

(No Model.)

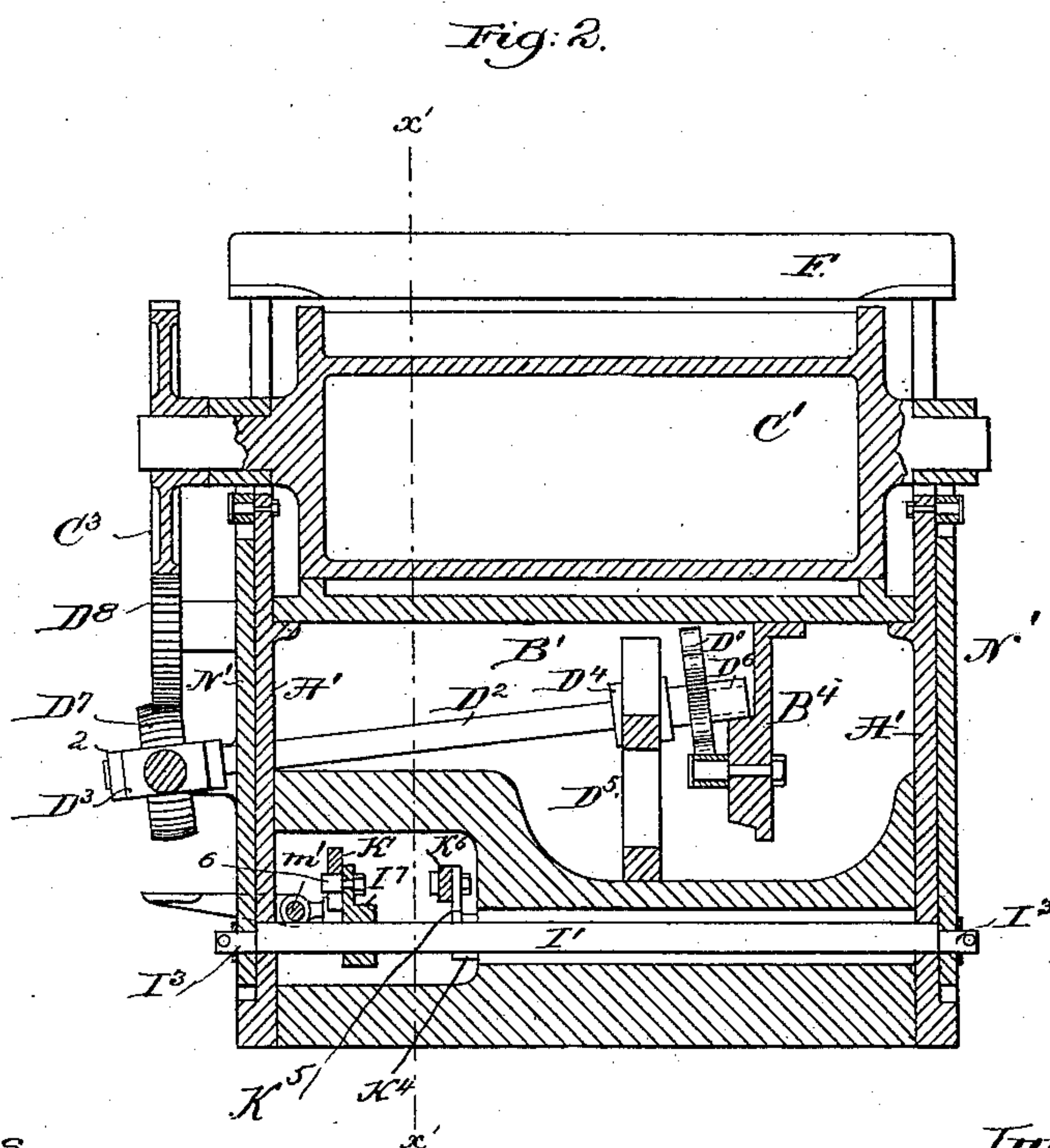
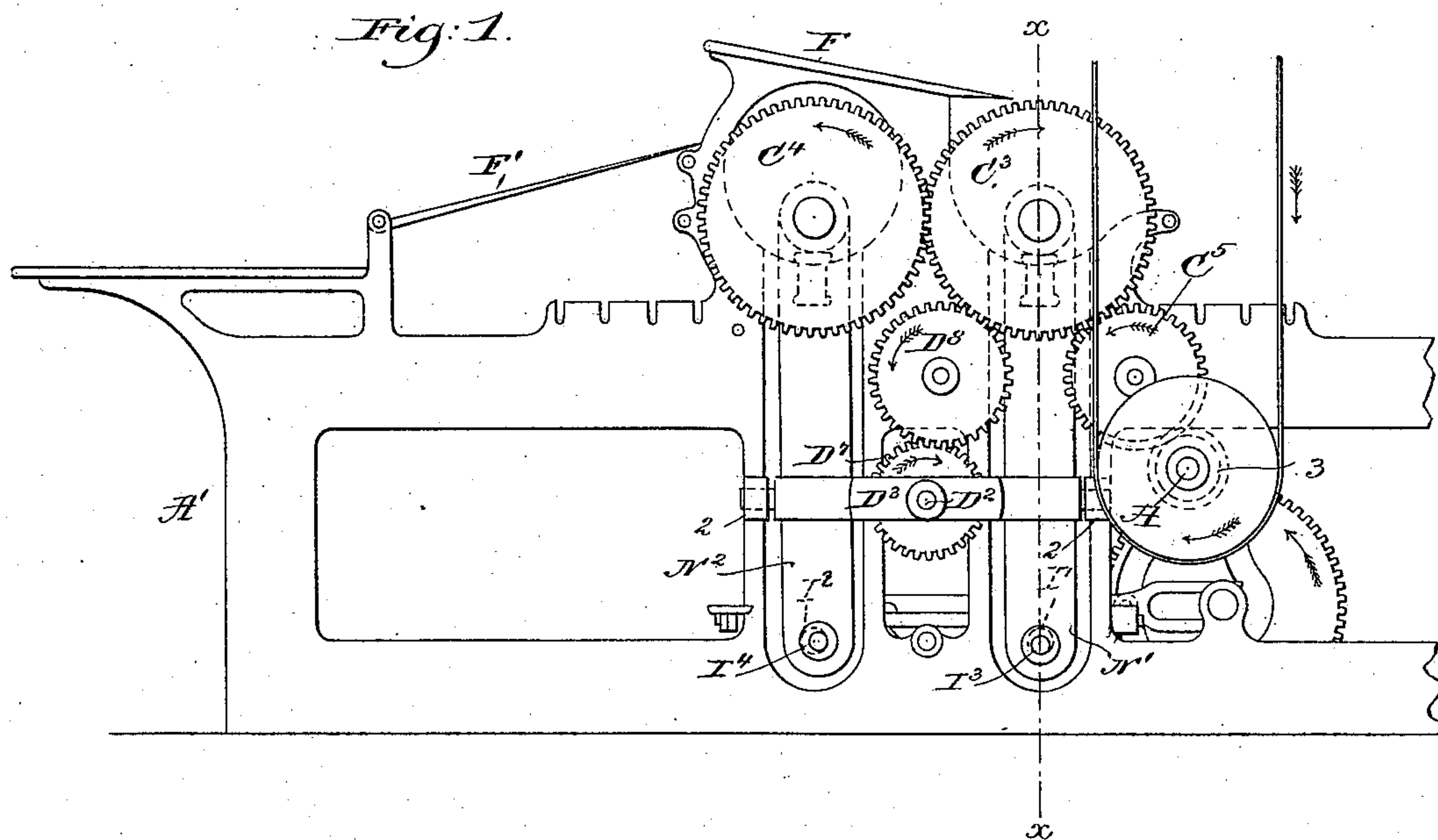
2 Sheets—Sheet 1.

B. HUBER.

PERFECTING CYLINDER PRINTING MACHINE.

No. 370,789.

Patented Oct. 4, 1887.



Witnesses

Frederic L. Emery
John P. C. Prentiss

Inventor.

Berthold Huber.

by Crosby & Gregory
attys.

(No Model.)

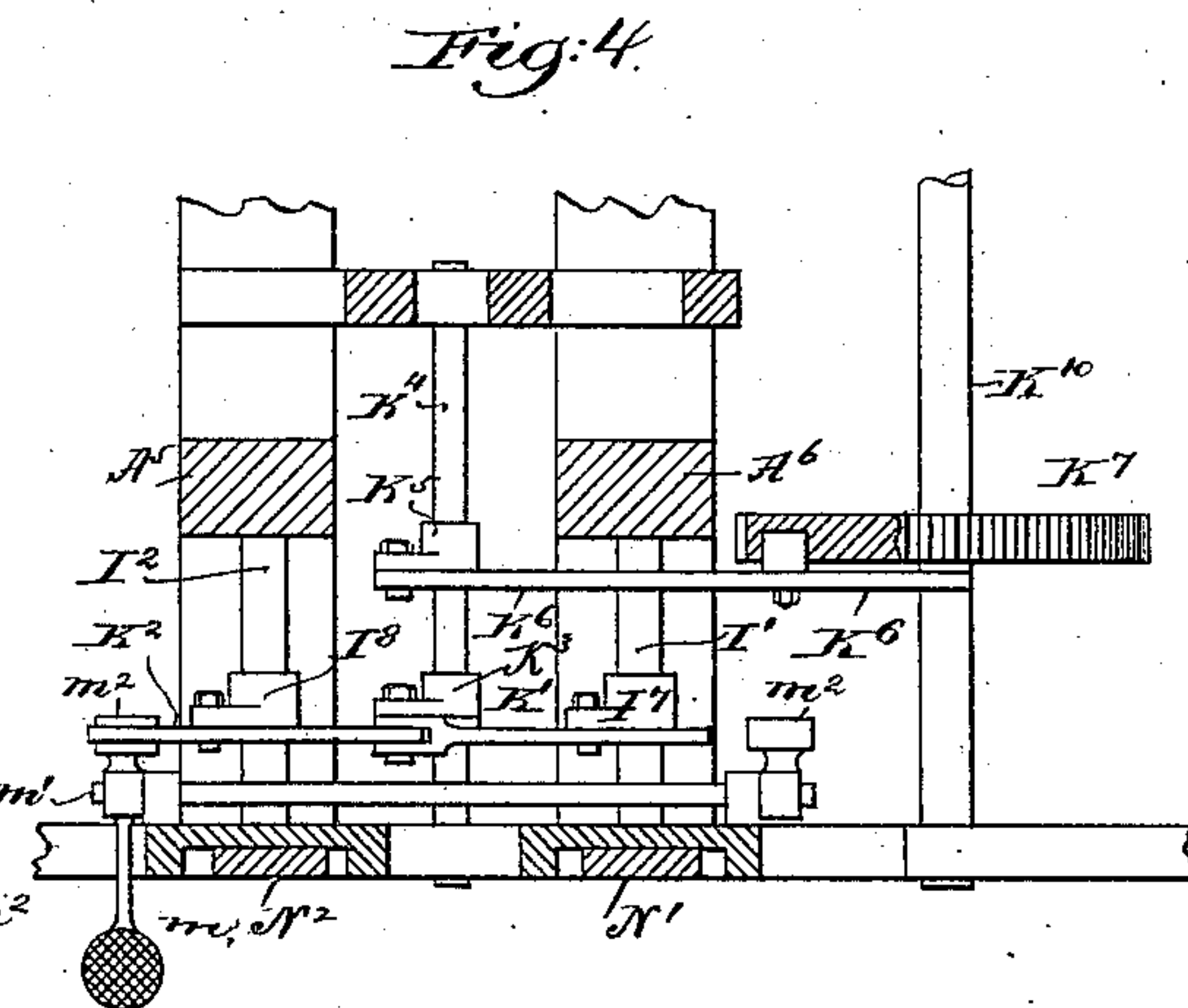
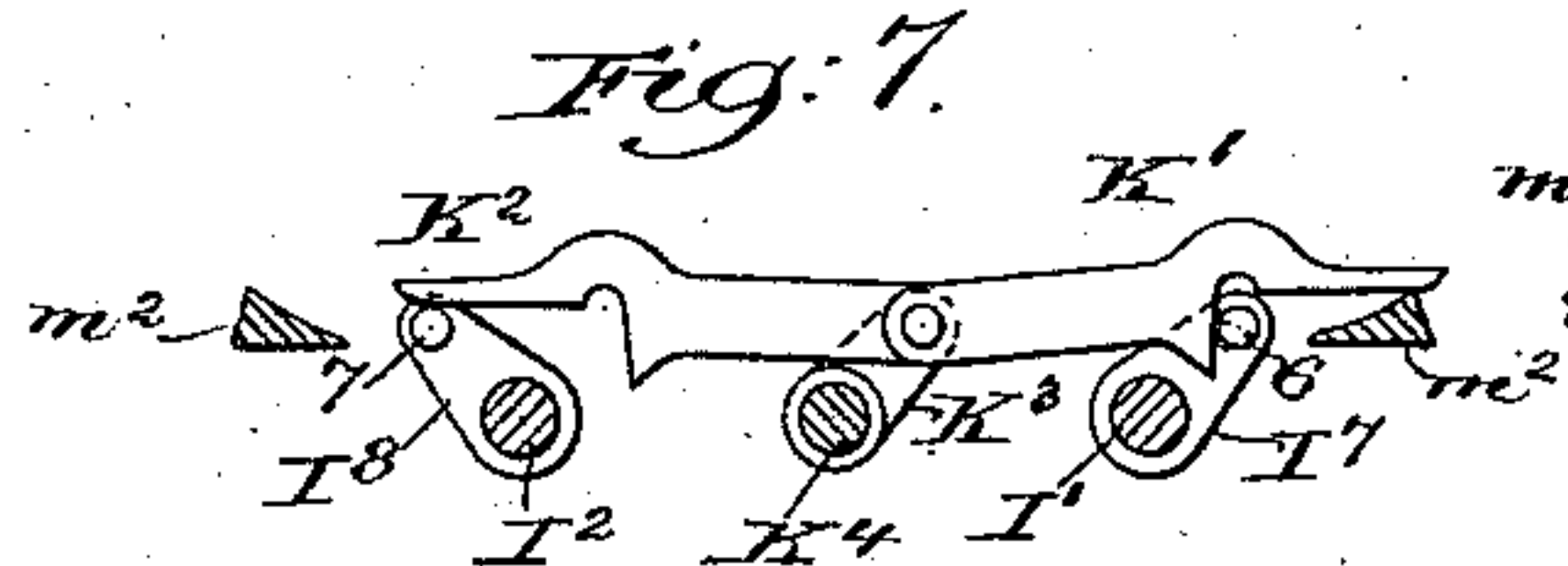
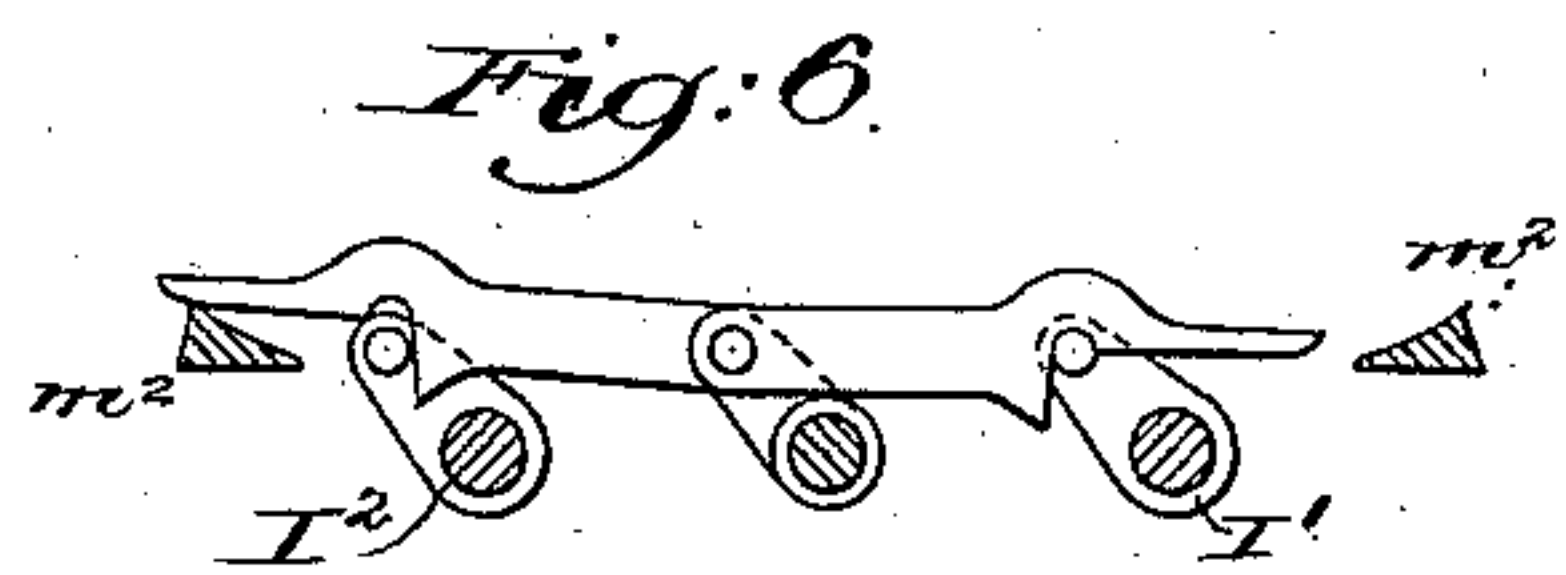
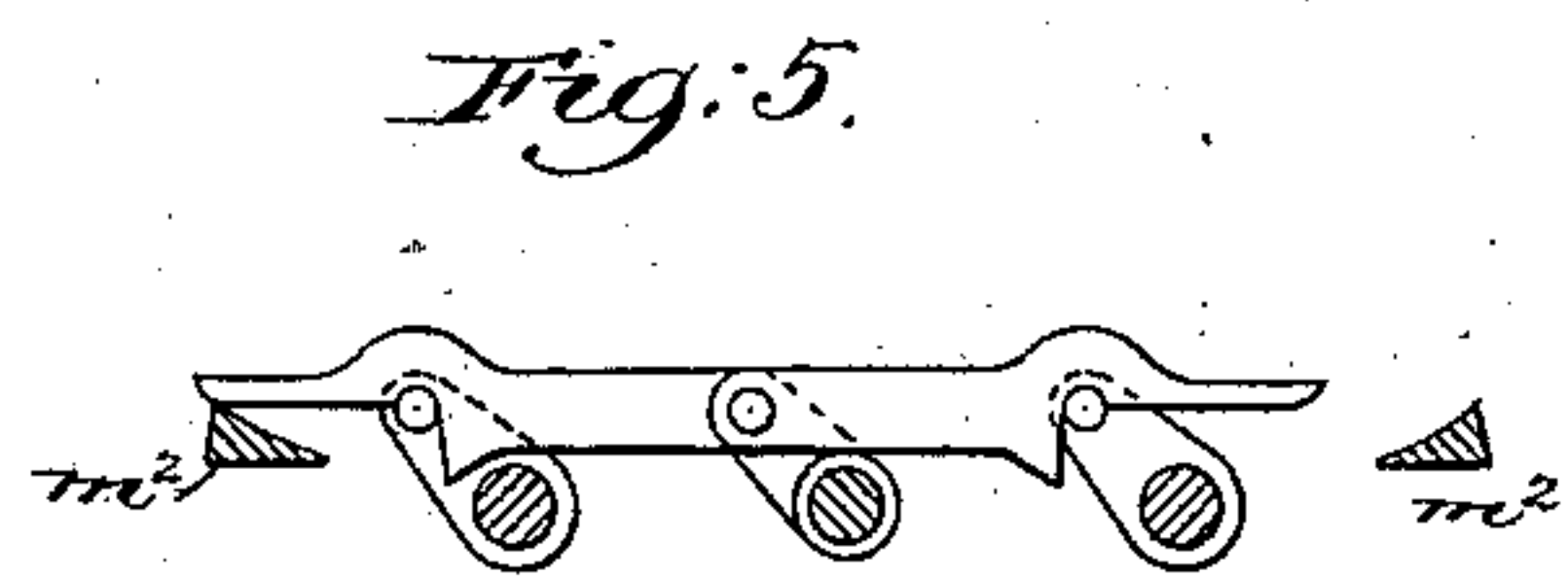
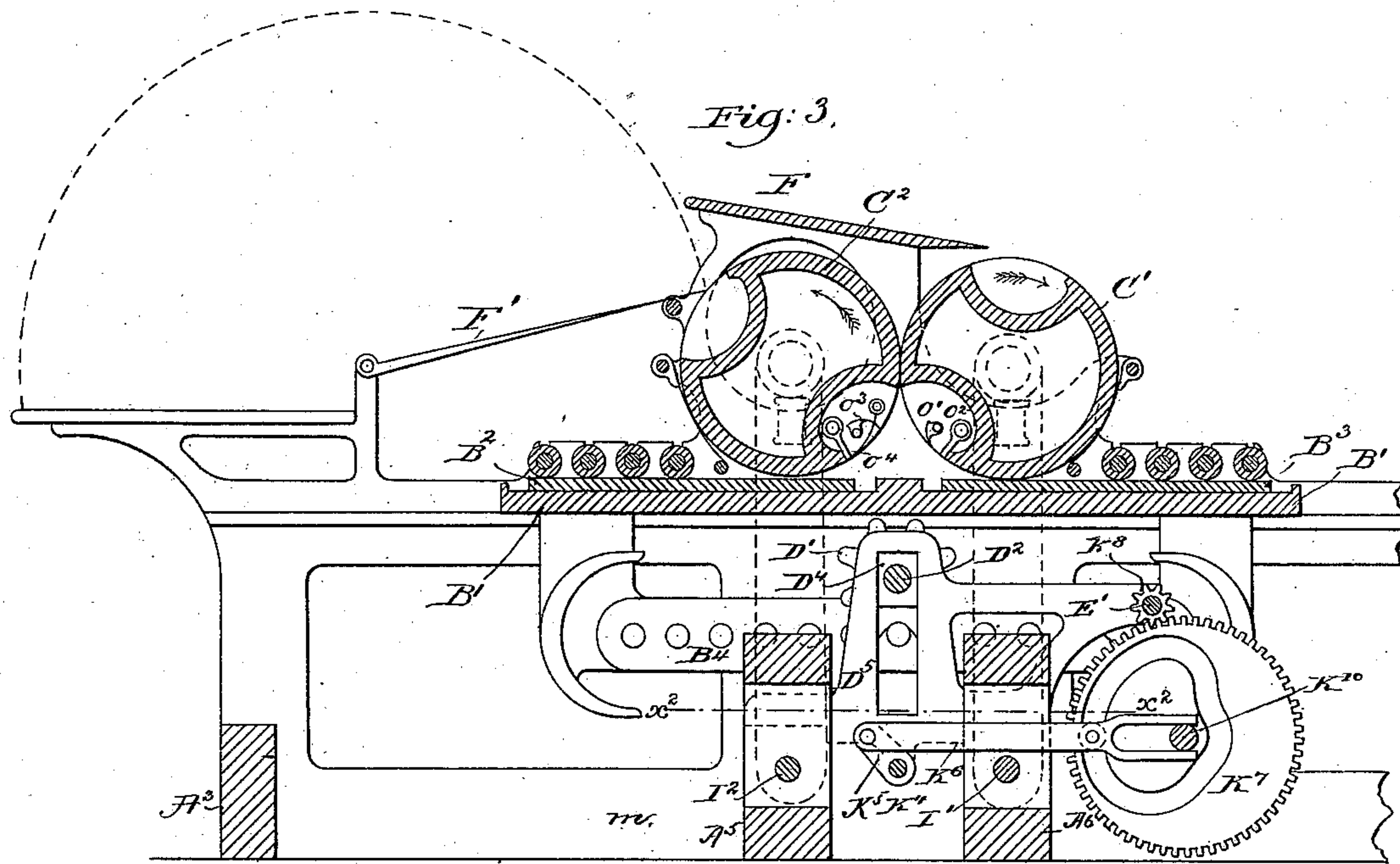
2 Sheets—Sheet 2.

B. HUBER.

PERFECTING CYLINDER PRINTING MACHINE.

No. 370,789.

Patented Oct. 4, 1887.



Witnesses.
Fred L. Emery.
John F. C. Prentiss.

Inventor:
Berthold Huber.
by Crosby & Gregory attys.

UNITED STATES PATENT OFFICE.

BERTHOLD HUBER, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO THE
HUBER PRINTING PRESS CO., OF SAME PLACE.

PERFECTING CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,789, dated October 4, 1887.

Application filed February 27, 1886. Serial No. 193,442. (No model.)

To all whom it may concern:

Be it known that I, BERTHOLD HUBER, of Taunton, county of Bristol, and State of Massachusetts, have invented an Improvement in Printing-Presses, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to that class of printing-presses known as "sheet-perfecting presses," in which the sheet receives an impression on both its sides before being delivered from the machine.

My present invention has for its object to arrange or operatively combine two impression-cylinders with a reciprocating bed having two forms in such manner that one of the forms will come in contact with one of the impression-cylinders during the forward stroke of the bed, and that the other form will come in contact with the other impression-cylinder during the back stroke of the bed, the feed-board, the fly, the cylinders, and actuating parts being, however, so constructed and arranged that the stroke of the bed is not longer than the stroke of the bed of a single printing-press having a form of the same size, thus making it possible to produce twice the work of a single printing-press in the same time. In this invention the direction of rotation of the two cylinders and the location of the feed-board and fly or delivery are such that the sheet to be printed on both sides, instead of being passed between the two cylinders, is presented to the grippers of the cylinder most remote from the position of the feeder, the said cylinder being provided with a sheet at every other rotation, and the sheet taken by the said cylinder is carried down at its side most remote from the feeder, and between the said cylinder and the bed, and one side of the said sheet having been printed, the grippers of the said cylinder first to take the sheet are operated, and also the grippers of the cylinder nearest the feeder, to thereby release the sheet upon one cylinder and enable it to be taken by the second cylinder, the latter carrying the sheet up between the two cylinders, then down under the said second cylinder and between it and the bed, the latter as the unprinted side of the sheet meets it being on its opposite stroke.

The grippers of the said second cylinder hold the sheet and carry it a second time between the two cylinders, and the sheet is then discharged upon the fly or delivery in usual manner, the sheet being printed on both sides. As described, it will be understood that the sheet fed to the cylinder most remote from the position of the feeder is thereafter moved toward the end of the press from which the sheet was removed.

Other objects of my invention are to furnish suitable means for transferring the sheet after receiving an impression from the first impression-cylinder onto the second impression-cylinder, and to provide suitable means, so as to enable the feeder at will and without leaving his position to "trip" or hold either of the impression-cylinders out of contact with their respective forms.

The particular features in which my invention consist will be hereinafter described, and set forth in the claims at the end of this specification.

In the accompanying drawings I have shown my invention as applied to a printing-press having two two-revolution impression-cylinders.

Figure 1 is a partial side elevation of a press of the form referred to. Fig. 2 is a cross-section on the line $x x$, Fig. 1. Fig. 3 is a longitudinal section on the line $x' x'$, Fig. 2. Fig. 4 is a horizontal section in line x^2 , Fig. 3, showing a part of the machine; and Figs. 5, 6, and 7 are views showing different positions of the trip-levers and connecting-rods.

A' marks the side frames, A³ an end cross-stay, and A⁵ A⁶ the two center cross-stays.

The bed B', adapted to slide on lips or ways provided on each of the side frames, has at its upper side two forms, B² B³, and at its under side the said bed has attached to it a rack, B⁴, common to what is known as the "Napier" movement, and substantially such as shown in my patent of the United States No. 285,750.

The reversing-shaft D², provided with the reversing-pinion D', has its end supported in the swivel-box D³, pivoted upon lugs or ears 2, attached to the side frame, said shaft near its opposite end running in a square box, D⁴, arranged to slide up and down in the slotted bracket D⁵ as the roller D⁶, at the inner end of

the said shaft, travels along the sides of the straight part or rib of the rack B⁴.

The reversing-gear is held in its proper working position by the roller D⁶ on one side, 5 and the top and bottom of the slot in the bracket D⁵.

On the outside of the frame and in the center of the swivel-box is a pinion, D⁷, fastened to the shaft D² and driven by the intermediate gear, D⁸, which is rotated by the cylinder-gear C³, the latter gear being driven by the intermediate gear, C⁵, which is rotated by a pinion, 3, (shown by dotted lines, Fig. 1,) fastened to the driving-shaft A.

15 The gear C³, attached to the shaft of the impression-cylinder C', engages the gear C⁴ on the shaft of and rotates the impression-cylinder C². Herein each impression-cylinder makes two revolutions to one complete stroke 20 of the bed B' of the press, one while the bed is moving forward and another while the bed is moving back, and to enable this to be done practically each impression-cylinder C' and C² has to be held down while printing and to be 25 lifted up when the bed is passing under it in a path so that the surface-motion of the cylinders are both in the same direction, and therefore the impression-cylinder C' will be down during the forward stroke of the bed, and the impression-cylinder C² will be down during the 30 back stroke of the bed, and vice versa. This is accomplished by the rock-shafts I' I², both alike and having bearings in the side frames, A' A', as indicated in Fig. 2, and having eccentric ends I³ and I⁴, respectively, outside the said 35 bearings for the said shafts. It will be noticed, in comparing Figs. 1 and 2, that the dotted circles in Fig. 1 indicate the shafts I' and I², and that the full circles within and eccentric to these said circles indicate the eccentric 40 ends I³ and I⁴.

At each side of the press-frame are cylinder-lifting bars or rods N' N², the lower ends of which are fitted upon the eccentric ends I³ of the rock-shafts, the upper ends of the said lifting-rods having bearings for the reception of the shafts of the impression-cylinders. These lifting bars or rods N' and N² are provided at their lower ends in any usual manner with the usual springs, of sufficient strength to practically counterbalance the weight of the impression-cylinders. I have deemed it unnecessary to show such springs, as they are common and usual.

The rock-shafts I' I² have, respectively, crank-arms I⁷ I⁸, provided with pins 6 and 7, which at times are engaged by pawls K' K², pivoted upon an arm, K³, fastened to the rock-shaft K⁴, the latter having an arm, K⁵, having jointed to it a connecting-rod, K⁶, provided with a suitable stud or roll that enters a cam-groove in a cam-gear, K⁷, fast on the shaft K¹⁰, and deriving its rotation from the pinion K⁸ on the shaft E', the rotation of the cam-gear K⁷ causing the reciprocation of the rock-shaft K⁴ and its two pawls K' K², one or the other of

the said pawls engaging one or the other of the pins 6 or 7, and turning one or the other shafts I' I².

The shaft m' has at its ends lifting-fingers 70 m², and at one end a treadle, m, which, when depressed at its outer end, causes the lifting-fingers m² to rise into the positions shown in Fig. 7 and elevate the free ends of the pawls K' K², thus elevating their hooks away from 75 the pins 6 and 7 of the arms I' I², so that, as the said connecting-rods reciprocate forward and back, they do not move the said arms and their rock-shafts from the positions shown in Fig. 7, both impression-cylinders at such time 80 being raised away from their respective forms. If the treadle m is depressed when the arms I' I² are not in the positions shown in Fig. 7, they will be pushed into said positions by means of the prolonged sides of the notches in 85 the pawls K' K², which are never lifted so high but that the said prolonged sides of the said notches can engage the pins in the free ends of the said arms I' I². (See Figs. 5, 6, and 7.)

The sheet to be printed is fed in the usual 90 manner from the feed-board F onto the impression-cylinder C', where it is held by usual grippers, o', (which are operated in any well-known manner,) and which clamp the edge of the sheet against the gripper-rests o². 95

The sheet to be printed on both sides is passed from the feed-board F to the grippers of the cylinder C', which latter, co-operating with the form B³, makes the first impression, and thereafter the sheet is taken by the grippers o³ of the impression-cylinder C², which close in between the gripper-rests o² and clamp the sheet against the gripper-rests o⁴ on the said cylinder C², and the said sheet is carried 100 up between the two cylinders C' C² and down 105 under the cylinder C², where it receives its second impression from the form B² co-operating with the cylinder C², and is again carried up between the said cylinders C' and C², and the sheet, printed on both sides, is delivered upon 110 the fly F'.

I claim—

1. In a printing-press, the combination, substantially as described, of a reciprocating bed 115 having two forms, two impression-cylinders provided with grippers to take the sheet printed on one side from one cylinder and transfer it to the other and reverse it thereupon, the toothed wheels C³ C⁴, intermediate gear, C⁵, and main driving-shaft A, with which 120 said last-named gear is secured, lifting-rods in which said cylinders are journaled, eccentrics for raising and lowering said rods, rock-shafts supporting such eccentrics, crank-arms provided with laterally-projecting pins connected 125 to the said rock-shafts, reciprocating toothed pawls to engage one or the other of the crank-arms, a shaft, D², rack B⁴, and geared wheels D⁷ and D⁸, geared with the wheel C³, substantially as and for the purpose specified. 130

2. The two impression-cylinders, their connecting-gearing C³ C⁴, and the lifting bars or

rods receiving the journals of the said cylinders, and the rock-shafts I' I², having eccentric ends to move the said bars or rods, and crank-arms provided with laterally-projecting pins connected to the said rock-shafts, combined with the reciprocating toothed pawls, which may be made to engage one or the other of the crank-arms and lift the impression-cylinders, substantially as described.

10 3. In a printing-press, the rock-shaft K⁴, the reciprocating link K⁶, to turn the rock-shaft, the two pawls K' K², and the rock-shafts I' I², having crank-arms provided with lateral pins

to be engaged by the said pawls, combined with a rock-shaft, its two pawl-lifters, and with a treadle to turn the rock-shafts and cause the lifters to raise or lower the pawls, substantially as described. 15

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 20

BERTHOLD HUBER.

Witnesses:

W. K. HODGMAN,
EDWARD P. COLEMAN.