

(No Model.)

3 Sheets—Sheet 1.

E. N. BLUE.

PREPARING PRINTED SHEETS FOR DRYING.

No. 441,924.

Patented Dec. 2, 1890.

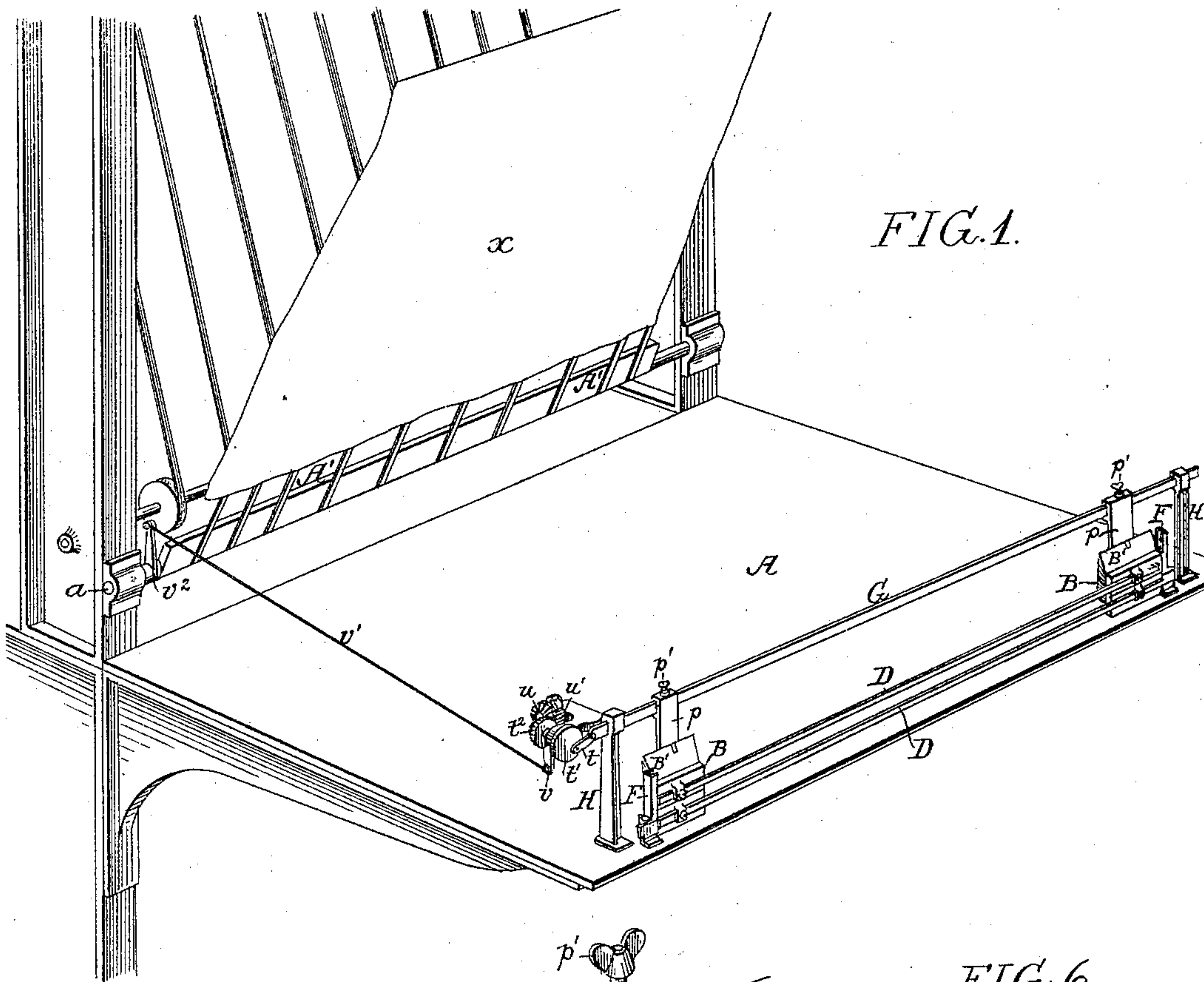


FIG. 1.

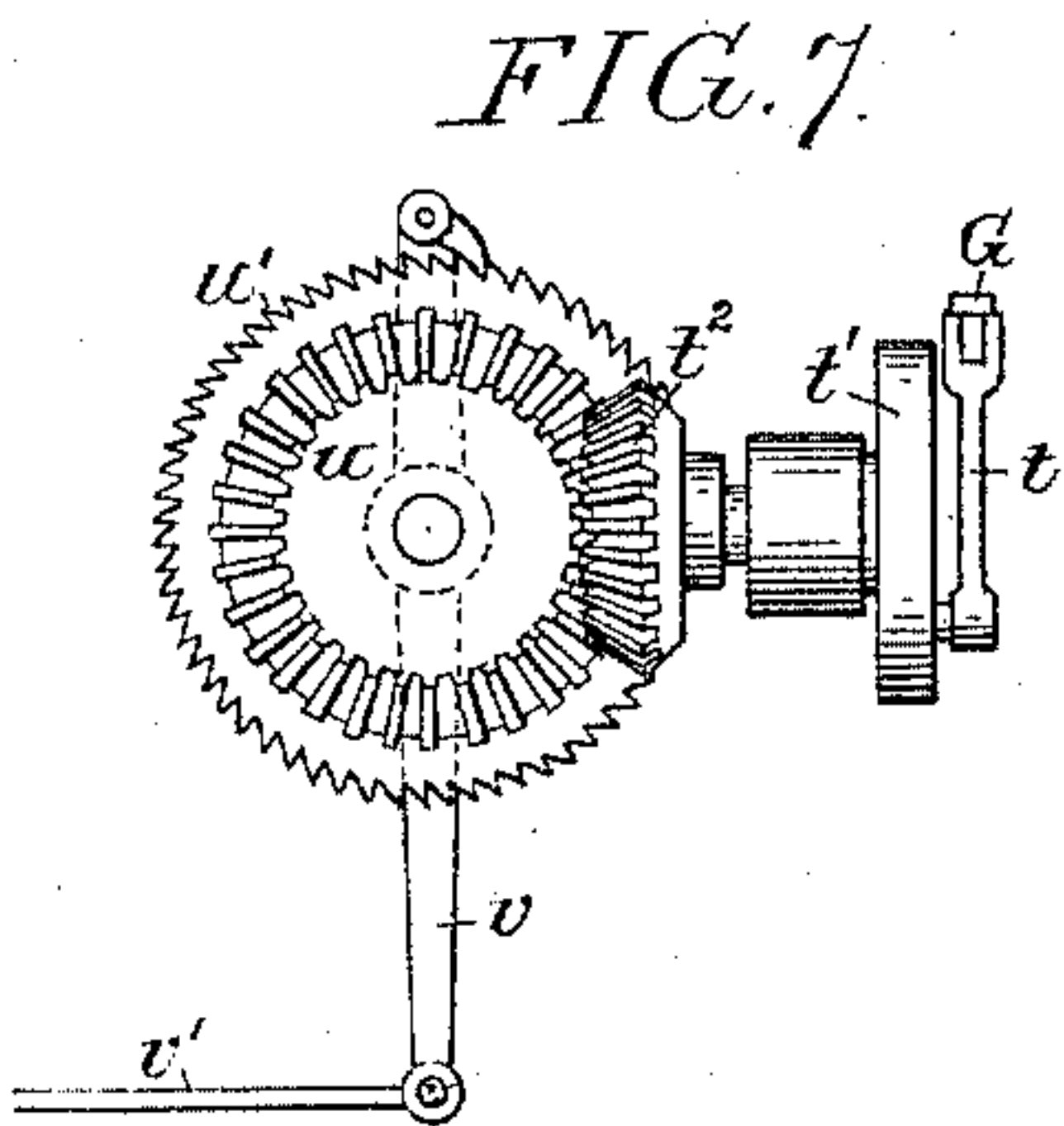


FIG. 7.

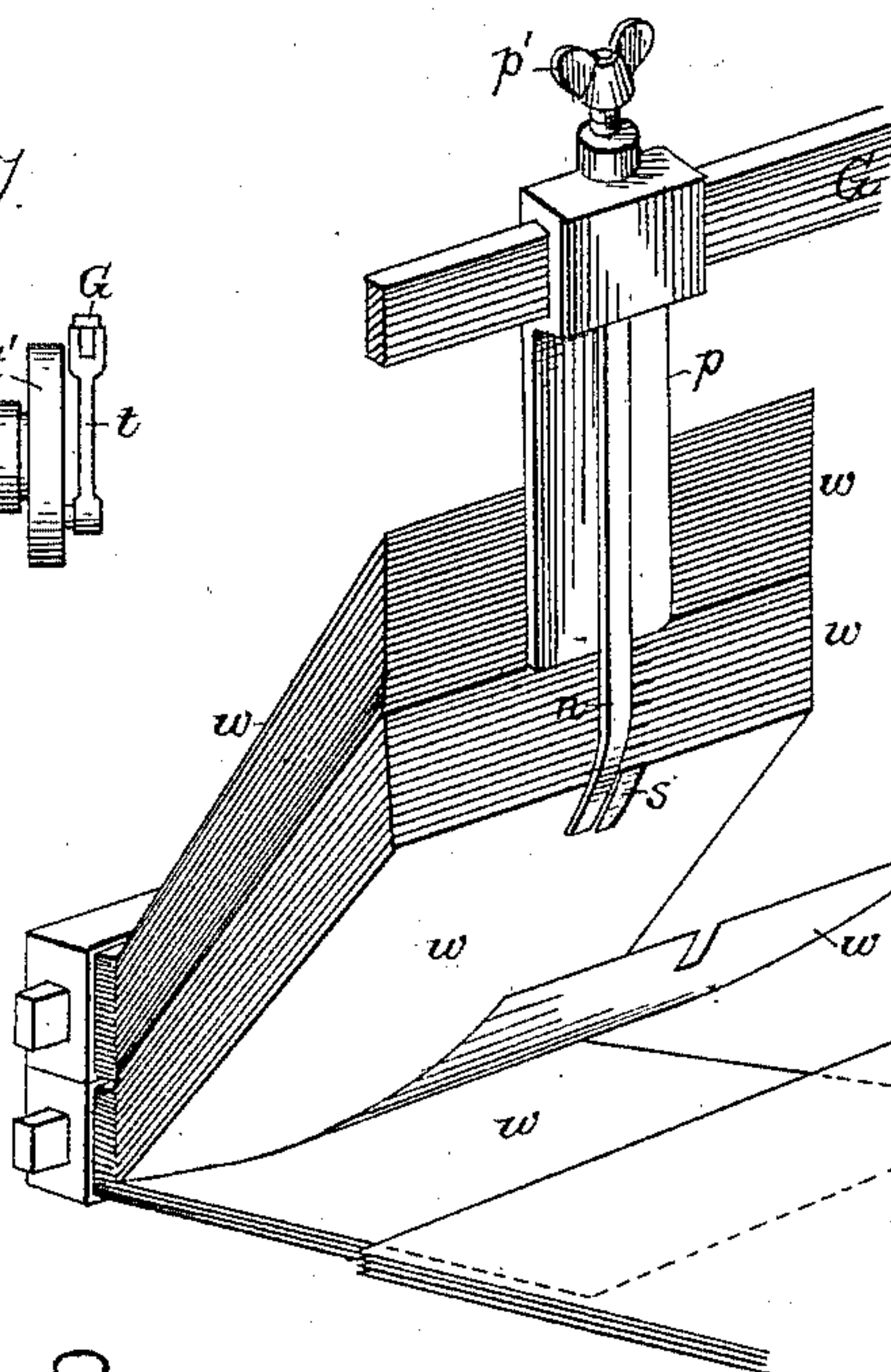


FIG. 5.

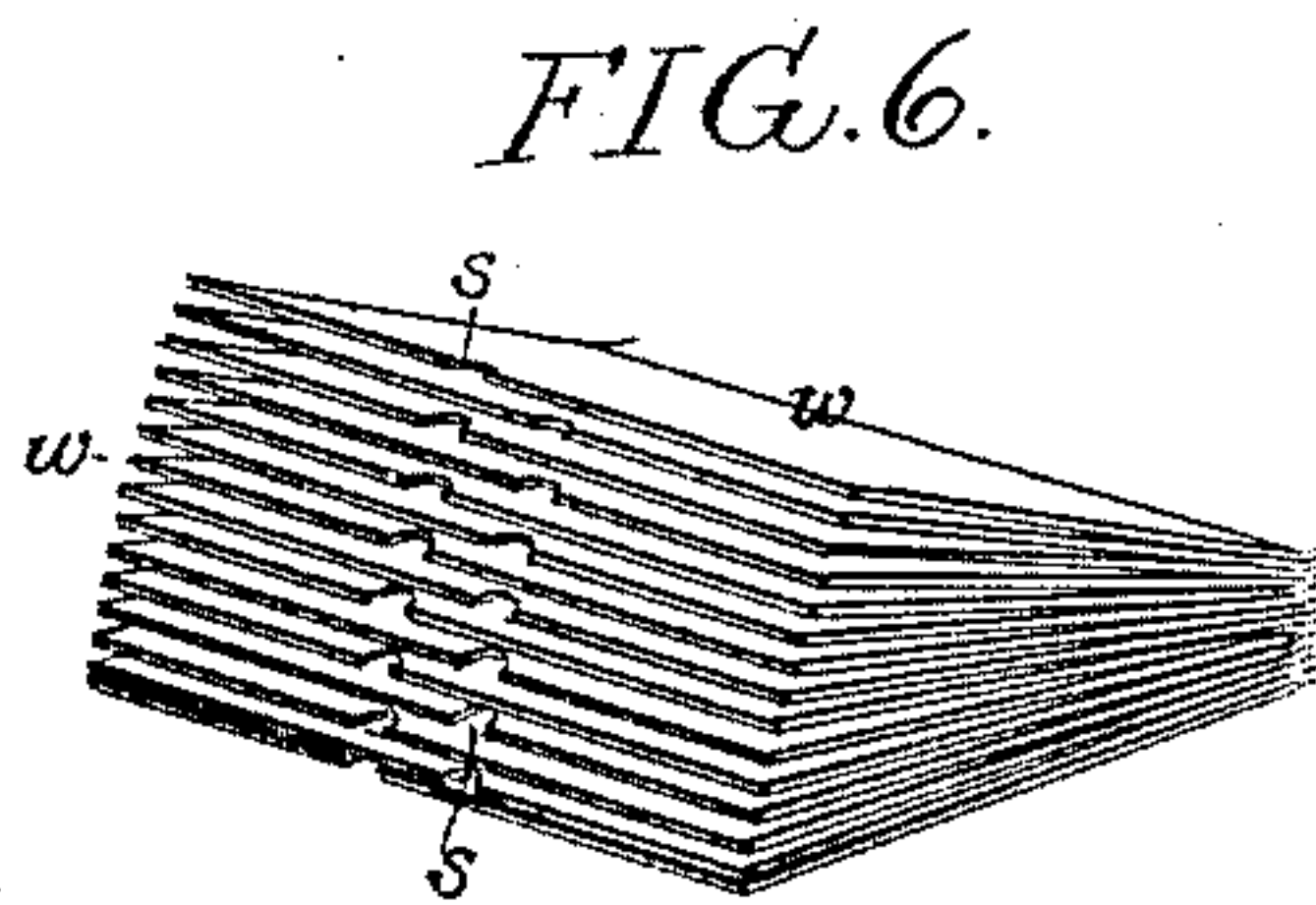


FIG. 6.

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Inventor:  
Edwin N. Blue  
by his Attorneys  
Howson & Howson

(No Model.)

3 Sheets—Sheet 2.

E. N. BLUE.

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FIG. 2.

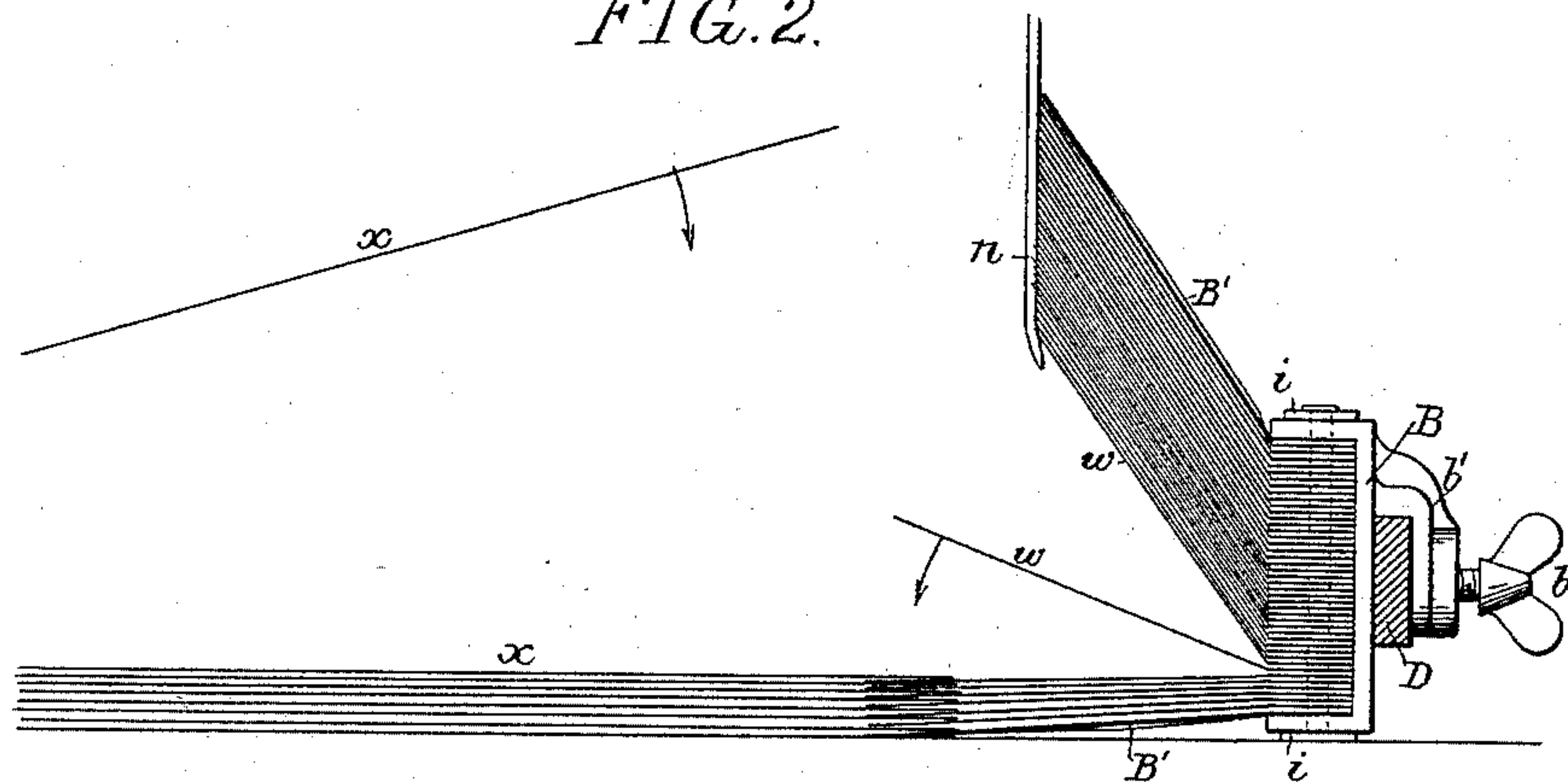


FIG. 3.

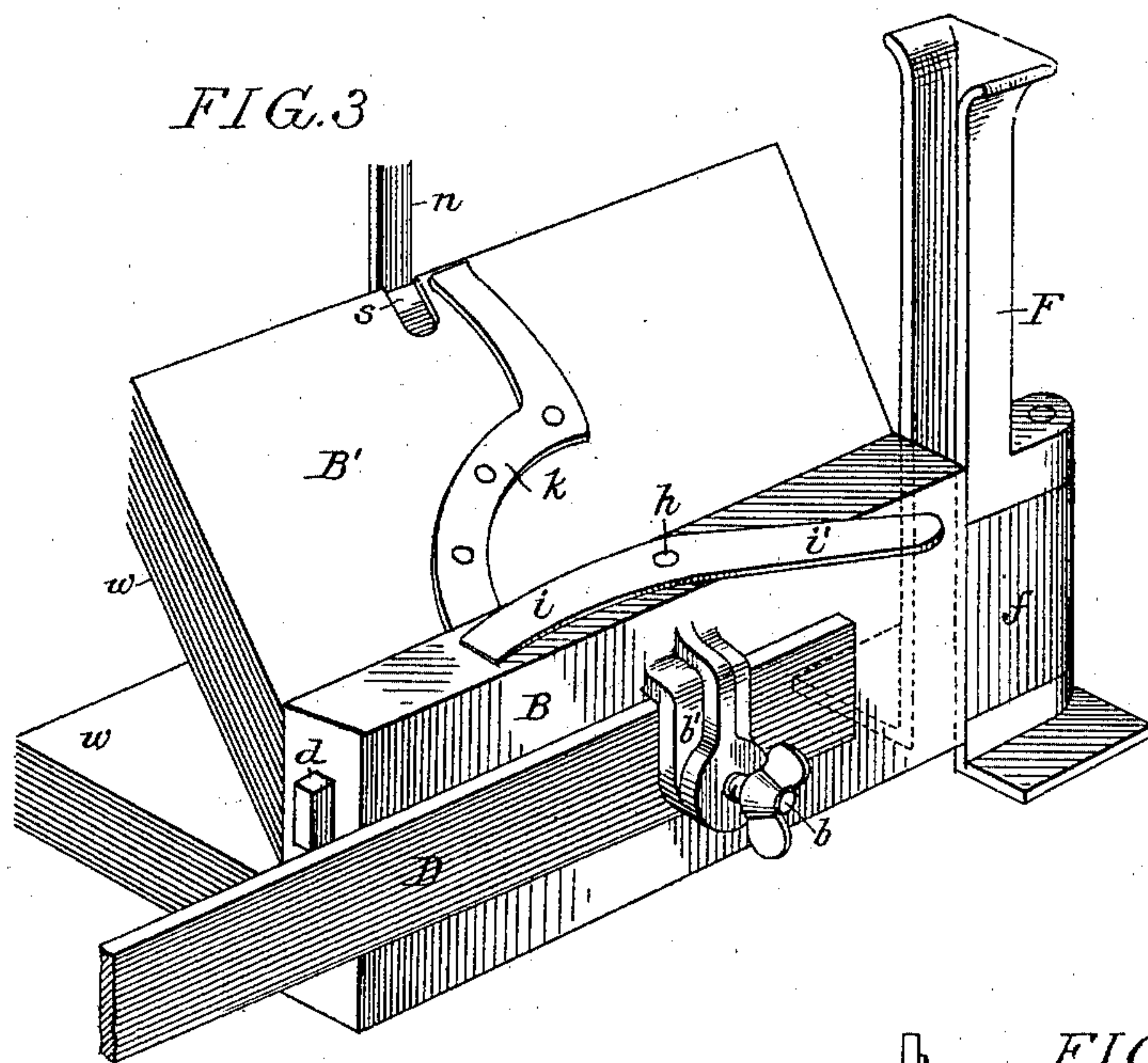


FIG. 8.

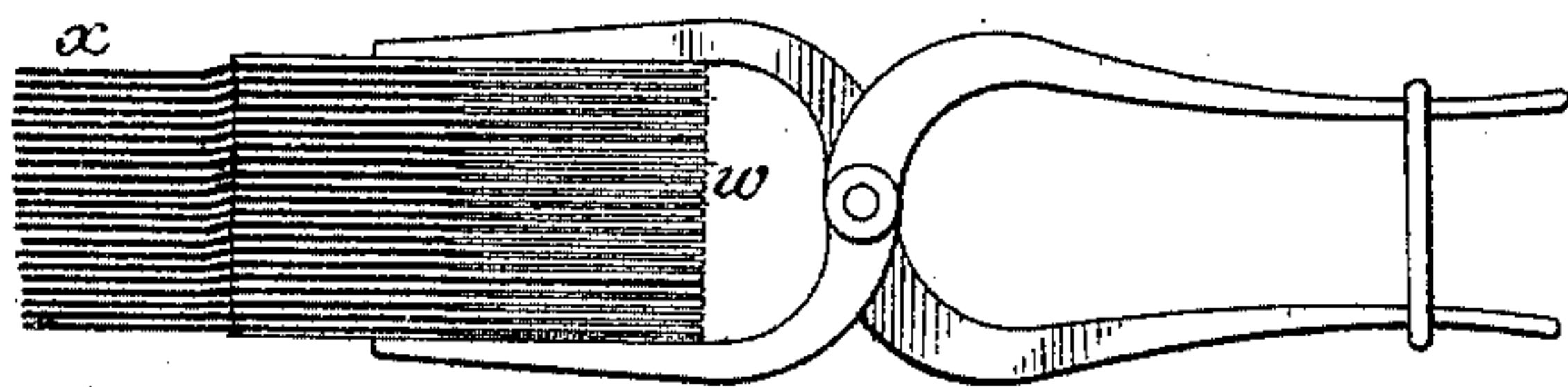
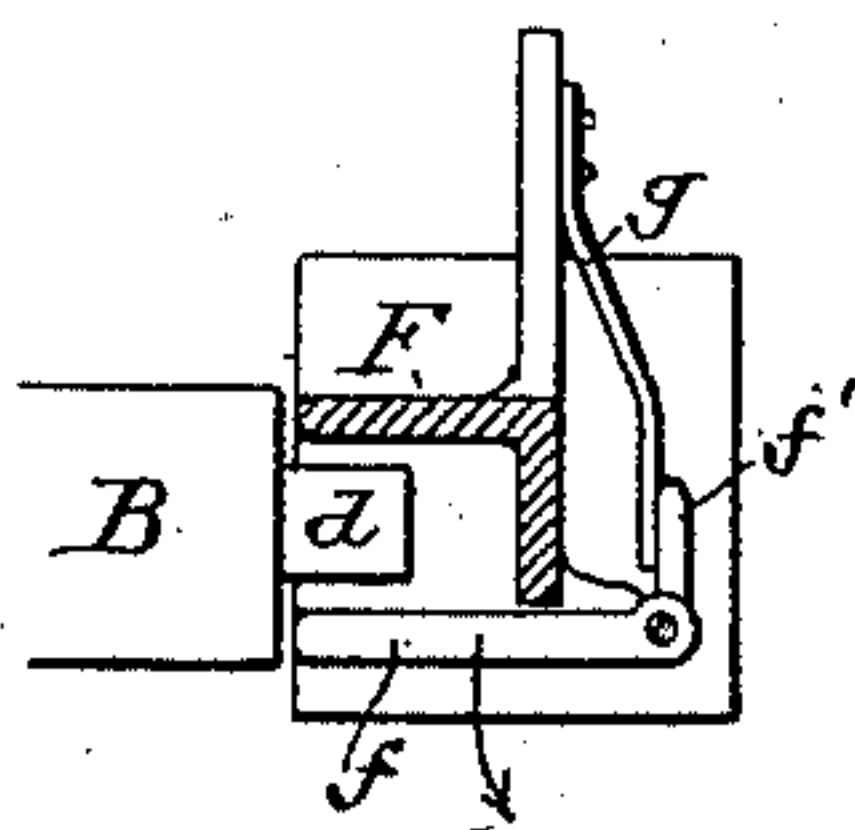


FIG. 4.



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(No Model.)

3 Sheets—Sheet 3.

E. N. BLUE.

PREPARING PRINTED SHEETS FOR DRYING.

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FIG. 11.

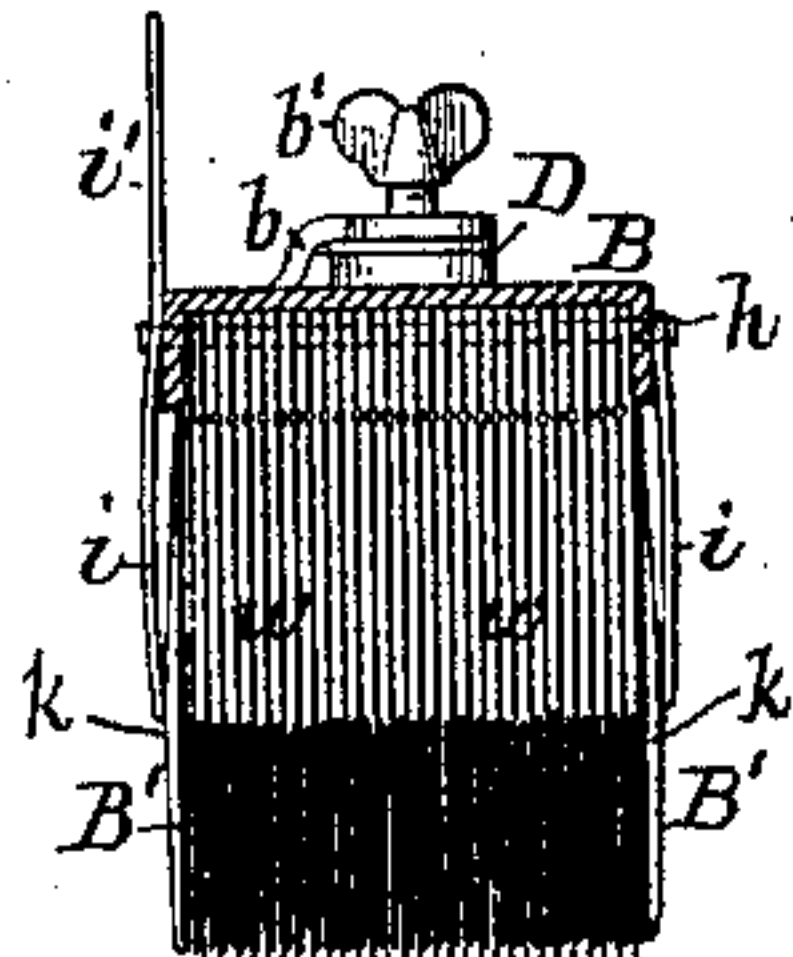


FIG. 9.

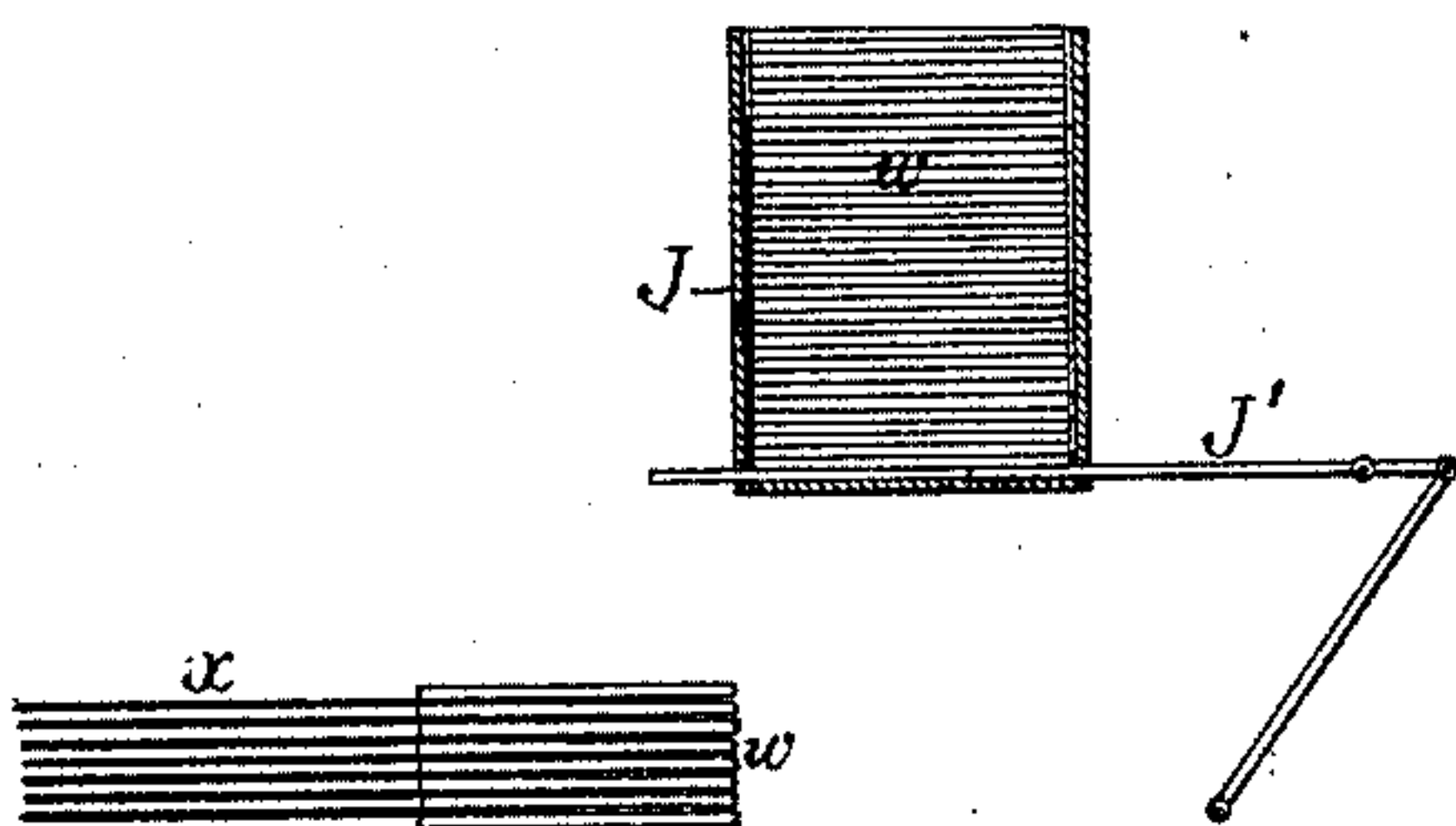
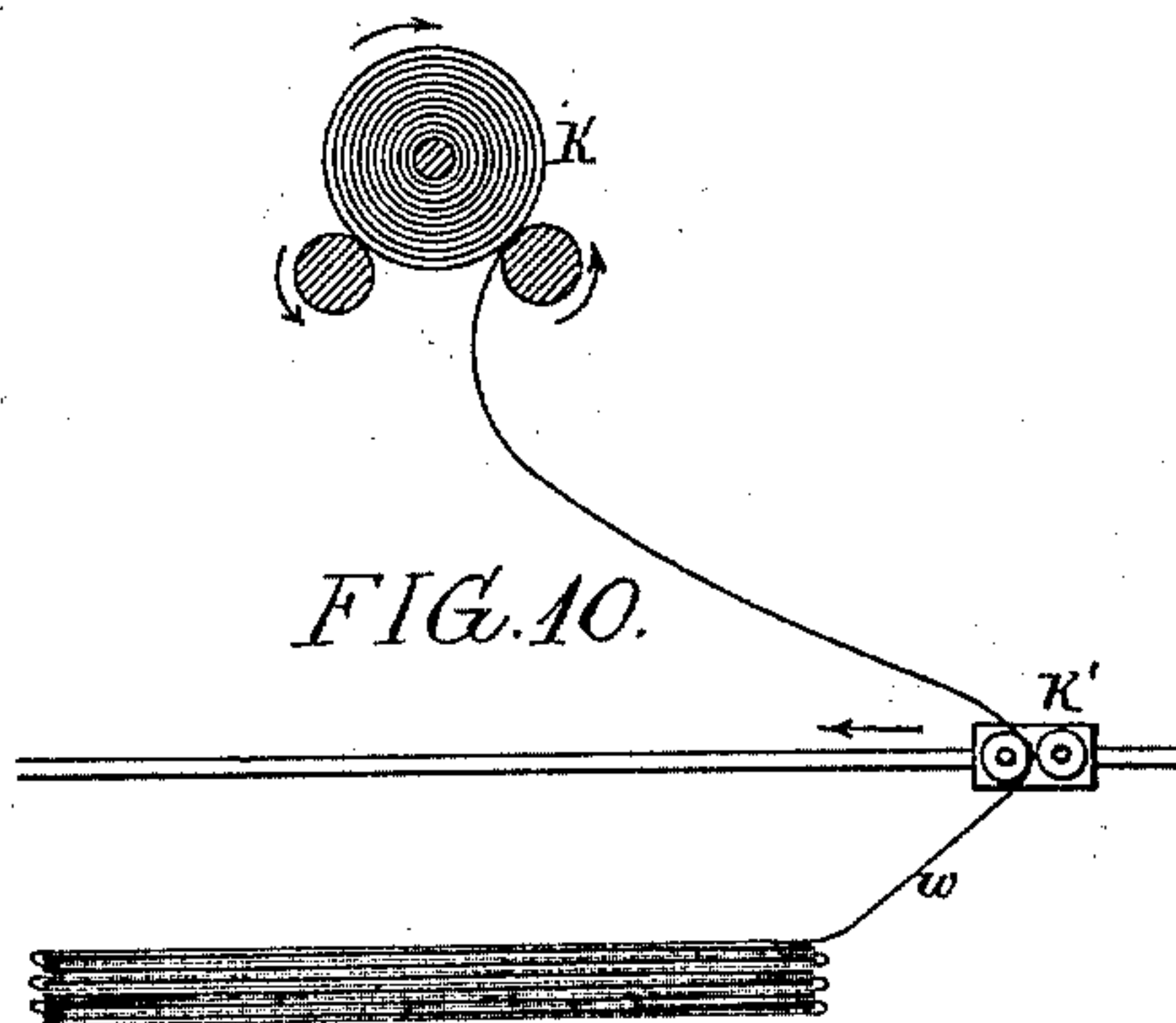


FIG. 10.



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# UNITED STATES PATENT OFFICE.

EDWIN N. BLUE, OF PHILADELPHIA, PENNSYLVANIA.

## PREPARING PRINTED SHEETS FOR DRYING.

SPECIFICATION forming part of Letters Patent No. 441,924, dated December 2, 1890.

Application filed December 12, 1889. Serial No. 333,384. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN N. BLUE, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Preparing Printed Sheets for Drying, of which the following is a specification.

The object of my invention is to dispense with the rehandling, slip-sheeting, racking, and other manipulations now usually resorted to in effecting the drying of color-printed or other heavily-inked sheets; and this object I attain by introducing narrow guard-strips between the outer edges of the sheets as they are delivered from the press, so that when a pile of sheets of any desired size has been delivered the sheets may be clamped together at the outer edges and suspended in the drying-room, the narrow guard pieces or strips introduced between the outer edges of the printed sheets serving to separate the latter, so that the air has free access to the entire printed surface of each sheet, and the drying of the latter is effected much more rapidly than when the sheets are piled in racks, as usual, the usual manipulations of the sheet between the time that it is printed and the time that it is dried being, moreover, rendered unnecessary, as are also the racks in which the sheets are usually piled for drying.

In the accompanying drawings, Figure 1 is a perspective view of sufficient of a printing-press to illustrate the application thereto of means for carrying out my invention. Fig. 2 is an enlarged sectional view of the device to which my invention relates. Fig. 3 is an enlarged perspective view of one end of the device shown in Fig. 1. Fig. 4 is a sectional plan view of part of the same. Fig. 5 is a perspective view looking in a different direction from that in which the view, Fig. 3, is taken. Fig. 6 is a perspective view, on an enlarged scale, of part of a series of guard-sheets. Fig. 7 is an enlarged view of part of the driving mechanism. Figs. 8 to 10 are diagrams illustrating modifications of the invention, and Fig. 11 is a view illustrating the method of drying the sheets when said sheets are prepared for drying in accordance with my invention.

In color-printing or other establishments

where heavily-inked sheets are printed the drying of the printed sheets as it is at present effected is a troublesome and expensive operation, for the printed sheets must either be piled separately in drying-racks, or a pile of the sheets must be prepared by introducing slip-sheets between the successive printed sheets, so that each sheet must be handled several times after it leaves the press, and when the piles of sheets are slip-sheeted the drying of the sheets is a very slow operation, as the air cannot gain direct access to the printed surface of each sheet, while if the printed sheets are laid singly in the drying-racks an enormous amount of space is required for drying purposes, irrespective of the expense of the racks.

My invention has been devised with the view of overcoming these objections, and it is based upon an essentially different manner of drying the sheets—namely, by subjecting them to the action of the air while suspended, and separated from each other to a slight extent at the point of suspension, so that there will be an air-space between the adjoining sheets and the air can gain access to all portions of the printed surfaces of the sheets, the natural tendency of the suspended sheets to fly apart at their lower edges facilitating the admission of the air to the spaces between the sheets.

In Fig. 1 of the accompanying drawings I have shown devices for preparing the printed sheets for drying in accordance with my invention, these devices being mounted upon the delivery-table A of a printing-press of the ordinary construction, of which A' represents the fly-frame mounted upon a rock-shaft a, to which a vibrating motion is imparted, as usual in presses of this class. The guard-strips w, which are to be introduced between the outer edges of the printed sheets x as the latter are delivered by the press, are preferably confined together in book form, each leaf w comprising an inner and outer portion with flexible joint, so that while the inner portions of the leaves may be rigidly confined together the outer portions will be free to be moved back and forth.

In the present instance the rear portion of a book or pack of the leaves w is confined with-



in a frame or back B of any suitable material, preferably thin sheet metal, and the top and bottom leaves B' of the book or pack are also, by preference, of sheet metal, in order to impart the desired stability to the book and permit a clamping action thereon without injury to the said outer leaves of the book. As shown in Fig. 1, a book of this character is employed adjacent to each of the opposite side edges of the printed sheets, the two books being connected by a rod D, clamped to the back of each book by a set-screw *b*, carried by a bracket *b'*, as shown in Fig. 3.

The back B of each book has at its opposite ends one or more lugs *d*, which are guided in U-shaped standards F, mounted upon the table A, so that two or more books can be introduced at one time, the books lying one above the other, in order that the upper book may fall into place when the lower book is removed, carrying with it the sheets which have been interleaved therewith, provision for such removal being made by constructing each of the standards F with a hinged gate *f*, an arm *f'* of which is acted upon by a spring *g*, so as to keep this gate normally closed, as shown in Figs. 3 and 4, the gate being permitted to yield in the direction of the arrow, Fig. 4, however, in order to permit the escape of the lugs *d* of the book from the vertical guideway of the standard. Before withdrawing the book and its interleaved sheets, however, pressure should be exerted upon the opposite leaves or covers B' of the book, so as to clamp the leaves of the book firmly together and upon the edges of the sheets interleaved therewith, and for this purpose the back of the book is preferably provided with a shaft *h*, carrying arms *i*, one above and one beneath the book, these arms acting upon cam-plates *k*, carried by the cover-plates B' of the book, and one of the arms being provided with an extension or handle *i'*, by which the arms may be manipulated so as to cause them to bear upon the cam-plates *k*. When a pile of sheets with its opposite clamping-books and their connecting-rod have been removed, said rod provides a convenient means of suspending the sheets in the drying-room. When so suspended, the fact that the sheets are separated at their upper edges by the interposed guard-strips *w* prevents the contact of the printed face of one sheet with the back of the adjoining sheet, and insures a circulation of air between the adjoining sheets, this circulation being, as before remarked, assisted by the natural tendency of the sheets to spread apart at the bottom, as shown in Fig. 11.

Various means may be adopted for permitting the leaves or strips *w* to fall successively as the printed sheets are successively deposited upon the pile on the table A; but the device which I prefer for this purpose is a finger *n*, reciprocated across the face of the book of leaves or strips, each of said leaves or strips having at its outer edge a notch *s*, which,

when the finger is moved into line therewith, permits the leaf to fall, the notches of the leaves, however, being alternately in different planes represented by the successive stops of the finger. Thus if these stops are at the opposite ends of the reciprocating movement of the finger the notches in the successive leaves would be in line alternately with these extremes of movement, as shown in Fig. 6, while if the finger made two or more stops in each reciprocation the notches in the leaves of the book would be located accordingly. Each movement of the finger thus serves to release one leaf, and the movements of the finger are so timed as to occur in the intervals between the delivery of sheets. Hence it follows that a leaf *w* will be allowed to fall upon and overlap the outer edge of each printed sheet as it is deposited.

The fingers may be operated from any convenient part of the press; but they are in the present instance carried by plates *p*, which are confined by means of set-screws *p'* to a transverse bar G, mounted so as to be free to slide in suitable standards H on the table A, one end of this bar being connected by a link *t* to a crank-pin on a disk *t'*, which, as shown in Figs. 1 and 7, is carried by a shaft having a bevel-wheel *t''*, meshing with a bevel-wheel *u* on a shaft having a ratchet-wheel *u'*, with which engages a pawl on an arm *v*, connected by a rod *v'* to an arm *v''* on the rock-shaft *a* of the fly-frame. The plate *p* is wider than the finger *n*, so as to prevent the leaves of the upper book from falling down into position until such time as desired.

Although I have described my invention as applied to a press in which the sheets are delivered by a fly-frame, it will be evident that it can be applied as well to presses having other means of delivery, so long as the sheets are delivered successively and in the same or substantially the same alignment, and the minor details of the device may also be modified in numerous ways without departing from the essential features of my invention. For instance, a single book having leaves extending the whole width of the printed sheet may be employed in place of the opposite books shown; or, on the other hand, more than two books may be employed, and many different forms of clamps can be used for imparting pressure to the leaves of the book, in order to prevent the accidental release of the interleaved sheets therefrom while said sheets are being carried from the press to the drying-room or while suspended in the latter. For instance, in Fig. 8 I have shown a form of lever-clamp for the purpose.

As an instance of another means which may be employed for depositing guard-strips successively and in alternation with the printed sheets, I have shown in Fig. 9 a receptacle J, the front and rear sides of which have slots at the bottom, so that the bottom strips of the pile in the receptacle may be discharged therefrom by a reciprocated pusher-blade J'.



A continuous guard-strip may also be used in place of the successively-deposited independent strips, if desired, an instance of such use being shown in Fig. 10, the continuous strip being fed from a roller or drum K, suitably located above the table A, and being laid back and forth across the pile of sheets at one end of the latter by a transversely reciprocating guide-block or carrier K'.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The mode herein described of preparing printed sheets for drying, said mode consisting in interleaving narrow guard-strips with the printed sheets as the latter are successively delivered, clamping the printed sheets and guard-strips together, and suspending the clamped sheets so that the edges with the interposed guards are uppermost, substantially as specified.

2. The combination of the sheet-delivery apparatus of a printing-press with guards for separating the successive printed sheets of the pile near one edge, and with mechanism, substantially as described, operatively connected with the press, for laying said guards in alternation with the sheets as they are delivered by the press, whereby said sheets and the guards will be interleaved, substantially as specified.

3. The combination of the sheet-delivery apparatus of a printing-press with a series of guard-strips supported adjacent to one edge of the pile of sheets, and mechanism, substantially as described, operatively connected with the press, for releasing said guard-strips successively, so that they will be laid in alternation with the printed sheets at and near one edge of the pile, substantially as specified.

4. The combination of the sheet-delivery apparatus of a printing-press with a series of guard-strips, means for binding the same together in the form of a book, a support for said book adjacent to one of the edges of the delivered sheets, and a movable stop-finger for releasing the strips or leaves successively and in alternation with the delivery of the sheets, substantially as specified.

5. The combination of the delivery apparatus of a printing-press, guards supported

adjacent to one of the edges of the delivered sheets, a movable stop-finger for laying said guards successively in alternation with the delivered sheets at and near one edge of the latter, and clamps mounted upon the guard-carriers for securing the guard-strips together and to the printed sheets, substantially as specified.

6. The combination of the delivery apparatus of a printing-press, two or more sets of guard strips or leaves, each confined in book form, a rod or bar connecting said books, and a movable stop-finger for releasing in succession the leaves of each of the books, substantially as specified.

7. The combination of the delivery apparatus of a printing-press, a series of guard strips or leaves, a movable stop-finger for releasing the same successively and in alternation with the delivery of the sheets, a back or frame for confining the strips or leaves, and a guide for said frame having a yielding gate to permit of the detaching of the frame therefrom, substantially as specified.

8. The combination of the series of guard strips or leaves having notched edges and having the notches of successive leaves in different planes, with a movable retaining and releasing finger, and with mechanism, substantially as described, for operating the same so that it will be brought successively into line with the notches in the successive strips or leaves, substantially as specified.

9. The combination of the fly-frame of the press, a series of guard-strips supported adjacent to one of the edges of the sheets delivered by said frame, mechanism, substantially as described, for releasing said guard-strips successively, and mechanism, substantially as described, intermediate of said releasing device and the fly-frame, whereby the guard-strips are applied in alternation with the printed sheets, substantially as specified.

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

EDWIN N. BLUE.

Witnesses:

R. SCHLEICHER,  
HARRY SMITH.