side, top, and bottom plates a^5 a^6 a^7 a^8, respectively, joined by rivets or other suitable means. Obviously, however, the said parts may be integral, and I do not wish to be restricted to a construction wherein the parts of the tube are separate plates. If constructed of separate plates, the bottom plate a^8 is provided at its ends with integral upwardly-projecting parts adapted to form the lower half of the bearings in which the ends of the said shaft B are journaled. Rigidly secured to the side plates are end pieces a^9 a^{10}, the under sides of which form the top portion or upper half of the bearing for the said shaft. The said end pieces

have inwardly and downwardly inclined concave inner surfaces. The top plate is provided at its extremities with integral downwardly and inwardly inclined cylindrical convex ends a^3 a^4, complemental to the concave surfaces of the parts a^9 a^{10}, heretofore described, fitting into the same and providing transverse passages in the ends of the tube, through which pass the flexible bands heretofore mentioned. The central bearing-block a^2 is situated transversely in the said tube and is provided with a cylindrical aperture longitudinal of the tube and is adapted thereby to form a bearing for the said screw-threaded shaft B, which is provided with a central journal for that purpose. The said shaft is preferably located near the bottom of the tube and is provided with a right-hand thread on one side of the central bearing and with a left-hand thread on the other side of said bearing, and at one end is provided with an angular part, which extends outwardly through an end bearing and is adapted to be engaged by a key G, as shown in Fig. 2. The carriages C C′ are internally screw-threaded complementary to the screw-threads upon the said shaft and are adapted to be moved by the rotation of the said shaft oppositely to each other. They are also provided at the sides adjacent to the sides of the tube with upwardly-projecting integral arms c' c^2, which extend to the top plate, and cylindrical pins c c in each carriage pass through the said arms, and to each of said pins is secured the looped end of one of the flexible bands D or D′. The said bands D D′ extend outwardly through the passage in the end of the said tube A and upwardly therefrom into engagement with the movable binding-plate A′. The manner of attaching the said bands to the said binding-plate may be any convenient method. As shown in Figs. 1, 2, and 6, the extremities of the said binding-plate are rounded off and the ends of the said bands D D′ are turned over from the opposite extremities of the said movable binding-plate and secured thereto by screws or rivets. Obviously, however, other means of attaching the same to the plate may be used without departing from the principle of my invention, and I do not desire to be restricted to the specific means described. The manner herein shown of attaching the said flexible band to the said carriages is as follows: Apertures d^2, corresponding with the apertures in the carriages in which the pins c are held, are formed in the side plates of the said tube, the screw-shaft is rotated until the apertures in the said carriages come in alinement with the apertures in the said tube, the end of the flexible band is then placed in position between the arms of the carriage, and the pin c is pushed into position in the carriage through the loop in the end of the band. The rotation of the shaft will then carry the carriages to any desired point, and it is obvious that when the carriages are moved from their position the said pins will be held in place by the side walls of the said tube. As a modification of my device flexible cables D^2 D^2 D^3 D^3 may be employed instead of the said flexible bands, in which case the said convex segments a^3 a^4 may be used, as heretofore described, or preferably rollers or grooved pulleys E E E′ E′ may be pivoted in the ends of the said tube in such manner as to receive the said cables and change the direction thereof from parallel to the said screw-shaft to a direction perpendicular thereto, as shown in Fig. 7. In the use of the said cables a cable will preferably be attached on each side of each of the said carriages C^2 C^3 at points in line with the central axis of the said shaft and on each side thereof, and the said pulleys E E E′ E′ are of such diameter that the said cables draw on each side of the shaft parallel to the central axis, so that the said carriage draws true with the thread upon the shaft. The shaft B^2 is provided with end and central bearings similar to those heretofore described and has also an angular end extending through one of the end bearings into position to be engaged by a key G′ or other suitable rotating device. Inasmuch as the use of the said cables will preferably cause the ends of the said tube to project somewhat beyond the point where the said cables emerge from the said tube, it is preferable that the paper F to be bound therein should be provided upon its rear margin with notches f f, as shown in Fig. 10. This provides a means whereby the paper may be evenly adjusted within the said binder by releasing the paper from the binding action of the movable binding-plate and by pushing the paper rearwardly against the said cables. After the paper is in position the said binding-plate may be drawn downwardly upon the same to any required degree of tension by means of a key, (herein indicated by G′.)

As a modification of my invention I provide means for increasing the capacity of my binder, as illustrated in Figs. 11 and 12, as follows: The binding-plate A^2 is provided with integral downwardly-extending side walls, and at each end is provided with a convex upwardly and inwardly inclined transverse tension-bar a^{12}, integral with the side walls and designed to furnish a bearing-surface for the flexible bands D and D′, respectively. On each side of the center of the said binding-plate are transverse apertures, which extend through the integral side walls thereof and are adapted to receive cylindrical pins c^3 c^4, upon each of which one end of one of the said flexible bands is secured in a manner similar to that by which the other end is secured to the carriage C or C′, as heretofore described. At each end of the binding-plate, equidistant from the center and closely adjacent to the said transverse tension-bars, but between the same and the center, is an aperture similar to those heretofore described as located near the center of the plate and adapted to receive therein the pins c^3 c^4, upon

which are secured the looped ends of the bands D and D′, respectively. The said pins may be secured in the said apertures in any convenient manner; but preferably the said pins are bolts screw-threaded at one end, adapted to engage a complemental screw-thread in the side wall of the binding-plate and with a slotted head adapted to fit into the aperture of the other side, which is countersunk for that purpose, as shown in Fig. 12. The advantages of this construction are obvious, inasmuch as it provides a means for nearly doubling the capacity of my binder. It is believed that with the ends of the bands D D′ secured upon the pins c^3 c^4 when near the center of the binding-plate the device will be of sufficient capacity for all ordinary purposes; but should greater space be required it is only necessary to remove the pins to their positions near the ends of the binding-plate and secure the bands thereon, when it is found that the binder will hold nearly double the amount previously contained.

As a further improvement I provide a thin plate H, of metal or other suitable material, having a length approximately equal to that of the binding-plate A′ and slightly wider than the flexible bands D or D′. The said plate is provided at each of its ends with a transverse notch or slot *h*, whereby the said plate is adapted to engage the said bands D and D′, respectively, and prevent the same from bowing outwardly when the strain is removed therefrom.

In devices of this description it may be preferable to provide a base hinged to the said tube, or one may be constructed integral therewith, as shown in Fig. 1, which illustrates a binding-clip such as will be used for invoice-sheets, bills, or other sheets which it is desirable to temporarily retain upon the desk-board. I do not, however, desire to be restricted to any specific form of cover to be used in connection with this binding device, but desire to claim, broadly, as a compression device, and have herein illustrated but one of the many uses to which my invention can be applied.

I claim as my invention—

1. The combination with a movable binding-plate of a tube, a shaft journaled therein, a carriage operated by the rotation of said shaft and a flexible part between and connecting said carriage and the said movable binding-plate.

2. The combination with a movable binding-plate, of a tube, a rotative screw-shaft journaled therein, a carriage operated by the rotation of said screw-shaft, and a flexible part between and connecting said carriage and the movable binding-plate.

3. In combination with a movable binding-plate, of a tube, a screw-shaft journaled therein, carriages oppositely driven by the said screw-shaft and a flexible part between and connecting said carriages and said movable binding-plate, whereby movement of the carriages is communicated to the said binding-plate.

4. In combination with a movable binding-plate, of a tube, a right-and-left-threaded screw-shaft journaled therein, means for rotating said screw-shaft, oppositely-driven carriages operated by said screw-shaft, flexible connections between the carriages and the movable binding-plate, and means for changing the direction of the draft of said carriages, consisting of curved surfaces over which the said flexible connections operate.

5. In combination with a movable binding-plate in a machine of the class described, a tube, a right-and-left-threaded screw-shaft journaled therein, said screw-shaft having one of its extremities angular and adapted to be engaged by a key, oppositely-driven carriages on said screw-shaft, flexible parts between and connecting said carriages and said movable binding-plate, and means for changing the direction of the strain exerted by said carriages to the direction at right angles to the said screw-shaft.

6. In combination with a movable binding-plate, a tube parallel therewith, a right and left screw-shaft journaled therein, means for rotating said shaft, carriages oppositely driven by the said shaft, a flexible cable connecting each carriage with the extremity of the said movable binding-plate, means for changing the direction of the strain upon said cables to a direction perpendicular to the said shaft, consisting of pulleys journaled in the said tube.

7. In combination with a movable binding-plate, a tube parallel therewith, a shaft journaled in said tube, means for rotating the said shaft, carriages on said shaft oppositely driven by the rotation thereof, a flexible band between and connecting said carriages and the extremities of the binding-plate, means for preventing lateral movement of said carriages.

8. In combination with a movable binding-plate, a tube parallel therewith, a shaft journaled therein, means for rotating said shaft, carriages oppositely driven by the rotation of the said shaft, a flexible part between and connecting the said carriages and the said binding-plate, and means for preventing lateral motion of the said carriages, consisting of upwardly-projecting parts adapted to slide in contact with the upper plate of the said tube, and a downwardly-projecting part adapted to slide upon the bottom thereof.

9. The combination with a movable binding-plate, a tube parallel therewith, a rotative shaft journaled in the tube, carriages oppositely driven by the rotation of the shaft, flexible bands connecting the carriage with the binding-plate, and means whereby the capacity of the device may be increased to an amount greater than half the length of the shaft.

10. The combination, with a tube, a rotative shaft journaled therein, carriages oppositely

driven by the rotation of the shaft, a binding-plate, flexible bands connecting the carriages with the binding-plate, said flexible bands having a movable attachment with the binding-plate and acting to increase the capacity of the binder.

11. A binding-plate for a machine of the class described having downwardly-extended sides provided with transverse perforations extending therethrough, said perforations disposed in pairs, equidistant from and on opposite sides of the center, one of said pairs of perforations being located near the center and one pair near the ends of the binding-plate, pins adapted to be removably secured in said perforations and adapted for rigid attachment with flexible bands, and rounded tension-bars rigidly secured near the ends of the binding-plate transversely of the same, and affording a passage for the flexible bands between the upper surface of said bars and the binding-plate.

12. The combination with a tube, a rotative shaft journaled therein, carriages oppositely driven by the rotation of the shaft, a binding-plate, flexible bands connecting the carriages with the binding-plate, means for rotating the shaft, and a slotted plate adapted to engage said bands and hold the same in alinement when the strain is removed therefrom.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 23d day of December, A. D. 1898.

SYDNEY CHARLES NOTT.

Witnesses:
C. W. HILLS,
R. CUTHBERT VIVIAN.