

W. SCOTT.
Sheet Delivery Apparatus for Printing Machines.
No. 237,413. Patented Feb. 8, 1881.

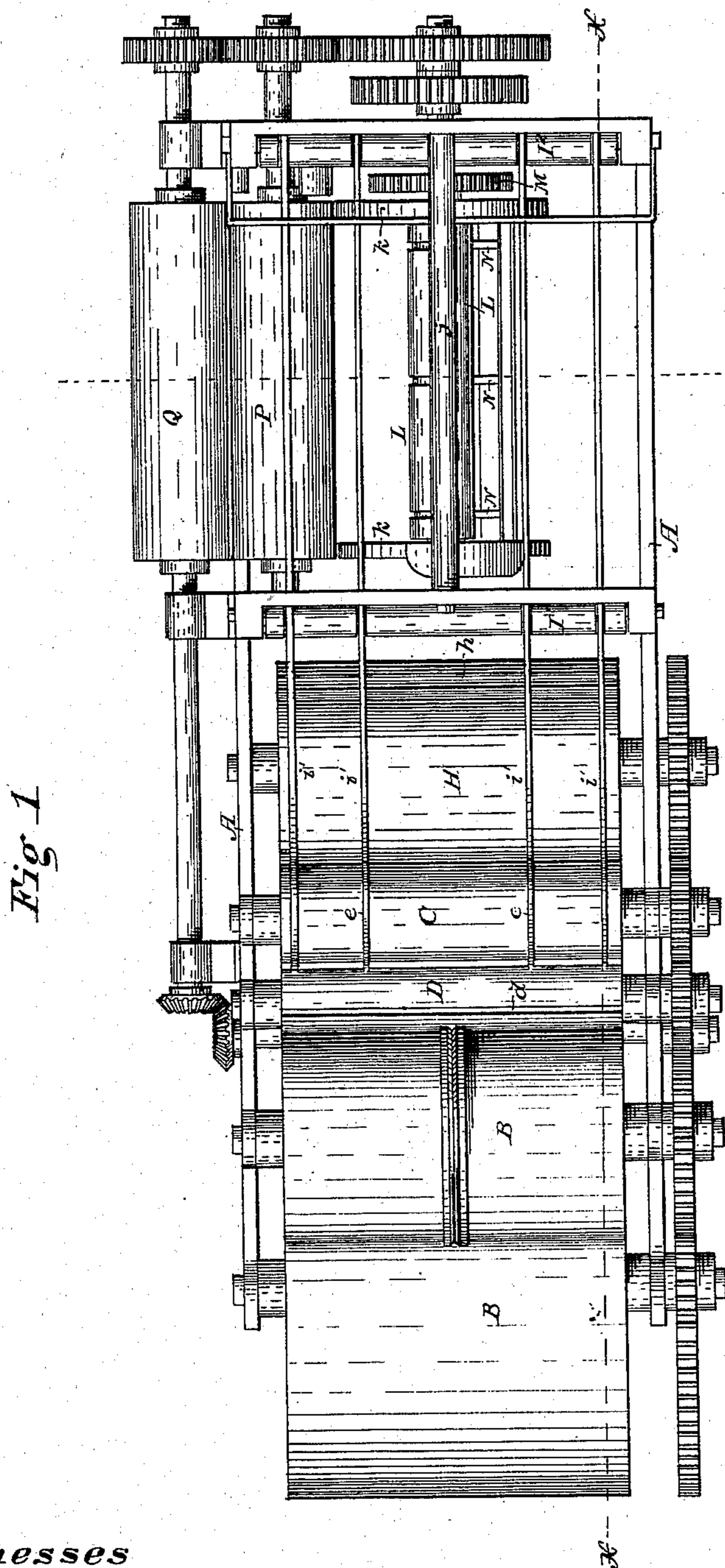


Fig 1

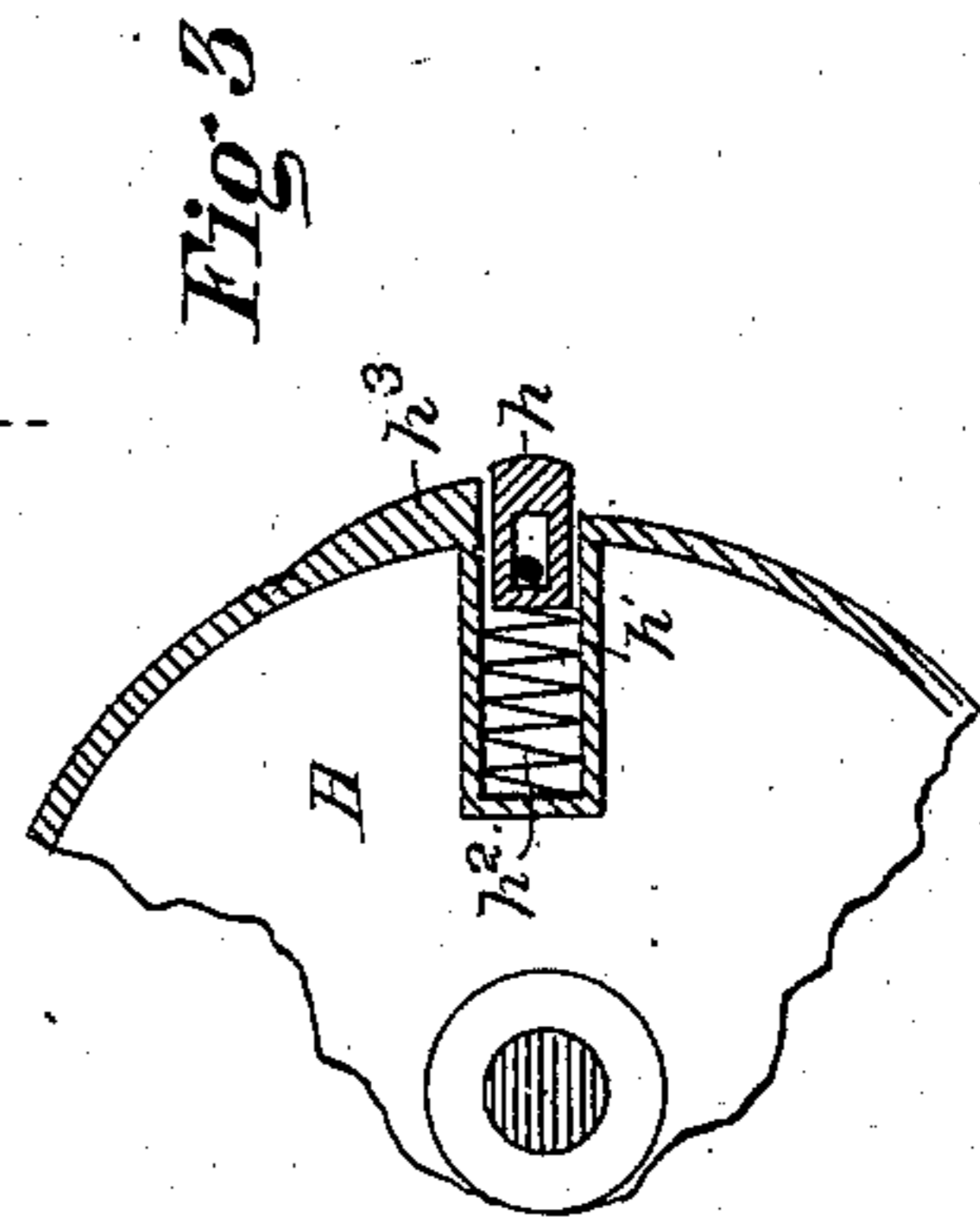


Fig. 3

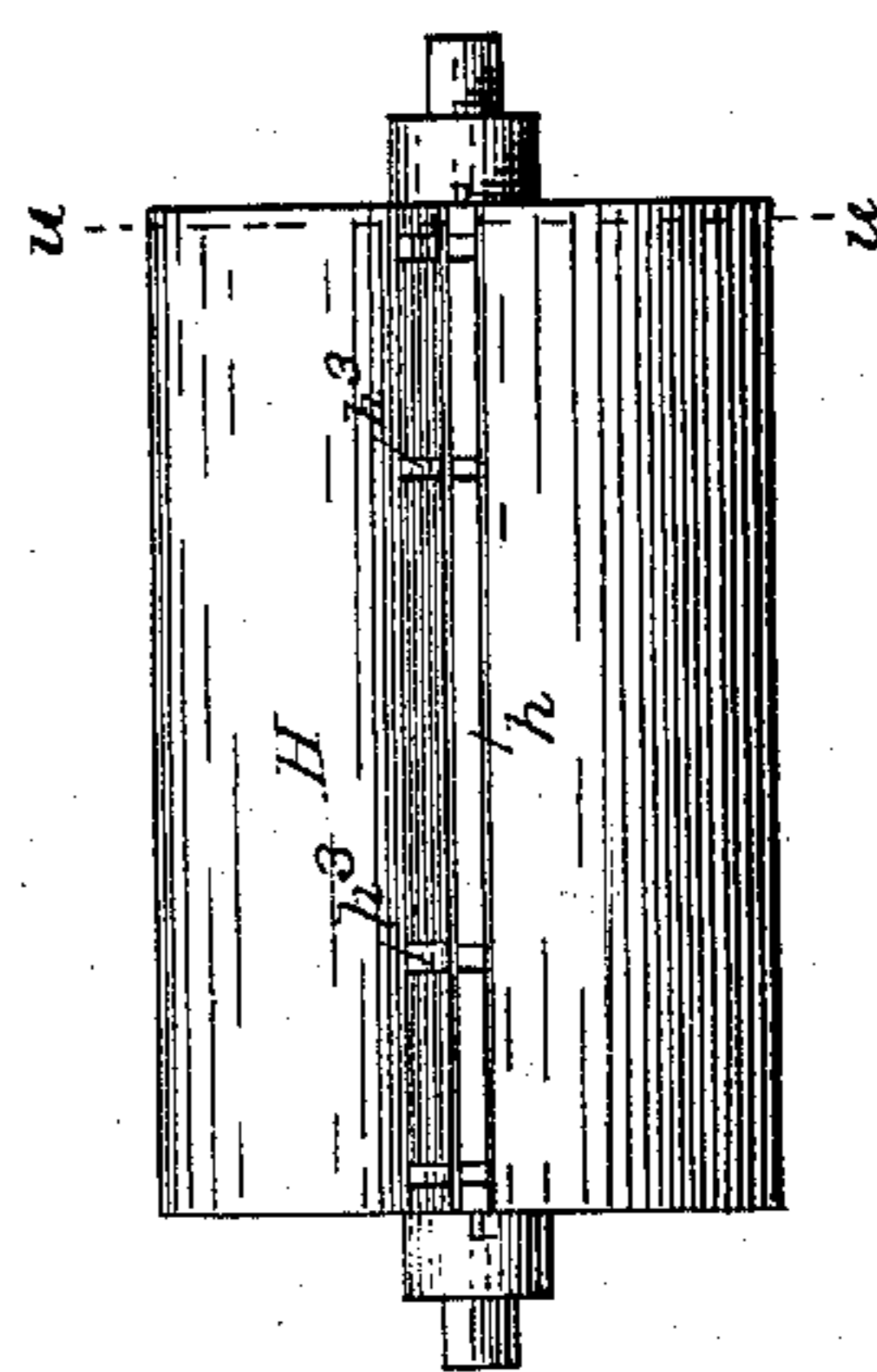


Fig 2.

Witnesses

W. C. Corlies
C. Clarence Poole

Inventor

Walter Scott
By *Coburn & Thacher*
Attorneys

W. SCOTT.

Sheet Delivery Apparatus for Printing Machines.
No. 237,413. Patented Feb. 8, 1881.

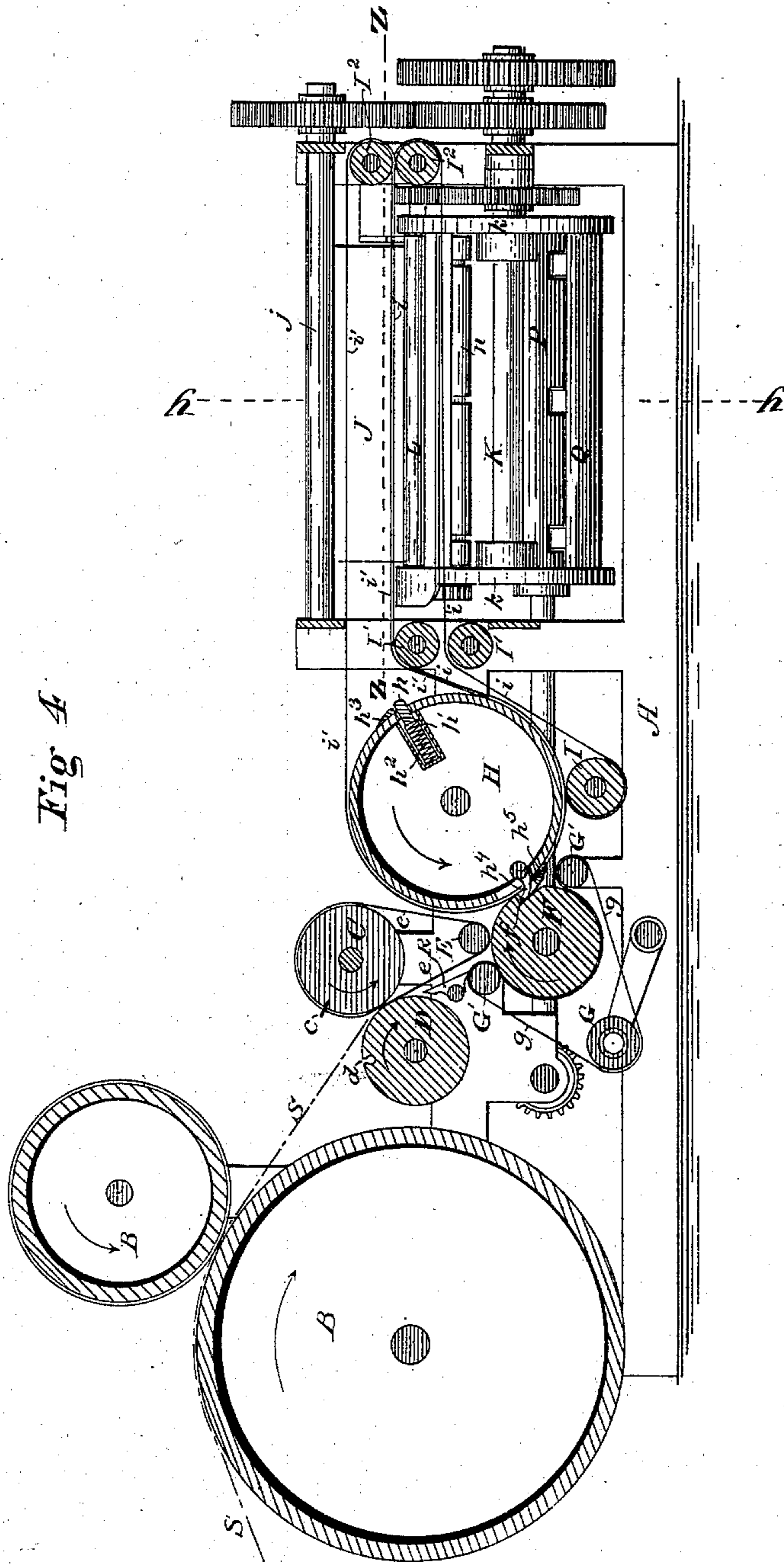


Fig. 4

Witnesses

W. C. Cortis
C. Clarence Poole

Inventor

Walter Scott

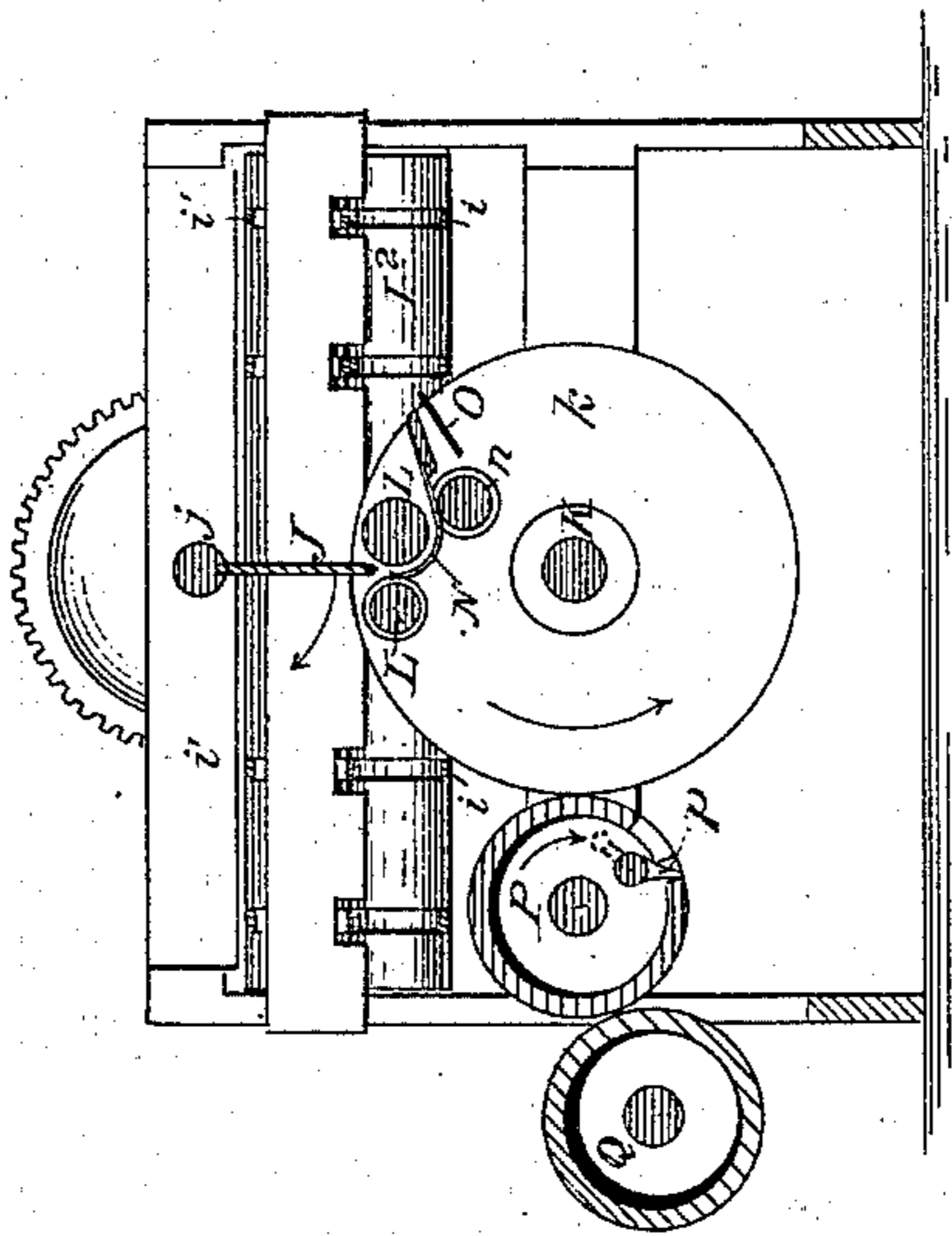
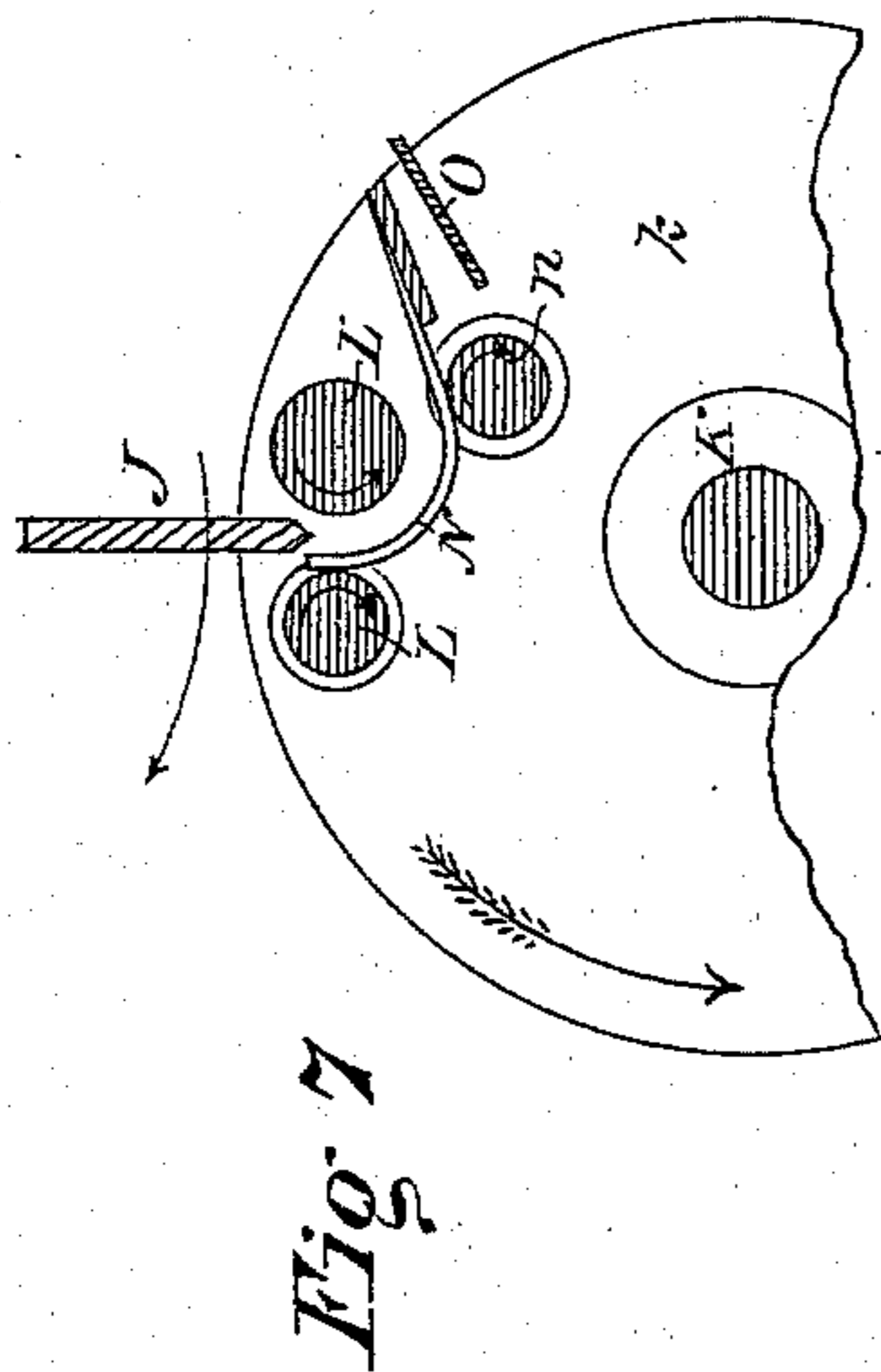
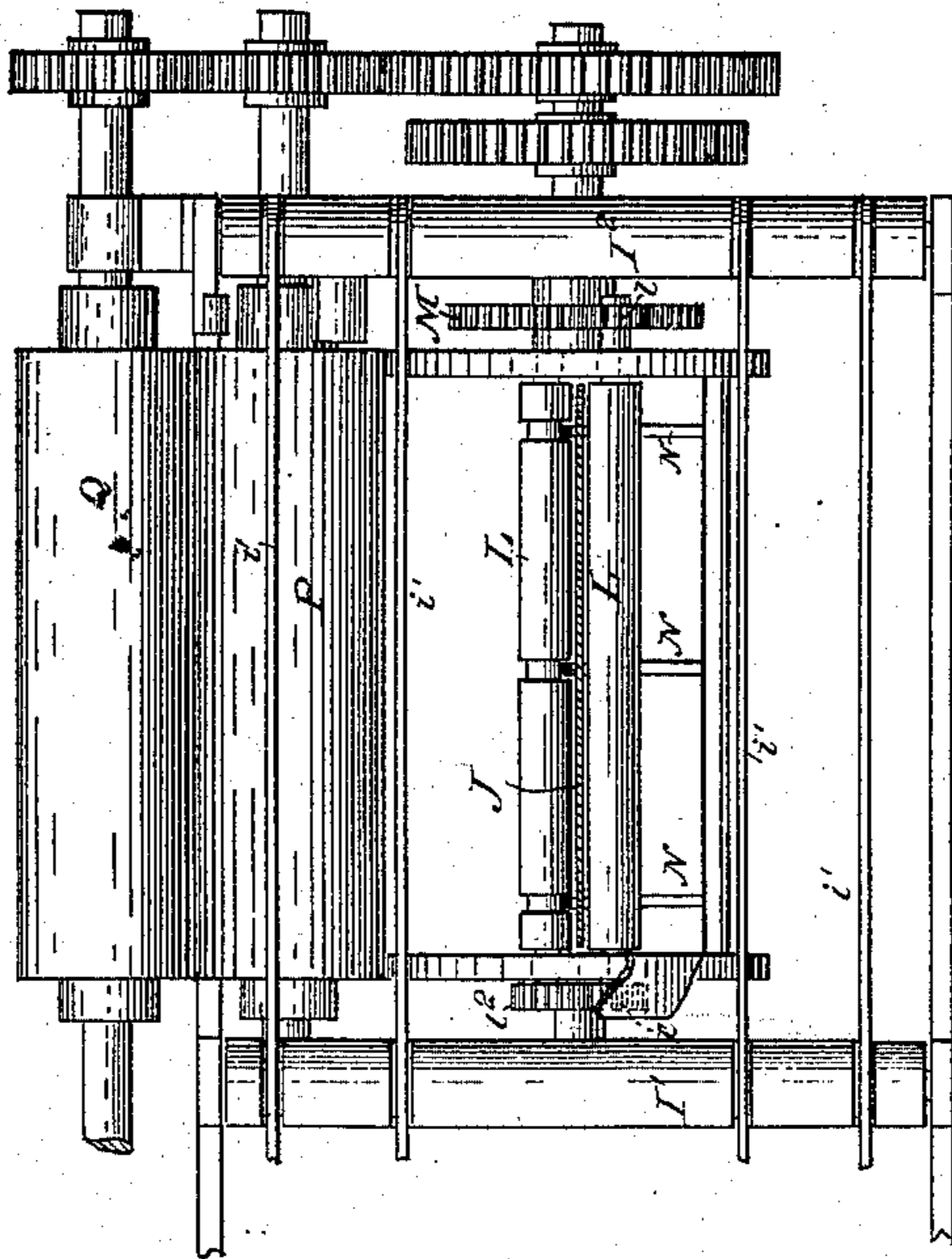
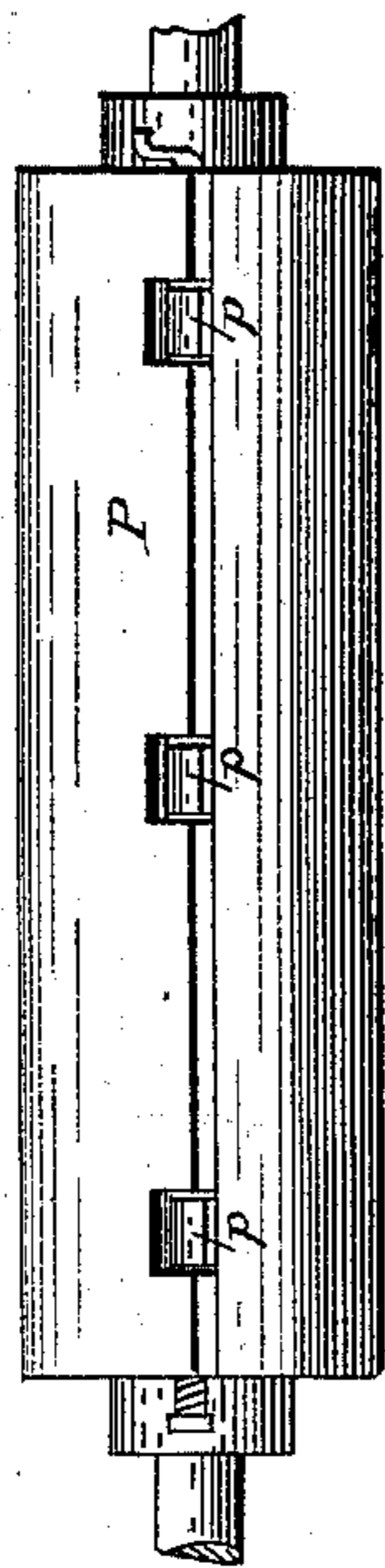
By *Robert Thacher*
Attorneys

W. SCOTT.

Sheet Delivery Apparatus for Printing Machines.
No. 237,413. Patented Feb. 8, 1881.

No. 237,413.

Patented Feb. 8, 1881.



Witnesses

W. C. Corlies

C. Clarence Poole

Inventor.

Walter Scott

By Colman & Thacher
Attorneys

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 237,413, dated February 8, 1881.

Application filed January 31, 1880.

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sheet-Delivery Apparatus for Printing-Machines, which are fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of a machine embodying the improvements; Fig. 2, a side elevation of the transferring-cylinder detached; Fig. 3, a detailed transverse section of a portion of said cylinder, taken on an enlarged scale on the line *u u*, Fig. 2; Fig. 4, a vertical section taken on the line *x x*, Fig. 1; Fig. 5, a transverse section taken on the line *y y*, Fig. 4; Fig. 6, a plan section taken on the line *z z*, Fig. 4; Fig. 7, a transverse section, on an enlarged scale, of the folding-cylinder shown in Fig. 5; Fig. 8, a side elevation of the folding gripping-cylinder detached.

My invention relates to machines in which a perfecting-press is employed, and to which a folding machine is attached for folding the sheets as they are delivered from the press, the object of this present invention being to provide means for collecting two or more sheets upon a cylinder and transferring them from said cylinder to folding mechanism, by means of which the required number of folds are given to the signature.

The invention consists in special mechanisms and combinations of devices relating to the collecting and transferring portion of the machine.

It also consists in special mechanisms and combinations of devices referring to the folding portion of the machine.

All of these special devices will be hereinafter fully described, and the particular improvements which are claimed to be new pointed out definitely in the claims.

In the drawings, A represents the main or supporting frame of the machine, in which the various devices are mounted, and B B the last set of printing-cylinders belonging to the press. Only these last printing-cylinders are shown, as the invention is not restricted to any particular kind of web-press, but may be employed with any well-known perfecting printing-machine.

Cutting-cylinders C and D are mounted in suitable position in the rear of the printing-cylinders, the former being provided with a cutting or perforating blade, *c*, and the latter with the ordinary cutting-groove *d*, by means of which the sheets are either severed or perforated, as either a cutting-blade or a perforator is used. Immediately below the knife-cylinder C is a small tape-roller, E, and a set of tapes, *e*, are arranged to run around this latter roller and the cutter-cylinder C. Below this tape-roller E is arranged a collecting-cylinder, F, which is of the same circumference as the cutting-cylinders, and is provided on one side with a longitudinal recess, *f*.

A little below and in front of the collecting-cylinder is a tape-roller, G, which is mounted in an ordinary way in vibrating arms for the purpose of adjustment. Two tape-rollers, G', are arranged, one above and on the front side of the collecting-cylinder, and the other in the rear thereof and in a lower plane, as shown in Fig. 4 of the drawings. A series of tapes, *g*, are arranged to run around these three tape-rollers and underneath and in the rear of the collecting-cylinder, as shown in Fig. 4.

A transferring-cylinder, H, is mounted in the rear of the cutting and collecting cylinders, with the latter of which it runs in contact. This cylinder is provided on one side with a movable bar, *h*, arranged in a longitudinal recess, *h'*, within the cylinder, with springs *h*², arranged within said recess. Obviously this bar will therefore be yielding in the direction of the radius of the cylinder, and the springs are so constructed that unless compressed the bar will be projected slightly beyond the surface of the cylinder. Just in front of the bar are a series of projections or breakers, *h*³, the rear ends of which are straight or perpendicular and the outside surfaces of which incline forward. Ordinary transferring-grippers *h*⁴ are also attached to this cylinder, arranged on the side thereof opposite to the yielding bar, and in front of these grippers is another series of projections or breakers, *h*⁵, like those in front of the bar.

Immediately below the transferring-cylinder is an ordinary tape-roller, I, and just in the rear of the same cylinder is a pair of similar rollers, I', and at the rear end of the machine still another pair of similar rollers, I², arranged

a little higher than the former pair, so that the lower roller of the rear pair is about in the same plane with the upper roller of the front pair. A series of tapes, *i*, is arranged to run around the roller I, the upper roller I', the lower roller I², and over the lower roller I' on its return. A second series of tapes, *i'*, is arranged to run around the transferring-cylinder, over the upper roller I', and around the upper roller I².

In the rear portion of the frame is mounted a creasing-blade, J, which is attached to a shaft, *j*, arranged lengthwise in the direction of the movement of the tapes *i* *i'*, above which it is located. Immediately below this creasing-blade is a revolving carrier, consisting of a shaft, K, and disks or arms *k*, rigidly attached thereto, the shaft being arranged parallel to the shaft of the creaser. A pair of ordinary folding-rollers, L, are mounted on these disks or arms, being arranged within the circumference of said disks, and at such a distance from the shaft K that the radius from the center of said shaft to the center of each of these rollers will be equal to the radius of the creaser J—that is, the distance from the center of the creaser-shaft to the edge of the blade, or nearly so. The gear-wheels on the shafts *j* and K are of the same size, so that the motion of the creaser-blade at its outer edge will be substantially the same as the motion of the rollers as they are carried around by the disks. An independent rotary motion is provided for each of these folding-rollers by means of a fixed gear-wheel, M, which is suitably mounted in the frame, and is concentric with the shaft K. The rear folding-roller is provided with a small pinion, *l*, which engages with the stationary gear M, and at its other end is provided with a second pinion, *l'*, arranged to engage with a similar pinion, *l*², on the other roller, L. Obviously as the rollers are carried around by the rotary carrier an independent rotation inwardly will be given to each.

A series of guides, N, are arranged below the rear folding-roller, the front ends of which are bent upward between the two rollers, and the rear ends of which extend outward to the periphery of the disks. Below these guides is an ordinary friction-roller, *n*, provided with grooves, within which the guides *n* rest, as shown in Fig. 7 of the drawings. In this Fig. 7 of the drawings, for the purpose of illustration, the rollers are represented as separated by a considerable space. In the actual machine, however, it will be understood that the folding-rollers run nearly in contact, as usual, so as to bite and carry forward the paper, and the friction-roller runs in the same relation to the rear folding-roller, to which it is geared, so as to receive a positive motion.

Just in the rear of the outer ends of the guides N is a creasing-blade, O, mounted on the carrying disks or arms and projecting slightly beyond their periphery, as shown in Fig. 7 of the drawings.

At one side of the revolving carrier is a cylinder, P, suitably mounted in the main frame and arranged parallel to the carrier. This cylinder is provided with ordinary spring folding-grippers *p*, which need not be described here, as their construction and function are well known.

A plain cylinder or roller, Q, is arranged outside of the gripper-cylinder P, with which it runs in contact, and operates to convey the sheet to any point desired. In this instance it is mounted on the driving-shaft arranged lengthwise of the machine, by means of which the folding mechanism is operated. A suitable guide, R, is arranged between the grooved cylinder D and the tape-roller, below and in front of the tapes *e*.

It will be understood that the cylinders and shafts above mentioned and described are provided with suitable gearing for giving them the required rotation in the direction indicated in some instances by arrows in the drawings. It is not necessary, however, to particularly mention and describe this gearing, as its construction and arrangement will be readily understood by those skilled in the art from the description of the movements which are required and the successive operations which it is intended to effect, and the description of the operation of the machine will sufficiently indicate the manner in which the gearing should be timed.

The operation of this machine is as follows: The printed web (shown by the dotted line S in Fig. 4 of the drawings) is delivered from the printing-cylinder to the cutting-cylinders, where it is severed or perforated into sheets in the usual way. The leading end of the first sheet is delivered between the tapes *e* and the guide R to the collecting-cylinder, and passes between the collecting-cylinder and the tape-roller E, being carried around by the collecting-cylinder. The several cylinders and rollers are so timed that the yielding push-bar *h* will be brought into contact with the collecting-cylinder immediately behind the recess therein just as the leading end of the sheet reaches this point, and when obviously the leading end of the sheet will be gripped between the bar and the cylinder, the former being forced backward into its recess by contact with the latter. As these two points of the cylinders separate, the bar, being thrust outward by the action of the springs, will still hold the end of the sheet to the collecting-cylinder until it has reached a point where it will be delivered to the tapes *g* running in contact with the collecting-cylinder, and will thus be held to and carried around with the collecting-cylinder until once more it is brought to the point of delivery from the cutting-rollers. At this time the leading end of the second sheet has reached the same point, and the two sheets are together carried around underneath the tape-roller E. When they are brought again into the bite between the collecting and trans-

ferring cylinders the transfer-grippers of the latter are in proper relation to seize the ends of the two sheets, thereby transferring them to the cylinder H. Of course, if the sheets are perforated only, it will be necessary at some point to separate or break them away. This is effected by the projections or breakers $h^3 h^5$ on the transferring-cylinder, operating in connection with the recess f in the collecting-cylinder, into which the projections pass and depress the rear ends of the sheets at the proper moment for separation, the first set operating just as the push-bar takes hold of the leading end of the following sheet, and the second set operating just before the grippers close for the purpose of seizing the ends of the collected sheets. The signature of collected sheets is now carried around by the transferring-cylinder, up between the latter and the tapes i running in contact therewith; and at some point between the commencement of said contact and the contact of the tapes of the rollers I' the transferring-grippers are released, and the signature is taken by the tapes $i i'$ and conveyed to the rear of the machine, directly underneath the creasing-blade J. When in proper position underneath this blade the signature is bent or creased by the blade J into the folding-rollers L, between which the folded or doubled sheet is carried down over the guides N between the rear folding-roller and the friction-roller n , by the operation of which it is carried outward to the periphery of the disks again, the leading end following backward over the second creaser, O. The movement of these parts is so timed that when about half the width of the folded sheet has been delivered over this creaser it is brought into position by means of the rotating carrier to bend or crease the sheet into the folding-grippers on the cylinder P, which are also brought into proper relation at this moment. A second fold, parallel to the first, is thus made by the action of the creaser O and gripper-cylinder P. The folded sheet is carried by the latter around between it and the cylinder Q, whereby it is delivered to other folding mechanism, or to any point which may be desired. In this operation it will be seen that, the centers of the folding-rollers L and the edge of the creaser J being on the same radius and moving at the same speed, the creaser and rollers operate in the same measure as the teeth of spur-gearing, so that a fixed creaser may be employed—that is, one which is not alternately thrust outward and retracted, as in some instances in machines heretofore known. It will also be seen that two parallel folds are given to the signature or sheet by using only

two cylinders or rotating carriers, both folds being made at the periphery or circumference of the said cylinders or carriers.

If it is desired to paste together the sheets composing the signature, a pasting-disk or any other suitable and well-known pasting mechanism may be arranged at any convenient point on the machine—for instance, so as to run in contact with the collecting-cylinder or with one of the cutting-cylinders, or at any other location where it will accomplish the desired result.

In the machine shown in the drawings, and above described, provision is made for collecting but two sheets. It is obvious, however, that by constructing the printing, cutting, collecting, and transferring cylinders with proper relation to each other three or more sheets may be collected upon the cylinder, instead of two, and transferred, as described, as a single signature, to the folding mechanism. In this machine the folding mechanism is arranged at right angles to the transferring mechanism, so that the two folds are made parallel with the direction in which the sheets are running; but the folding mechanism may be arranged parallel with the transferring mechanism and the sheets delivered in a well-known way, so that the folds will be made in the opposite direction, or at right angles to the direction in which the sheets are running.

I am aware that folding-rolls have heretofore been mounted in a revolving carrier and adapted to operate in connection with a creaser having a radial movement in relation to said carrier, and I do not claim, broadly, such a carrier with folding-rolls and a creaser.

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

1. The collecting-cylinder provided with the longitudinal recess f , in combination with the transferring-cylinder provided with a yielding push-bar, projections or breakers, and transferring-grippers, whereby two or more sheets are separated, collected on a cylinder, and transferred as a single signature, substantially as described.

2. The perforating-cylinders, in combination with the collecting-cylinder, the tapes e , the transferring-cylinder provided with a yielding push-bar, breakers, and transferring-grippers, and the tapes g , arranged and operating substantially as and for the purposes set forth.

WALTER SCOTT.

Witnesses:

EDMUND T. DAVIS,
DAVID E. TITSWORTH.