

No. 721,011.

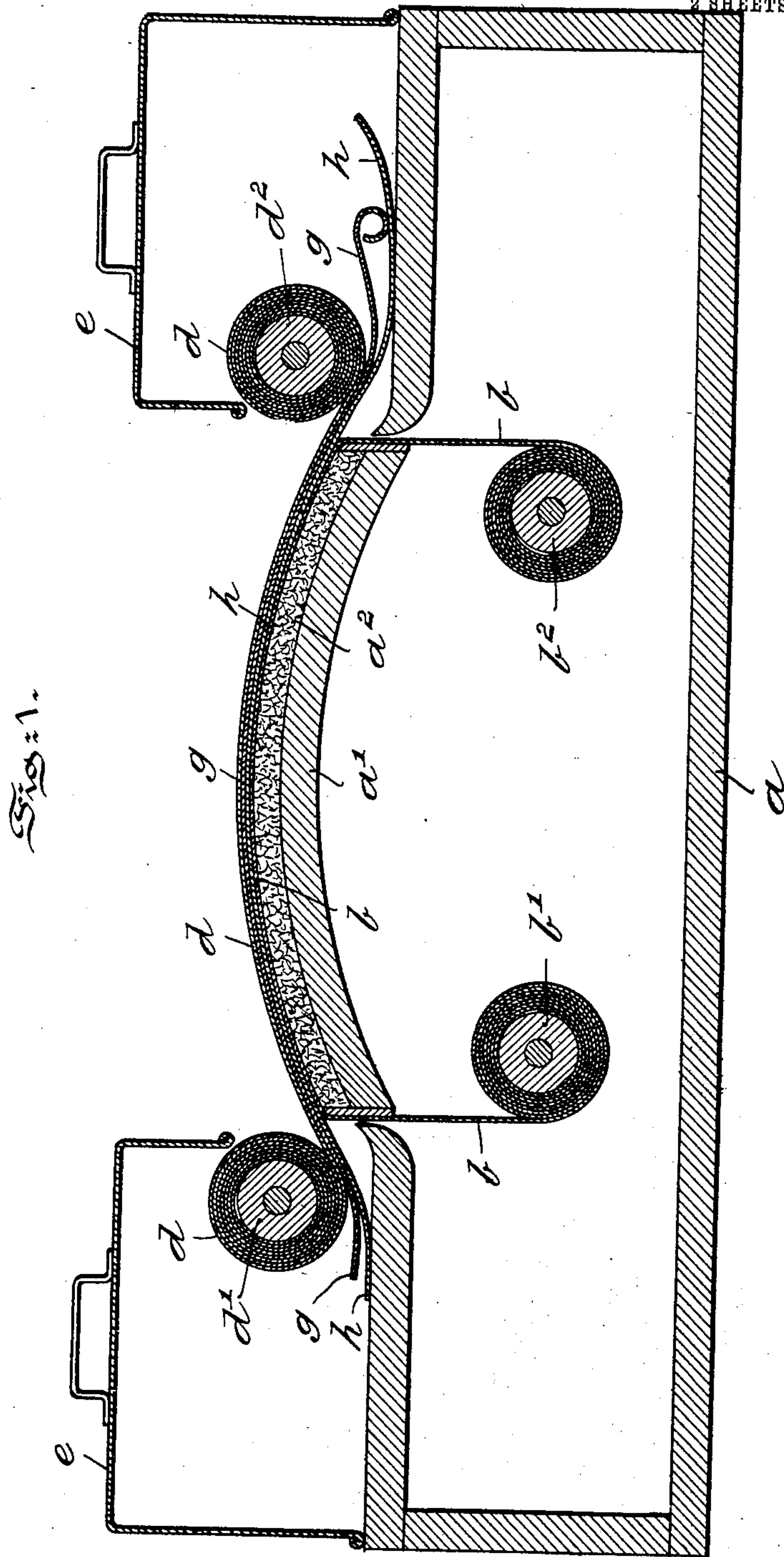
PATENTED FEB. 17, 1903.

N. H. BROWN.
PHOTOGRAPHIC PRINTING APPARATUS.

APPLICATION FILED DEC. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
Wilhelm Vogt
Thomas M. Smith.

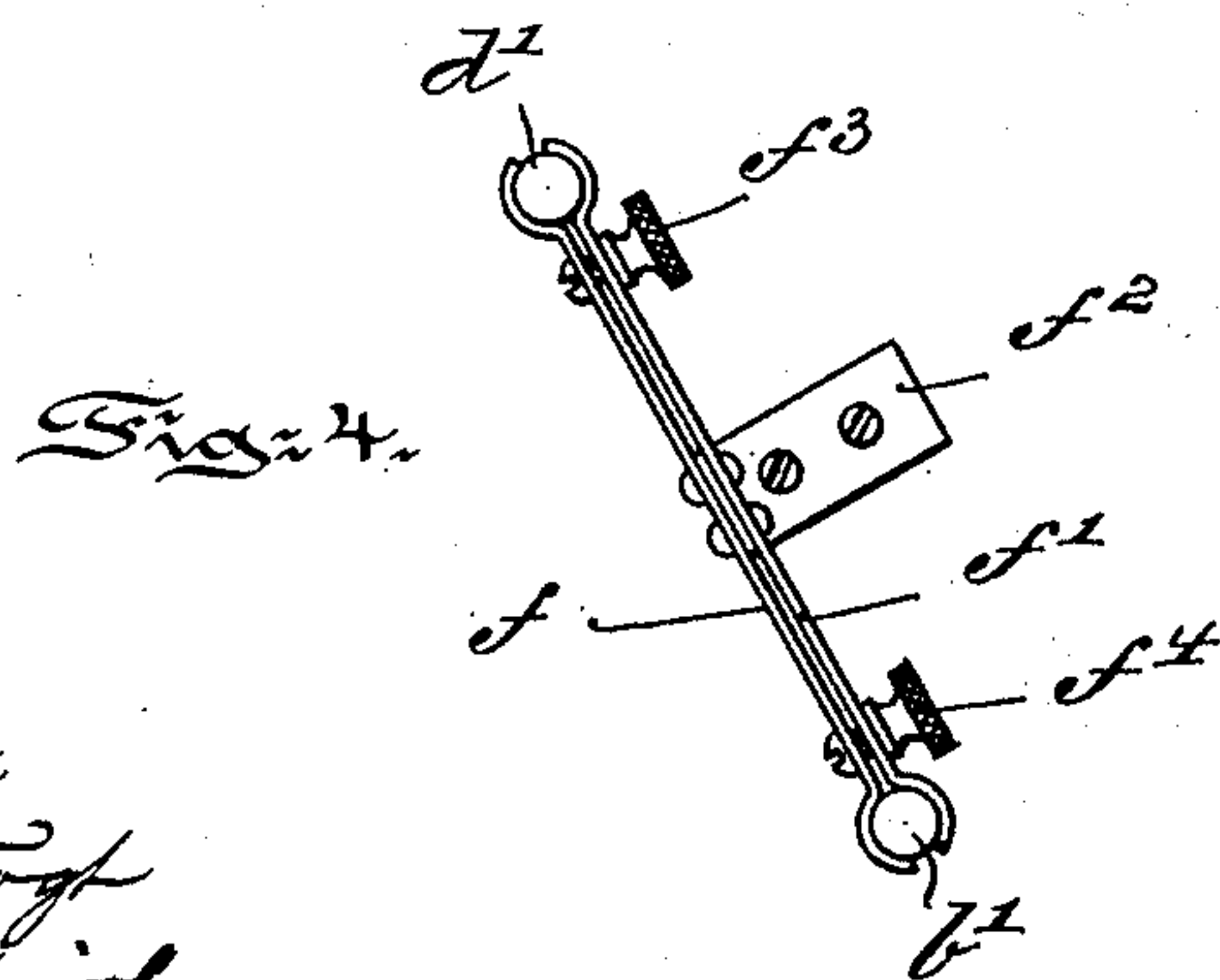
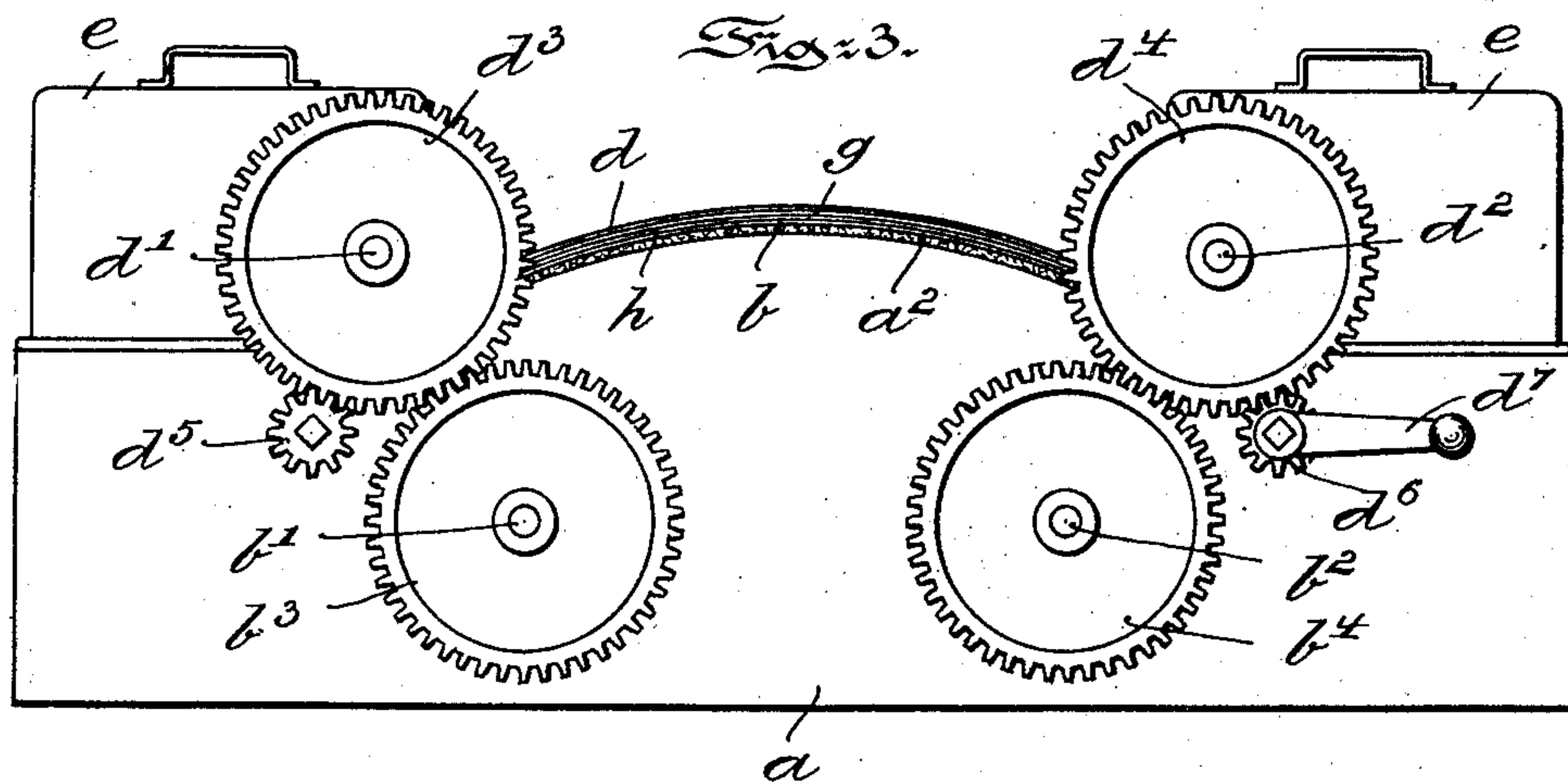
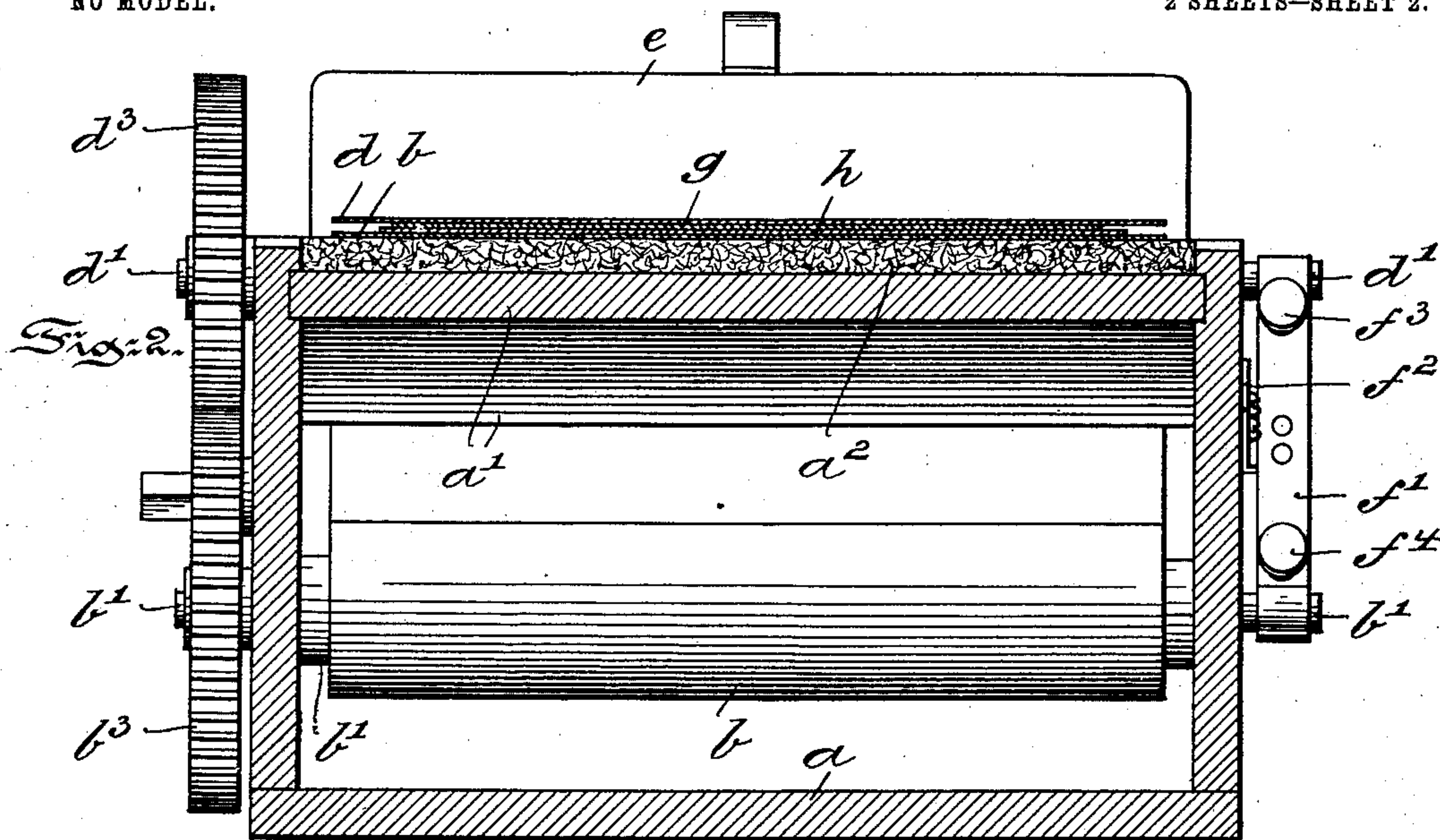
Inventor:
Nathaniel H. Brown,
by J. Walter Douglas
Attorney.

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UNITED STATES PATENT OFFICE.

NATHANIEL H. BROWN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF, HENRY S. WILLIAMS, AND MORRIS EARLE, OF PHILADELPHIA, PENNSYLVANIA, TRADING AS WILLIAMS, BROWN & EARLE.

PHOTOGRAPHIC-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 721,011, dated February 17, 1903.

Application filed December 9, 1902. Serial No. 134,484. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL H. BROWN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Photographic-Printing Apparatus, of which the following is a specification.

My invention has relation to an apparatus for printing from flexible transparent or semi-transparent films upon sheets of sensitized material—such, for instance, as blue-print or photographic sensitized paper or cloth; and in such connection it relates to the construction and arrangement of elements constituting such an apparatus for said purposes.

The principal objects of my invention are, first, to provide in an apparatus for blue-printing or similar operations, in conjunction with the bed or support of the apparatus, two parallel aprons or conveyers, between which the flexible transparent or semitransparent film and the sensitized sheet are fed in combination with means for causing the aprons to travel in the same direction across the bed of the apparatus to feed the film or transparent sheet and sensitized sheet across said bed; second, to provide in such an apparatus, in conjunction with the two parallel aprons or conveyers and means for moving the said aprons in the same direction, of a curved or arched bed for the apparatus, across which the aprons are adapted to travel, said bed forming a support for the lowermost of said aprons, and, third, to provide in such an apparatus an upper transparent apron or conveyer, two feed-rollers controlling said upper apron, a lower apron or conveyer, and two feed-rollers controlling the lower apron, in conjunction with a tension device connecting a feed-roller of the upper apron with a corresponding feed-roller of the lower apron, whereby the sets of feed-rollers and the two aprons may travel in unison.

The nature and scope of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a longitudinal sectional view of a blue-printing apparatus embodying main features of my invention. Fig. 2 is a vertical central sectional view of the same. Fig. 3 is a side elevational view of the apparatus, this view being on a smaller scale; and Fig. 4 is a side elevational view of one form of tension device for the feed-rollers of the apparatus.

Referring to the drawings, *a* represents the base of the apparatus, which base, by preference, is in the form of a box. This base *a* supports the bed *a'* of the apparatus, and, by preference, the bed or support *a'* is curved or arched and supports a layer *a²* of resilient material, such as felt or the like. Over the layer *a²* upon the bed *a'* is adapted to travel an apron or conveyer *b*, which, by preference, consists of a long strip of flexible material, such as muslin or the like. One end of the strip *b* is arranged to be wound upon or unwound from a roller or shaft *b'*, and the other end of the strip *b* is likewise arranged to be wound upon or unwound from a second roller or shaft *b²*. Arranged parallel with the conveyer *b* and above the same is a transparent apron or conveyer *d*, which, by preference, is secured at one end to a roller *d'* and at the other end to the roller *d²* and adapted to be wound upon or unwound from either roller, as required, in the same manner as is the conveyer *b*. A shield or box *e*, of preferably metal or similar non-transparent material, is removably secured to the top of the box *a* at either end of the apparatus, so as to cover, respectively, the roller *d'* or roller *d²* and the strip of material *d*, wound upon said rollers *d'* or *d²*. The conveyers *b* and *d* are so arranged as to travel in the same direction across the bed *a'* of the apparatus, and for this purpose at one side of the apparatus upon the roller-shafts *d'* and *b'* are arranged gears *d³* and *b³*, meshing together, and upon the other roller-shafts *d²* and *b²* similar gears *d⁴* and *b⁴* are arranged so as to mesh. A pinion *d⁵* or *d⁶* serves when turned by a handle *d⁷* to actuate either the gear *d³* or the gear *d⁴* to cause the two rollers *d'* and *b'* or *d²* and *b²* to turn in unison. The winding up of the conveyers *b* and *d* upon

one set of rollers— d' and b' , for instance—causes the conveyers b and d to unwind from the other set of rollers d^2 and b^2 , and also causes said rollers d^2 and b^2 , with their gears d^4 and b^4 , to turn. To regulate the motion of those rollers and gears which are not positively actuated, a tension device of the preferred form (illustrated in Figs. 2 and 4) may be employed. This device consists of the two spring-plates f and f' , arranged to surround at either end the shafts d' and b' or d^2 and b^2 . The plates f and f' are secured together at their middle by a bracket f^2 , which in turn is secured to the side of the box a . The tension-screws f^3 and f^4 serve to clamp the plates f and f' more or less tightly upon the shafts d' and b' or d^2 and b^2 to increase or decrease the tension upon said shafts.

In operating the apparatus the flexible transparent or semitransparent sheet or film g , from which the print is to be made, and a sheet h of sensitized material are first arranged so that the film g is above the sheet h . The two sheets g and h are then introduced at either end of the apparatus beneath one or the other of the removable shields e and between the two aprons or conveyers b and d . Motion is then transmitted to the conveyers b and d , which by friction carry the film g and sheet h across the bed a from one shield e to the other shield e at a uniform or substantially uniform speed of travel. The movement of the conveyers b and d may be regulated to the speed required, so that when the sheet h and film g have traversed the bed a the printing will be accurately accomplished.

The lower or upper conveyers b and d may, if desired, be in the form of an endless belt without departing from the spirit of my invention.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described, in combination with a bed of two parallel conveyers between which a transparent or semitransparent film and a sensitized sheet are arranged to be introduced,

and means for causing both conveyers to travel in the same direction across said bed to feed or move said film and sensitized sheet.

2. In an apparatus of the character described, in combination with a curved bed, of two parallel conveyers between which a film and sensitized sheet are arranged to be introduced, and means for causing both conveyers to travel in the same direction across said bed.

3. In an apparatus of the character described, in combination with a stationary bed, of two parallel traveling conveyers between which a film and sensitized sheet are arranged to be introduced, and means for causing both conveyers to travel in the same direction across said bed and at a substantially uniform speed of travel.

4. In an apparatus of the character described, in combination with a stationary curved bed, of two parallel conveyers, whereof one is of a substantially transparent nature, and between which conveyers the film and sensitized sheet are arranged to be introduced, and means for causing both conveyers to travel in the same direction across said bed.

5. In an apparatus of the character described, a base having a bed, a layer of resilient material arranged in said bed, a conveyer arranged to travel over said layer, a second conveyer of substantially transparent material arranged in parallel relationship with the first conveyer and above said layer, and means for causing both conveyers to travel in the same direction across the layer.

6. In an apparatus of the character described, an upper substantially transparent apron, two feed-rollers controlling said upper apron, a lower apron and two feed-rollers controlling said lower apron, in combination with a tension device connecting one of the feed-rollers of the upper apron with a corresponding feed-roller of the lower apron.

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

NATHANIEL H. BROWN.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.