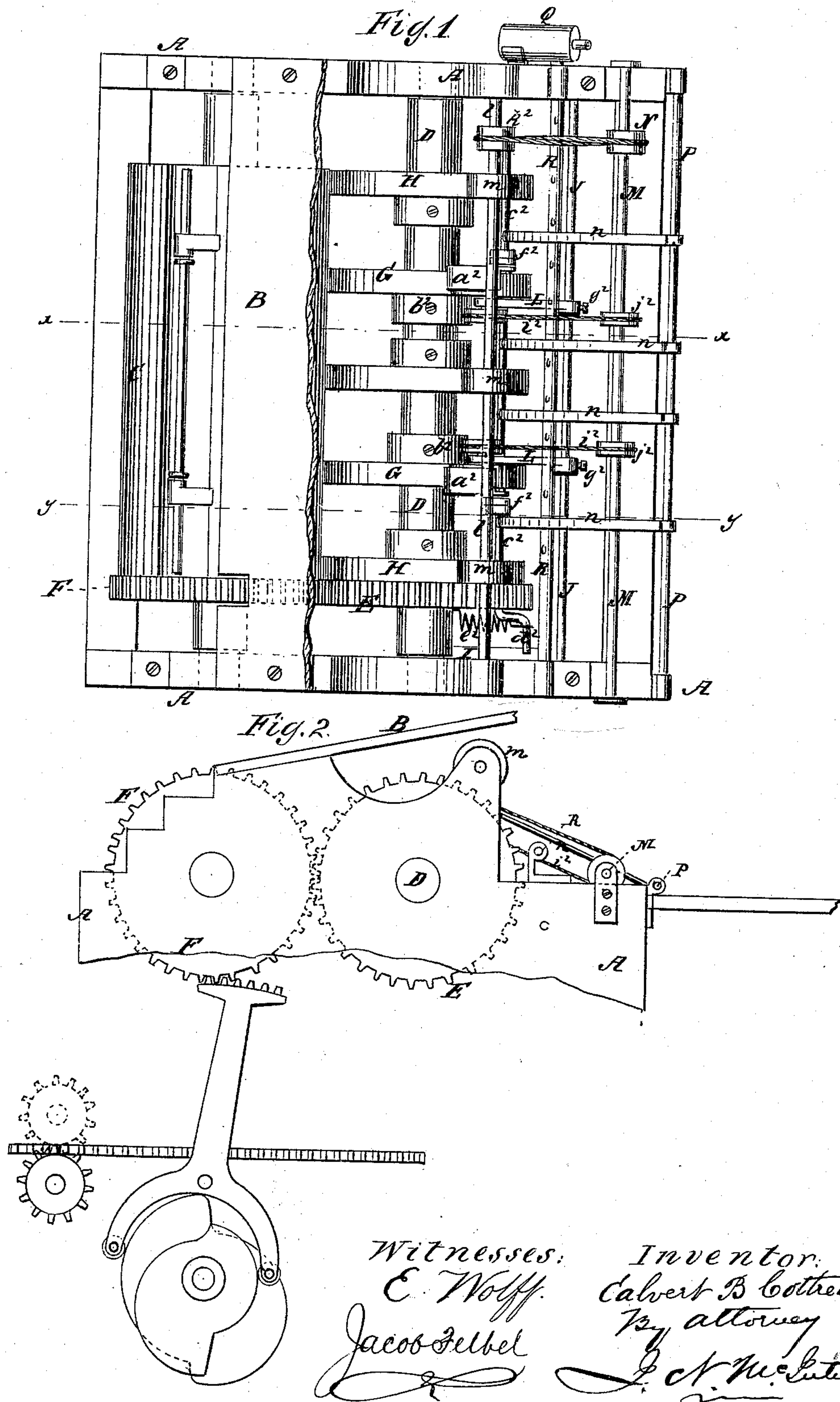


C. B. COTTRELL.
SHEET-DELIVERY MECHANISM FOR PRINTING-PRESSES.
No. 170,061. Patented Nov. 16, 1875.



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Fig. 3.

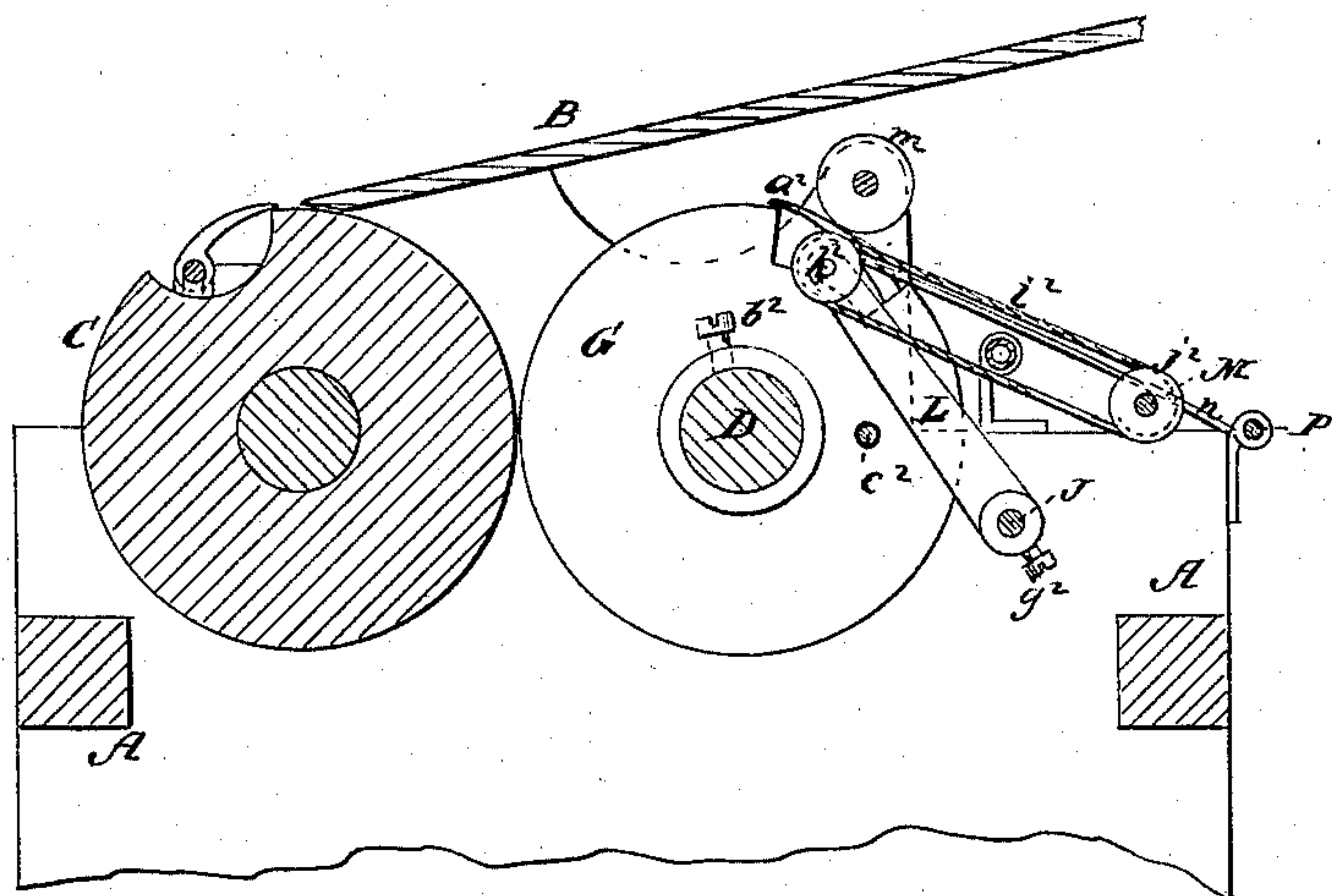
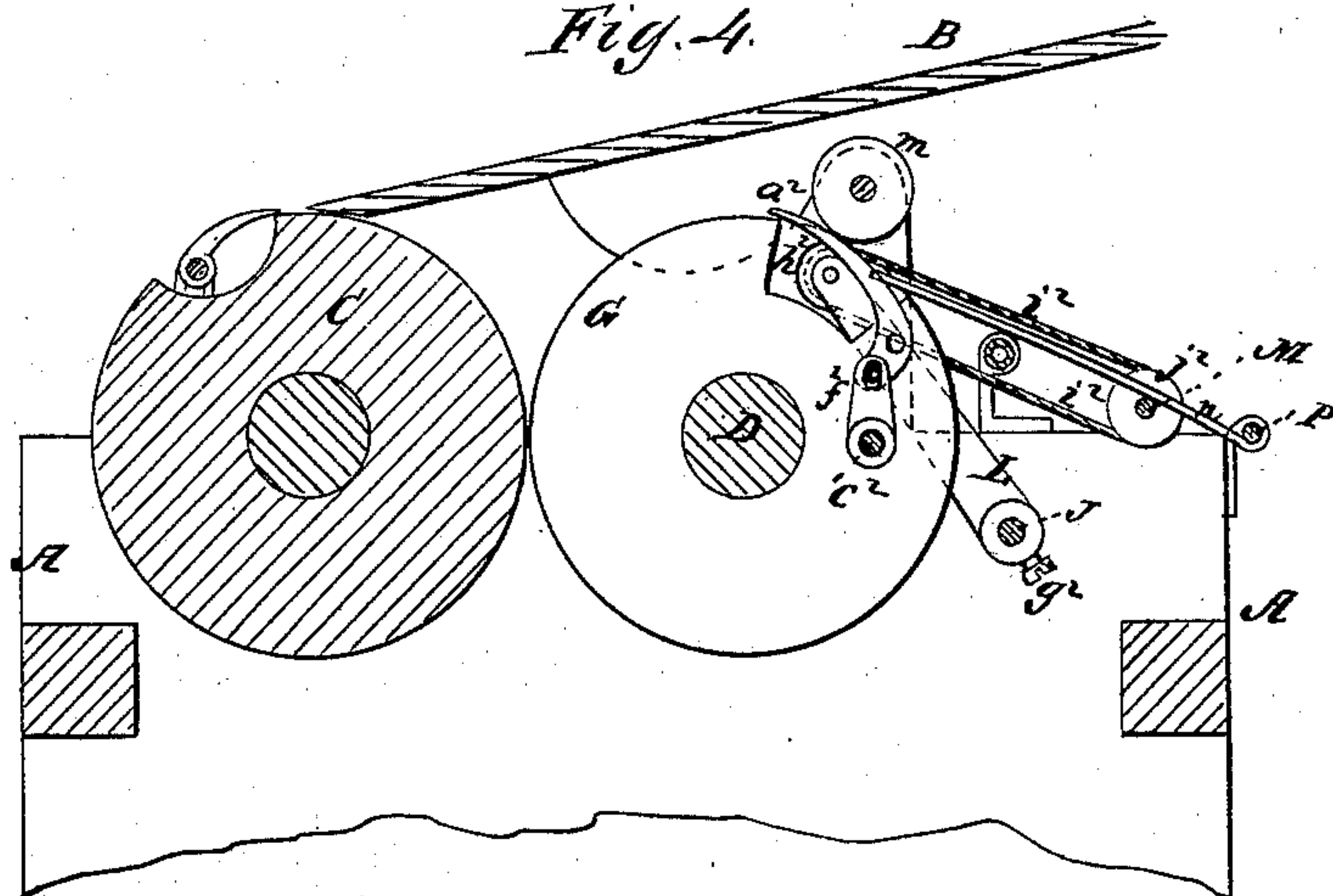


Fig. 4.



Witnesses:

E. Wolff.

Jacob Gelbel

Inventor:

Calvert B Cottrell

By attorney

J. H. McIntire

UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN SHEET-DELIVERY MECHANISMS FOR PRINTING-PRESSES.

Specification forming part of Letters Patent No. **170,061**, dated November 16, 1875; application filed September 24, 1875.

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Westerly, in the county of Washington, in the State of Rhode Island, have invented new and useful Improvement in Sheet-Delivery Mechanism for Printing-Presses; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to certain improvements in those portions of the press which operate upon the sheet after it has received the impression, and effect the taking away of the sheet from the impression-cylinder, and its discharge in a proper manner.

Previous to my invention a great variety of means and numerous and varied combinations of devices have been suggested and employed for taking the printed sheet from the impression-cylinder, both in machines adapted to print on one and on both sides of the sheet, and in which one or more impression-cylinders were employed.

In all of such sheet receiving and discharging mechanisms, however, with which I am familiar, either a receiving-cylinder provided with grippers or tapes, or both, or a series of wheels mounted on a shaft and provided with tapes, or a gripper-receiving cylinder with conveying-bands arranged adjacent to it, has been in some manner combined with the impression-cylinder (or one of them where there were several) of the press, in that kind of presses in which no tapes were used on the said cylinder or cylinders.

In all the modifications of printing-presses in which a receiving-cylinder, either with grippers or tapes, or both, has been in any manner employed for the purpose of taking the printed sheet away from the impression-cylinder, the serious objection of a liability to smut the sheet has existed; while in the different contrivances for taking away the printed sheet in which a series of wheels with tapes, and made adjustable to avoid smutting the sheet, were employed, it has been necessary to locate such receiving means in such relation to the impression-cylinder that it would not take hold of the sheet, nor the impression cylinder let go of it, until the printing should have been

finished; as otherwise, on account of the uncertainty of any tape-carrying mechanism, the sheet might be improperly drawn or pulled, and the impression be spoiled. And in that kind of machine in which a gripper-cylinder has been employed to take the sheet from the impression-cylinder, and had combined with it some sort of auxiliary tape or band carrier, to carry the sheet off to the fly or sheet receptacles, the objection of a liability to smut the sheet, in addition to that of complexity of mechanism, has existed.

My invention, in so far as it relates particularly to the means for taking away from the impression-cylinder the finished sheet, consists in the employment of a series of disks or wheels, the peripheries of which are provided with grippers, and which are so combined with, or so operate in conjunction with, the impression-cylinder as to take the sheet therefrom and carry it, by their positive (gripper) motion, away from the impression-cylinder, and to the discharging mechanism, all of which I will presently more fully describe.

Previous to my invention it has been found difficult, when doing solid tint-work, or turning out work in which the whole surface of the sheet is finished and varnish is used—as, for instance, in colored label work—to avoid spoiling the surface of the finished work by its rubbing on the fly or discharging device in leaving the machine. My invention also consists in the use, in combination with the fly or othersheet-discharging mechanism, of air blasts or currents, by means of which I am enabled to float the sheet along without permitting it to rub or slide, and thus overcome more or less the evil just alluded to.

To enable those skilled in the art to make and use my invention, I will proceed to more fully describe it, referring by letters to the accompanying drawings, in which I have shown only so much of a modern stop-cylinder press as is sufficient for the purpose of clearly illustrating my improvements in printing-presses.

Figure 1 is a partial top view of a printing-press embracing my invention. Fig. 2 is a partial side elevation. Fig. 3 is a vertical section of the same at the line *x x*, Fig. 1, and Fig. 4 is a vertical section at the line *y y* of Fig. 1.

In the several figures I have denoted the same part by the same letter.

A represents part of the frame of the press, in which the working parts are, as usual, mounted, and B the feed-table, from which the paper or blank sheets are fed in. C is the impression-cylinder, and D is a shaft mounted in the frame A, and having its axis arranged parallel to that of the drum or cylinder C. Upon this shaft is secured a spur-gear, E, which meshes with the driving-gear F on the shaft of drum C, and by means of these gears the said shaft D (and its attachments) is rotated in a direction opposite to that in which the drum C turns, as indicated by the arrows at Fig. 2. On the shaft D are secured several wheels or disks, G, in the periphery of each of which is arranged a griper-finger, a^2 . These disks or wheels are splined onto the shaft D, and their hubs are furnished with set-screws, as seen at b^2 , by means of which the said disks may be secured longitudinally in place on the said shaft. By this arrangement or means it will be seen the disks G may be set and secured at any desired point lengthwise of the shaft D. On said shaft D are also mounted and secured permanently near either end two disks or short cylinders, H H, in which is mounted the rock-shaft or "griper-bar" c^2 , which has one end crank-shaped, as seen at d^2 , and is provided at such crank-shaped end with a tension-spring, e^2 , that holds the said griper-bar as and for a purpose to be presently explained. f^2 are arms secured to the griper-bar c^2 by set-screws, and coupled by pivotal pins to the griper-fingers a^2 , that are pivoted to the wheels or disks G, and work in the peripheries of the latter. I is the cam that operates the griper-bar, and J is a rod or bar, arranged as seen, about parallel to the shaft D, and in rear of and below it some distance, to which are secured by set-screws g^2 (so that they may be adjusted or held out at any desired points on said shaft) the arms or stands L, that carry at their upper ends tape-wheels h^2 . The arms L should be so arranged that when secured in place on the rod or bar J they will hold the tape-wheels near to, and just a little below, the level of the highest points in the peripheries of the disks G. The tape-wheels h^2 are hung loosely on pivots to the stands L, and simply serve to carry the tapes or cords i^2 , which pass over them, and wheels j^2 , that are made fast onto the shaft M, that is mounted to rotate in suitable boxes, and which is driven through the medium of its pulley N from the fast pulley K² on shaft l. The last-named shaft l derives its motion through the medium of friction-pulleys m, the peripheries of which run in contact with the wheels H H of shaft D.

The fly, when used, is composed, as usual, of a rock-shaft, P, and arms n, operated by mechanism and in a manner well known. The arms n of the fly should be adjustable on the bar or shaft from which they project. Q is an air-pump, which is so operated from the shaft

D, as shown, or in some other way, as to supply the proper blasts of air at the right time to one or more air-tubes, R, (either with or without suitable branch pipes,) to blow upward against the sheet being discharged from the machine, to float it off, as will be presently more fully explained.

The operation will be understood to be in general as follows: As the impression-cylinder C comes round with the sheet being printed, and before its gripers have let go, the edge of the sheet is seized by the griper-fingers a^2 of the disks or wheels G, and the sheet is carried off by said griper disks or wheels and discharged onto the conveying-tapes i^2 and the fly. It will be seen that since the gripers a^2 take hold of the sheet before the grippers of the impression-cylinder let go, and the shaft D of the wheels or disks G and that of the impression-cylinder are geared together, there will be no danger of any pull or drag on the sheet, or any liability of imperfection in the printing, though the possession of the sheet be transferred from the impression-cylinder to the wheels or disks G during the taking of the impression, and that the receiving wheels or disks G may be, therefore, arranged close to the impression-cylinder, in the manner shown. The printed sheet passes along onto the conveying-tapes i^2 , and is taken therefrom and delivered out by the fly in the usual manner. If the character of the work be such that it is desirable to avoid the slightest rubbing of the printed surface on the tapes i^2 , or on the fly, then I propose to float the sheet down or balloon it along by blasts of air from the pipes already referred to. The details of the air-blast device may, of course, be varied infinitely to adapt this part of my invention to circumstances, and the time of applying and the mode of regulating and controlling the force and directions of the jets or currents of air may be varied according to circumstances, in the judgment of the constructor of machine. It will be understood that, having the wheels or disks G adjustable, they may be set at such points on the shaft D as will adapt them in the different kinds of work to take hold of the sheet at the margins, and that, by making the stands or arms L, and the tape-wheels over which cords i^2 pass, adjustable, these carrying-off tapes may be always set to the margins of the sheet. A great desideratum is gained in practice by such an arrangement of the delivery-tapes i^2 (as seen) with the receiving wheels or disks G as will induce to the location of the upper part of each endless band well up to the point of the periphery of said wheels or disks G, and this desirable location of said delivery-tapes (with their accompanying supporting-wheels and mechanism) is rendered attainable, it will be seen by the location of the griper-bar, well down or inward toward the shaft D and out of the way. This location of the griper-bar, therefore, becomes an essential feature in my improved mechan-

ism, and incidental to this it becomes necessary to have the griper-fingers a^2 turn on axes separate and independent of the griper-bar, though operated by the latter; because, otherwise, the said fingers would move on axes too remote from the periphery of the griper-disks G, and would not operate successfully.

Having so fully explained the construction and operation of my improved printing-press that a skilled person can make and use my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A series of griper wheels or disks, G, or their equivalents, adapted to operate substantially in the manner and for the purposes described.

2. The combination, with wheels or disks G, provided with gripers, of delivery-tapes mounted independently of said disks, substantially as and for the purpose described.

3. In combination with a wheel or disk, provided with a griper-finger, substantially as described, a griper-bar, and an intermediate device for operating said griper-finger, substantially as set forth.

4. The combination, with the delivery mechanism of a printing-press, of an air-pump, or its equivalent, for the production of air-jets or currents, substantially as described, to float or balloon away the printed sheets, as set forth.

In testimony whereof I have hereunto set my hand and seal this 22d day of September, 1875.

C. B. COTTRELL. [L. S.]

In presence of—

JACOB HEINEMAN,
JACOB FELBEL.

2,500 words