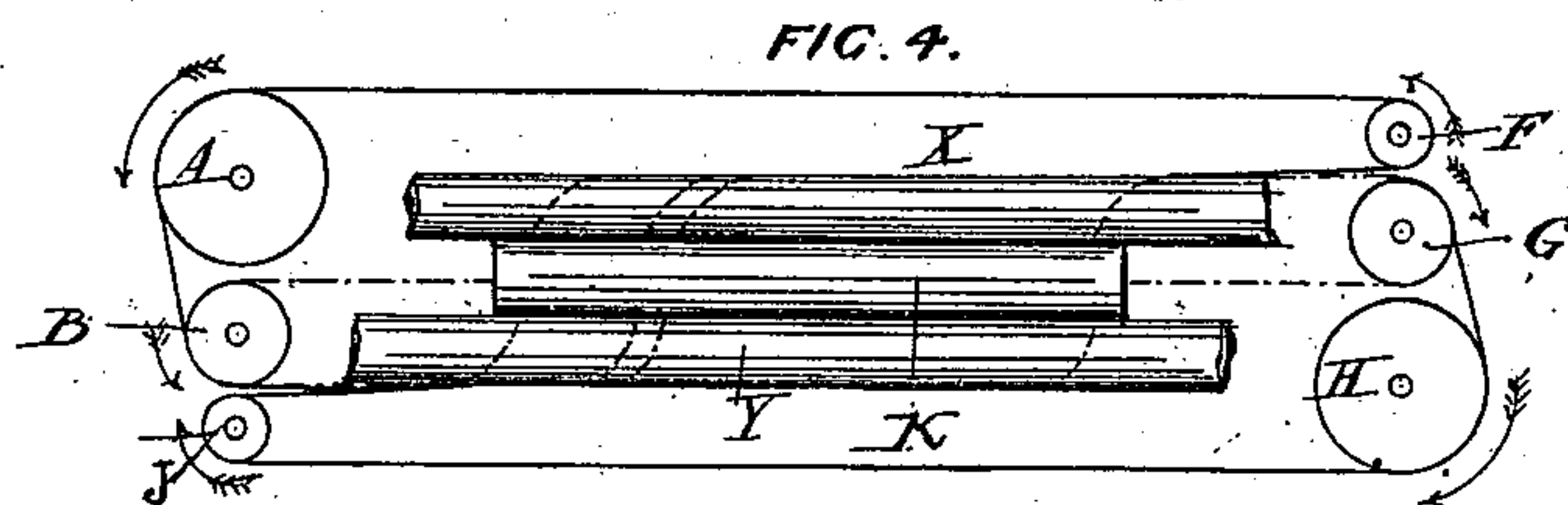
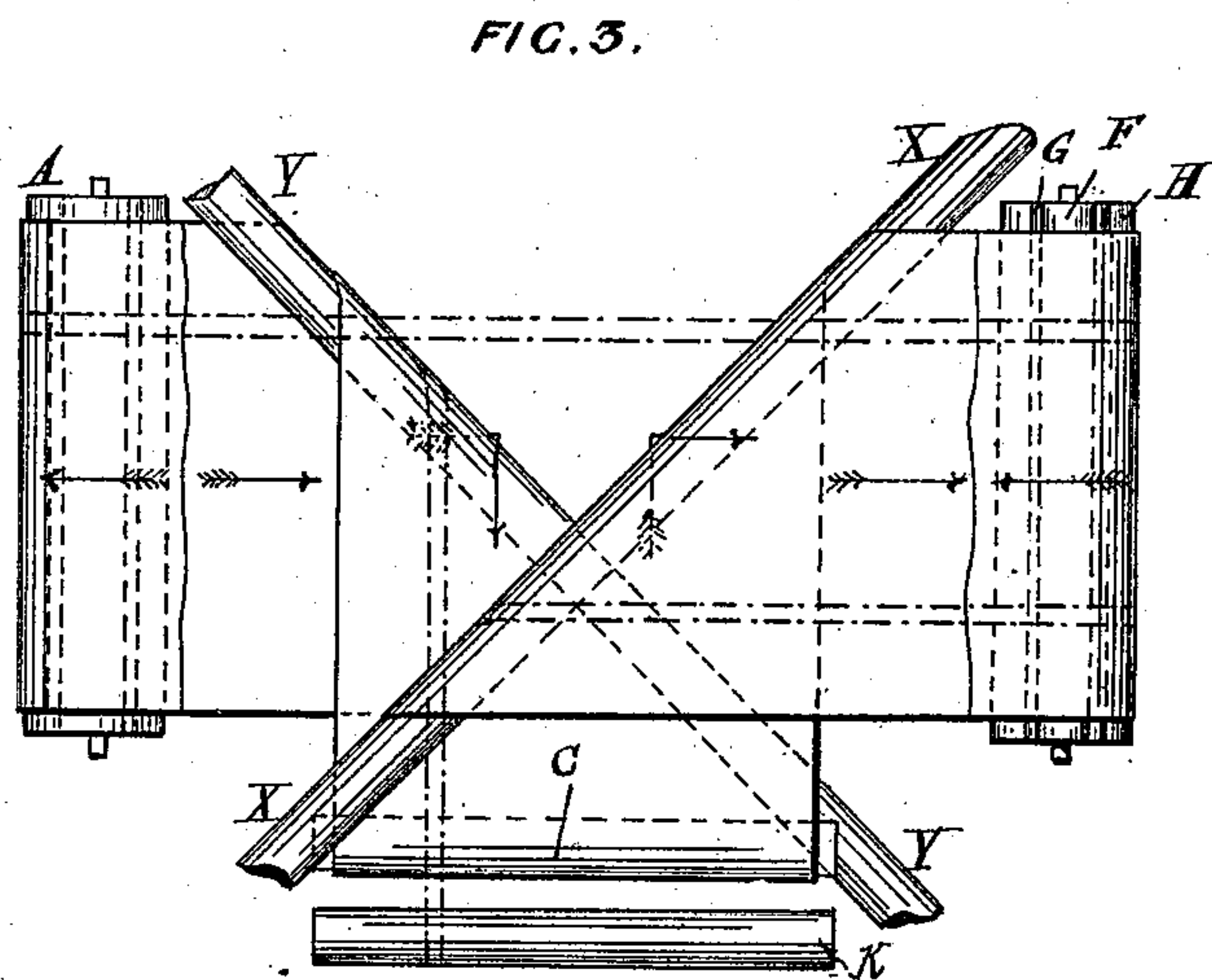
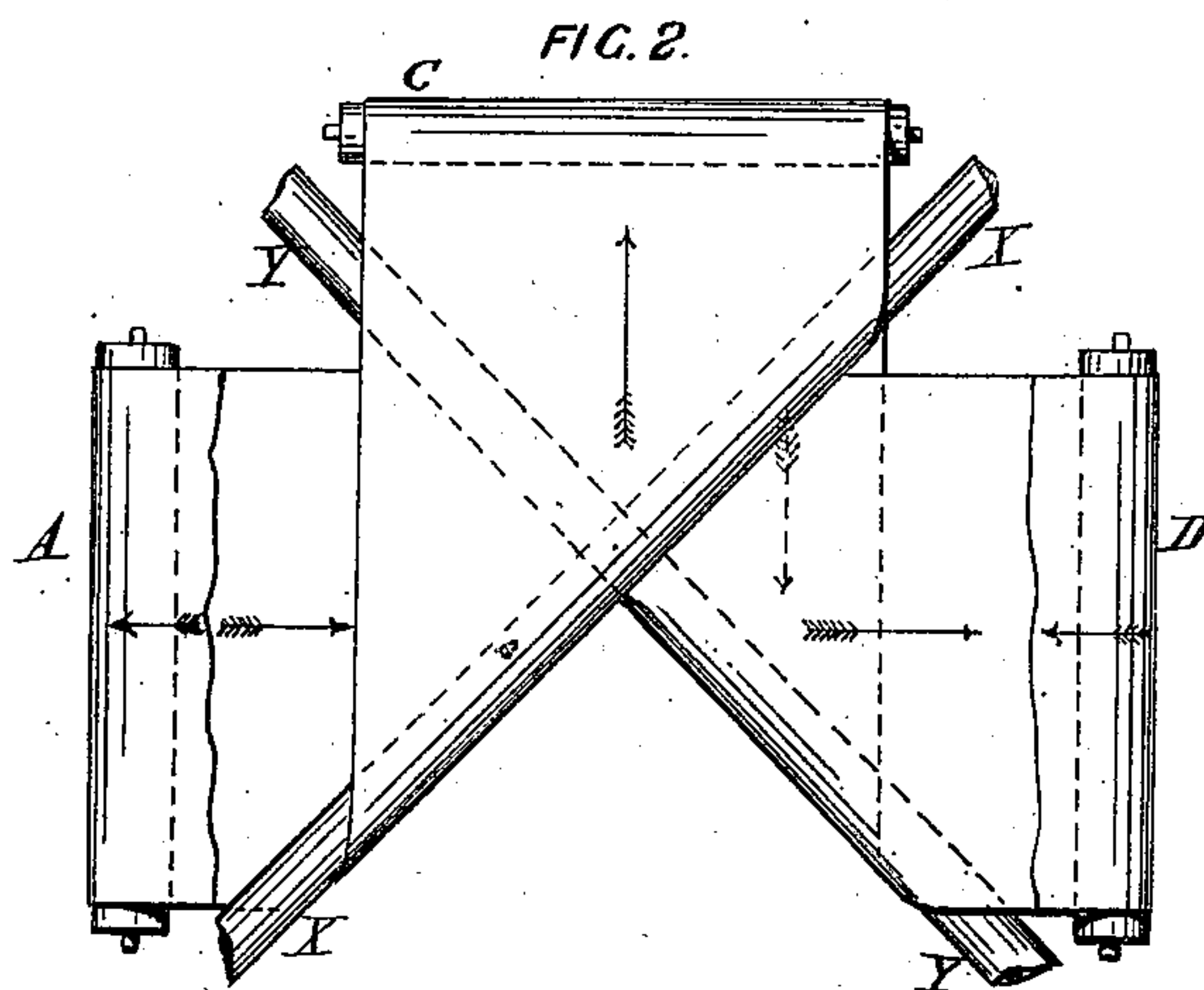
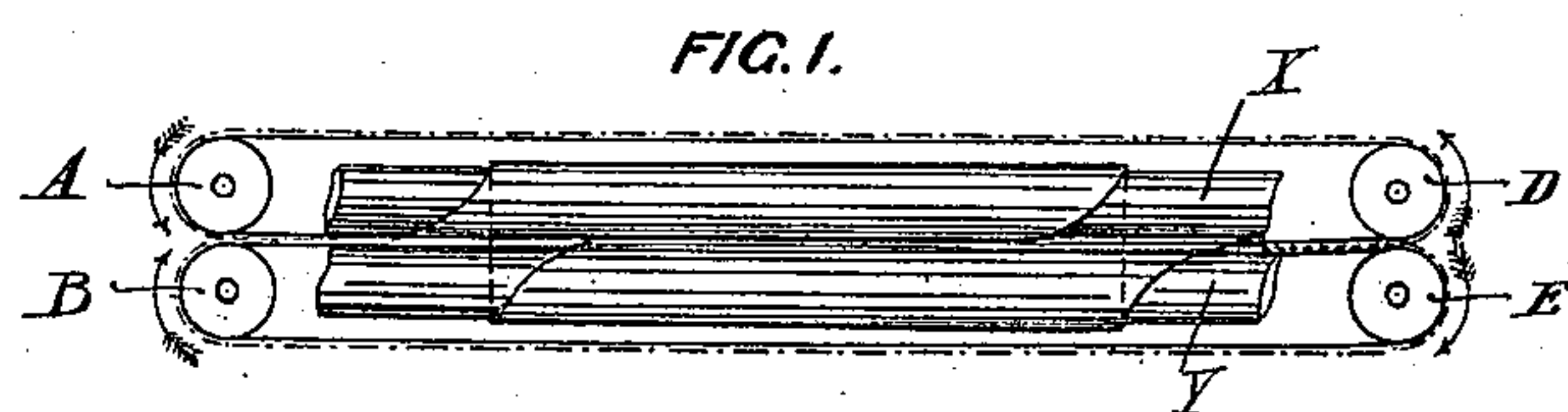


(No Model.)

W. W. TAYLOR.  
PRINTING MACHINE.

No. 300,162.

Patented June 10, 1884.



Witnesses  
David S. Williams  
Harry L. Ashenfelter.

Inventor:  
Wm. W. Taylor  
by his attys.  
Howson & Sons



# UNITED STATES PATENT OFFICE.

WILLIAM WILBERFORCE TAYLOR, OF RIPON, COUNTY OF YORK, ENGLAND.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 300.162, dated June 10, 1884.

Application filed August 6, 1883. (No model.) Patented in England November 17, 1882, No. 5,474.

*To all whom it may concern:*

Be it known that I, WILLIAM WILBERFORCE TAYLOR, a subject of the Queen of Great Britain, and residing at Ripon, county of York, England, have invented certain Improvements in Printing-Machines, (for which I have obtained a patent in Great Britain, No. 5,474, dated November 17, 1882,) of which the following is a specification.

My invention relates principally to the class of printing-machines described in the specification of British Letters Patent No. 1,127, granted to Edwyn Anthony and myself, as of the 27th day of March, in the year of our Lord 1875, and has for its objects to afford a more perfect means for carrying the web of paper to be printed over the guiding or turning surfaces or rollers, by which the paper is turned or twisted in the required direction.

In carrying out my said invention I provide an additional web or webs or tape or tapes, which is or are arranged to act as a carrier or support for the tape or tapes by which the paper is carried around the guiding or turning surfaces and rollers; and I may carry the tapes or webs up over additional rollers or surfaces, so that guides may be arranged for each tape or web clear of the paper; and guides may also be arranged beneath for the same purpose, if desired.

Figures 1 and 2 represent, diagrammatically, in elevation and plan, respectively, an arrangement according to my invention for carrying the web of paper to be printed upon over the guiding or turning surfaces or bars by which the paper is turned or twisted in the required direction. In both these diagrams, X Y represent two cylinders of any suitable diameters—by preference of diameters equal to each other—fixed at right angles to one another, and with any required distance between them. A B D E are rollers parallel to one another, and each making an angle of forty-five degrees with the cylinders X Y. The under surfaces of the rollers A D are flush with the under surface of the cylinder X, and the upper surfaces of the rollers B E are flush with the upper surface of the cylinder Y. The rollers A and D are nearly in contact with the rollers B and E, and serve only to carry tapes

or webbing. They can consequently be discontinuous, provided only that the portion requisite to carrying the tapes or webbing exist. C represents one of two rollers arranged at right angles to the rollers A B D E, and making an angle of forty-five degrees with each of the cylinders X Y. These rollers C are parallel to one another, fixed so that the upper surface of the one and the under surface of the other are made to come flush with the upper and under surfaces of the cylinders X and Y, respectively; or a single roller can be substituted for these rollers, provided its upper and lower surfaces take the same positions that the upper and lower surfaces of the two rollers C would take, as described above. It is unnecessary for the angles which the rollers A B D E make with the cylinders X Y to be angles of forty-five degrees; but they must be parallel to each other, and the rollers C must make the same angle with the cylinders X Y that the rollers A B and D E do; but the rollers A B and D E will not then be at right angles to C. The point of shortest distance between the cylinders X and Y is nearer to the roller C than the middle line of the natural course of the web of paper, (as described in the specification of the said Patent 1,127, in the year of our Lord 1875.) The diameters of the rollers B and D must be a little greater than the diameters of the cylinders Y and X, respectively. The diameters of the rollers E and A must be greater than the diameters of the cylinders Y and X, respectively, by a little more than the distance between the said cylinders Y and X. As in the case of the roller C, so in the cases of the rollers A B D E two parallel rollers may be used instead of one in each case, and then the only consideration would be that the tapes, web or webbing, or paper passing over them must not interfere with, or be interfered with by, other parts of the machines. In this apparatus the ordinary tapes are carried by other tapes, which I call the "carrying-tapes." The carrying-tapes pass from D to A, round A, under and round X, over and round and under C, under and round Y, round E and B, and straight through between X and Y, to go round D. After repeating this course the tape will meet itself again, but not before, except in the case of the center tape, which



will only go through the course once. The ordinary system of tapes, or the carried tapes, pass from D to A, round A, under and round X, over and round and under C, under and round Y, round E and B, under and round X, over and round and under C, under and round Y, round D, to the point where it started. There will be two such tapes for each carrying-tape, except the center one, which will only have one, and the carrying-tapes will save these ordinary tapes from friction against the cylinders X and Y. The carrying-tapes must be driven at some point of their motion. The ordinary tapes may or may not, according to pleasure, pass through the rest of the machine before returning into themselves. The tapes above described can each individually be of any width desired, and may be made a continuous web or webbing, on the one hand, and the remarks about center tapes would apply to such web or webbing, or, on the other hand, might be reduced to threads or fine cords, in which case, as probably in others, it would be advisable for there to be grooves made in the rollers and turning cylinders for them to take into. Any number of guides can be arranged for the tapes above or below the apparatus between A and D and B and E, and also in the middle, if necessary, between B and D.

Figs. 3 and 4 are diagrams representing, in plan and elevation, another arrangement similar to that described with reference to Figs. 1 and 2. The directions of A B J F G H obey the same rules as the directions of A B D E in Figs. 1 and 2, the directions of X Y being the same as those of X Y in the first case, and the directions of C and K the same as those of C. The under surface of B must be flush with the under surface of Y, the upper surface of Y within a trifle flush with the under surface of C and K, the upper surface of C and K within a trifle flush with the under surface of X, the axes of C and K being exactly half-way between X and Y, the small margin left between C and K and X and Y being to allow of the passage of the tapes and paper, and depending on the thickness of these being equal to that combined thickness or less, according as grooves are or are not sunk on the rollers C and K for the tapes or their equivalents. In place of C it may be necessary to substitute two rollers—one on the side of C remote from K, and covered by continuous blanketing to prevent set-off. The upper surface of X must be flush with the upper surface of G. The rollers J and F, C and K may be of any convenient diameter. The diameter of B must be greater than that of Y and less than those of Y and C combined. The diameter of G must be greater than that of X and less than those of X and C combined. The diameter of A must be greater than  $x+y+c-b$ , and the diameter of H greater than

$x+y+c-g$ , where the small letters  $x y c b g$  stand for the diameters of X Y C B G, respectively. In this apparatus the course of the paper, tapes, and carrying-tapes is between B and J, under and round Y, under and round C, (the carrying-tapes can here be separated from the rest and taken round K, and provided with guides between C and K,) under and round X, and out between F and G. The carrying-tapes would then pass through between G and H, and through the middle of the apparatus between A and B, round B to meet themselves. After describing this course twice the other tapes issue from between F and G—some below and some above the paper. Those above the paper travel across the top of the apparatus round A and B, and, traveling through again on the other side of the paper, issue at G below the paper. They now belong to the second class, and travel round G and H, back round J, and meet themselves where they originally started. The same remarks as to number of tapes and center tapes and the substitution of webbing for tapes apply to this case as in the first case. In each case tapes can be supplied with guides at any part of their return motion where free from the paper—i. e., at the top of apparatus, at the middle, or at the bottom. The effect of the paper passing through this apparatus is the same as in the case of the first-described arrangement; but the advantage derived is that the travel of the paper can be made considerably shorter, owing to the fact that C can be carried in between X and Y.

I claim as my invention—

1. In a printing-machine, the combination of bars and rollers for turning and guiding the paper, and the ordinary carrying-tapes, or equivalent, with a web or tapes to support the said ordinary tapes, substantially as set forth.
2. In a printing-machine, the combination of bars having inclined turning-surfaces at right angles to each other, and guiding-rollers and carrying-tapes, or equivalent, for the paper, with a carrying web or tapes to support the said ordinary tapes, substantially as set forth.

3. The combination of bars X Y, having inclined turning-surfaces at right angles to each other, with rollers A B C D E, tapes passing around said rollers, to carry the paper, and a carrying-web or tapes to support the said ordinary tapes, and also passing round said rollers, substantially in the manner set forth.

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

WILLIAM WILBERFORCE TAYLOR.

Witnesses:

ARTHUR BROOKE HASLAM,  
Bishopton Close, Ripon.  
ROBERT GOETZ,  
Fishergate, Ripon.