

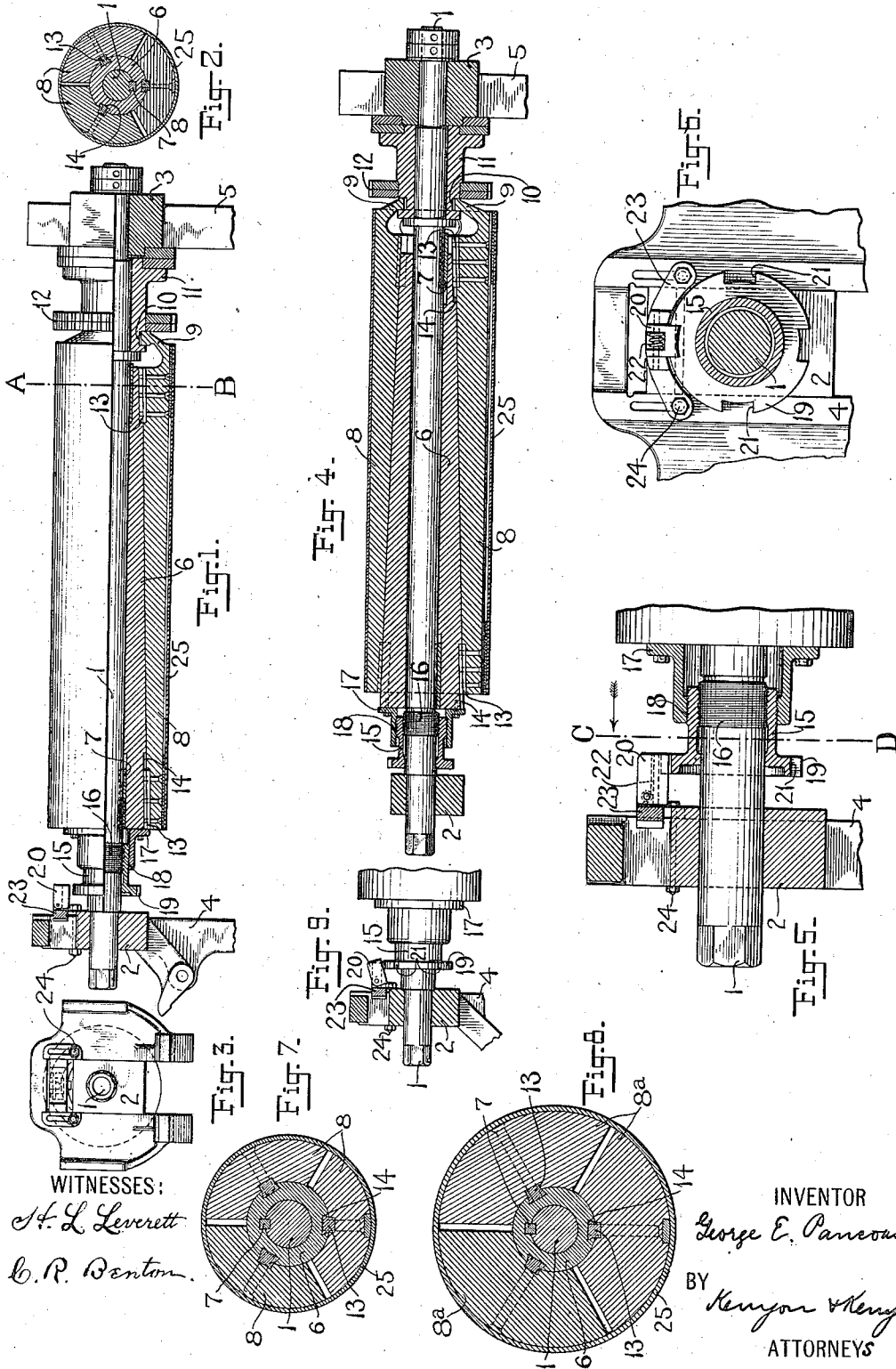
G. E. PANCOAST.

FORM SUPPORT FOR PRINTING PRESSES.

APPLICATION FILED MAR. 6, 1900. RENEWED DEC. 3, 1904.

972,906.

Patented Oct. 18, 1910.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## FORM-SUPPORT FOR PRINTING-PRESSES.

972,906.

Specification of Letters Patent.

Patented Oct. 18, 1910.

Application filed March 6, 1900, Serial No. 7,446. Renewed December 3, 1904. Serial No. 235,332.

### *To all whom it may concern:*

Be it known that I, GEORGE E. PANCOAST, a citizen of the United States, and a resident of Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Form-Supports for Printing-Presses, of which the following is a specification.

My invention relates to form supports for printing presses and more particularly to supports for curved or cylindrical printing forms.

It is desirable to make printing forms and particularly planographic forms used in multicolor presses as thin and light as possible. To permit this the forms must be firmly and accurately supported at every part in order that they may not spring or give under the heavy pressures required in printing. Heretofore thin or shell-like curved printing forms and particularly those that are cylindrical or tubular have been constructed with an inner tapered surface, and the form support has been provided with a correspondingly tapered outer surface. The object of this construction is to firmly support the printing form at every part and yet permit its removal readily and without injury, it only being necessary to use mechanical means to start the form from its support. This construction, however, is very difficult and expensive to produce with the accuracy required in practice. Moreover the printing forms are liable to stick or become set on the supports and if in handling they become dented or distorted in shape it is difficult or impossible to get them on or off their supports, and the supports will not reliably restore them to a true curved or cylindrical shape.

The object of my invention is to provide a form support which has none of the enumerated disadvantages of the tapered construction of the form and its support and yet possesses all the advantages of that construction together with other advantages, among which are these, that the printing forms may be more readily removed and replaced; that any defect in the printing forms as to shape will be eradicated; that the printing forms may be made thinner and lighter; that the support may be made with a lesser degree of accuracy as to its exterior shape and dimensions; and that the printing form may be made with a lesser

degree of accuracy as to its interior shape and dimensions.

With these objects in view my invention consists in the novel parts, improvements and combinations herein shown and described.

The accompanying drawings, which form a part hereof, show a construction embodying my improvements, and serving to illustrate the principles of my invention.

Figure 1 is an elevation partly in section of the form support with a form thereon, together with means for mounting the same in a press. Fig. 2 is a transverse section of the form support taken on line A—B, Fig. 1. Fig. 3 is an end elevation of the parts shown in Fig. 1, looking from the left. Fig. 4 is a longitudinal section of the form support showing the parts in a different adjustment. Fig. 5 is an enlarged sectional view of the parts shown to the left in Fig. 1. Fig. 6 is a transverse section taken on line C—D Fig. 5 and looking in the direction of the arrow. Figs. 7 and 8 are enlarged transverse sectional views illustrating the means for adjusting the form support for forms of different sizes. Fig. 9 is a detail view illustrating the operation of the devices for actuating the expanding mechanism.

Like reference numerals refer to like parts wherever they occur in the several views.

My form support is particularly adapted to be used in multicolor presses and especially that type of multicolor press in which a plurality of curved planographic printing forms are arranged concentrically with a large impression drum, and cooperate therewith to print multicolored designs upon paper or similar material in web form and in approximately instantaneous succession.

In carrying my invention into effect the curved printing forms are preferably made without any taper and the supporting surface, which in the best embodiment of the invention is cylindrical when in operative position, is constructed to be contracted or reduced in diameter in all directions so that the printing forms may be readily placed thereon and removed therefrom, and mechanism is provided for restoring the supporting surface to its cylindrical form such that the printing form supported thereby, even though distorted, will be forced to assume its true curvature.

Referring to the drawings in detail, 1 110

represents a supporting shaft which is journaled in boxes 2 and 3 mounted in any suitable way in the frames 4 and 5 of the press. A sleeve 6 is mounted on the shaft 1, preferably in such manner that it must rotate therewith but may be moved longitudinally thereof, there being provided for this purpose, as shown, a spline and key connection 7 between these parts. The supporting surface of my device is formed by a plurality of sections 8 which rest upon and are carried by the sleeve 6. In order that the diameter of the surface formed by the sections 8 may be reduced to receive a printing form and then forcibly expanded again, the exterior of the sleeve 6 is longitudinally tapered preferably from end to end, as shown, and the interior surface of the sections 8 are correspondingly tapered so that they will exactly fit the tapered surface of the sleeve 6 when the support is expanded to operative position. The sections 8 are withheld from longitudinal movement with the sleeve 6 by the segmental extensions 9, which engage a corresponding groove 10 formed in a collar 11 rigidly secured near one end of the shaft 1. The shaft 1 is driven and with it the form support by a gear 12 carried by the collar 11. The sections 8 are held in place on the sleeve 6 and are confined to rotate therewith by the dovetailed keys 13 which engage corresponding undercut key ways 14 formed in the sleeve 6. By reason of the engagement of the dovetailed keys 13 with the undercut key ways 14 in the sleeve 6 the sections 8 are caused to move inwardly as well as outwardly by the longitudinal movement of the sleeve 6.

The sleeve 6 may be moved longitudinally to expand or contract the supporting surface by any suitable means. The means shown and preferably used consist of a sleeve 15 mounted on the shaft 1 and engaged therewith by a thread 16. The sleeve 15 is connected to the sleeve 6 by a ring or thimble 17 bolted or otherwise secured at one end to the sleeve 6 and engaged with the sleeve 15 by a thread 18 having a pitch opposite to that of thread 16. The sleeve 15 is provided with a head 19, by which it may be turned on the shaft 1 or held from turning with the shaft. It will be seen that any movement between the sleeve 15 and the shaft 1 will operate to move the tapered sleeve 6 in one direction or the other, depending on the direction of the movement between the sleeve 15 and shaft. The expanding and contracting operations are preferably accomplished by holding the sleeve 15 and rotating the shaft by the mechanism provided in the press for rotating the printing cylinder, as more speed and greater force in the operation can be secured in this way. For the purpose of holding the sleeve 15 against rotation with the shaft 1, a dog

or detent 20 is mounted adjacent to the shaft 1, and preferably in such position that when the shaft is moved upward, or so as to carry the printing surface away from the impression surface, the head 19 will be brought into engagement with the dog 20. The head 19 is provided with a recess or series of recesses 21 and the dog 20 is preferably pivoted and held in its normal position by a spring 22, as shown, so that the dog can yield when the head is brought into engagement therewith, as indicated in Fig. 9. When the shaft is turned and one of the recesses 21 arrives in alinement with the dog 20, the dog will snap into the recess and prevent further turning of the sleeve 13. The dog is carried by a bracket 23 secured to the housing for the box 2. The bracket is held in place by bolts 24 and may be adjusted up or down to suit the various positions occupied by the shaft 1 when printing forms of different sizes are used.

It is desirable that the form support should be adjustable for forms of different curvatures or diameters. To this end the sections 8 are made removable and may be replaced by sections 8<sup>a</sup> of different radial dimensions, as indicated in Fig. 9. To permit ready removal of the sections 8 or 8<sup>a</sup> the keys 13 and their key-ways 14 are so constructed and arranged that when the sleeve 6 is withdrawn to the limit of its movement to the left, the keys 13 will be withdrawn from the under cut part of the key ways 14, thus leaving the sections 8 or 8<sup>a</sup> free to be removed. A printing surface 25 is shown in place upon the support in several of the figures.

While the operative adjustment of the supporting surface formed by the sections 8 or 8<sup>a</sup> in the embodiment of my invention which is illustrated, is the fully expanded adjustment of that surface, it is obvious that some other adjustment might be made the operative one the essential in this respect being that when the supporting surface is in its operative adjustment, the combined outer surfaces of the sections 8 or 8<sup>a</sup> form a true cylindrical supporting surface which may be reduced in diameter in all directions. The sections 8 are, preferably and as shown, so constructed as to form a substantially complete supporting surface when in the operative position or adjustment. This construction is permissible by reason of the fact that the contraction of the supporting surface from operative position only needs to be very slight, and the space between adjacent sections may, therefore, be so small as practically not to interrupt the supporting surface.

My invention is not limited to the particular construction illustrated or to the particular construction by which it is carried into effect, as various changes may be made therein without departing from the prin-

ciple of my invention and many such changes will readily suggest themselves to skilled mechanics.

What I claim as new and desire to secure by Letters Patent, is:—

1. A contractible and expansible support for a printing form comprising a plurality of radially adjustable supporting sections and means for adjusting them, said sections being removable and replaceable by sections of different dimensions, whereby the effective diameter of the support may be varied for forms of different curvatures, substantially as described.
2. A support for a printing form adjustable in diameter and constructed to present, in one adjustment, a substantially complete and a true and uniform curved supporting surface which may be reduced in diameter in all directions, substantially as described.
3. A support for a printing form adjustable in diameter and constructed to present, in one adjustment, a substantially complete and a true and uniform cylindrical supporting surface which may be reduced in diameter in all directions, substantially as described.
4. A support for a printing form comprising radially adjustable sections so constructed that they together present, in one adjustment, a substantially complete and a true and uniform curved supporting surface which may be reduced in diameter in all directions, substantially as described.
5. A support for a printing form comprising radially adjustable sections so constructed that they together present, in one adjustment, a substantially complete and a true and uniform curved supporting surface which may be reduced in diameter in all directions, said sections being removable and replaceable by sections of different dimensions, whereby the diameter of the support may be varied for forms of different curvatures.
6. A contractible and expansible support for a printing form constructed to be contracted in all directions and to present, when fully expanded, a substantially complete supporting surface having a true circular outline.
7. A contractible and expansible support for a printing form comprising radially adjustable supporting sections so constructed that they together present, when in the outermost position, a substantially complete and a true and uniform curved supporting surface.
8. A contractible and expansible support for a printing form comprising radially adjustable supporting sections so constructed that they together present, when in the outermost position, a substantially complete and a true and uniform curved supporting

surface, said sections being removable and replaceable by sections of different dimensions, whereby the diameter of the support may be varied for forms of different curvatures.

9. A contractible and expansible support for a printing form comprising radially adjustable supporting sections held against longitudinal movement and having longitudinally tapered inner surfaces, a shaft, an inner expanding section mounted thereon and having a longitudinally tapered outer surface, and means for moving said inner section longitudinally.

10. A contractible and expansible support for a printing form comprising radially adjustable supporting sections held against longitudinal movement, a shaft, an inner adjusting section mounted thereon, and means for moving said inner section longitudinally consisting of a sleeve threaded on the shaft and engaging said adjusting section by a thread of the opposite pitch.

11. A contractible and expansible support for a printing form comprising radially adjustable supporting sections held against longitudinal movement and having longitudinally tapered inner surfaces, a shaft, an inner adjusting section mounted thereon and having a longitudinally tapered outer surface, and means for moving said inner section longitudinally consisting of a sleeve threaded on the shaft and engaging said adjusting section by a thread of the opposite pitch.

12. The combination in a press with a contractible and expansible support for a printing form, of a supporting shaft therefor, means for turning said shaft, devices for contracting or expanding said support, and means for operating said devices including a part rotatably mounted on said shaft and means for holding said part against rotation with the shaft.

13. The combination in a press with a contractible and expansible support for a printing form, of a supporting shaft therefor, means for turning said shaft, devices for contracting or expanding said support, and means for operating said devices including a part threaded on the shaft and engaging said devices by a thread of the opposite pitch and means for holding said part against rotation with the shaft.

14. In a printing press, a support for planographic surfaces adjustable in diameter and constructed to present in one adjustment a substantially complete supporting surface having a substantially true and uniform circular outline, which surface may be reduced in diameter in all directions substantially as described.

15. In a printing press, a support for planographic surfaces comprising radially adjustable sections so constructed that they

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together present, in one adjustment, a substantially complete supporting surface having a substantially true and uniform circular outline, which surface may be reduced 5 in diameter in all directions substantially as described.

16. A contractible and expansible support for printing forms comprising radially adjustable supporting sections, means for 10 supporting and radially adjusting said sections, one of said parts being movable longitudinally with relation to the other, the connections between said parts being constructed to release the sections when the 15 parts are at one limit of their relative movement.

17. A contractible and expansible support for printing forms, comprising radially adjustable supporting sections, means for 20 supporting and radially adjusting said sections, said means being constructed to release said sections when they are in their most contracted condition.

18. A contractible and expansible supporting cylinder for printing forms comprising radially movable supporting sections, and positively acting means independent of the forms for moving said sections 25 radially inward from their supporting positions to release the forms, substantially as described.

19. A contractible and expansible supporting cylinder for printing forms comprising radially movable supporting sections, and means independent of the forms 35 whereby said sections may be positively moved inwardly from their supporting positions to release the forms, substantially as described.

20. A contractible and expansible supporting cylinder for printing forms comprising radially moving supporting sections, and positively acting means independent of the forms for moving said sections inwardly from their supporting positions to 45 release the forms, substantially as described.

21. A contractible and expansible supporting cylinder for printing forms comprising radially moving supporting sections, and positively acting means independent of 50 the forms for moving said sections inwardly from their supporting positions to release the forms, said means being constructed to prevent relative movement in a longitudinal direction between said sections. 55

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE E. PANCOAST.

Witnesses:

GEO. H. BARNES,  
JACOB MILLER.