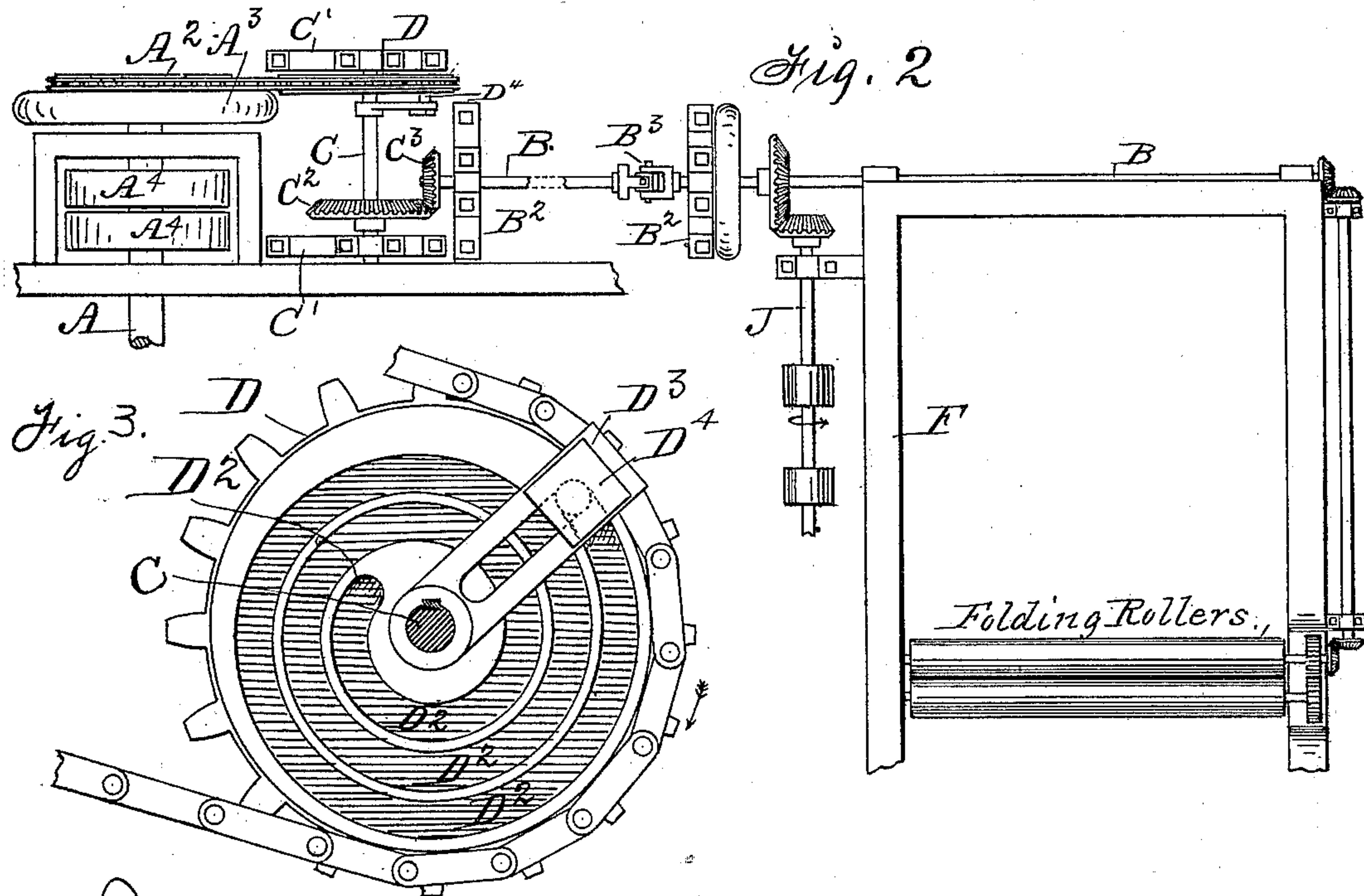
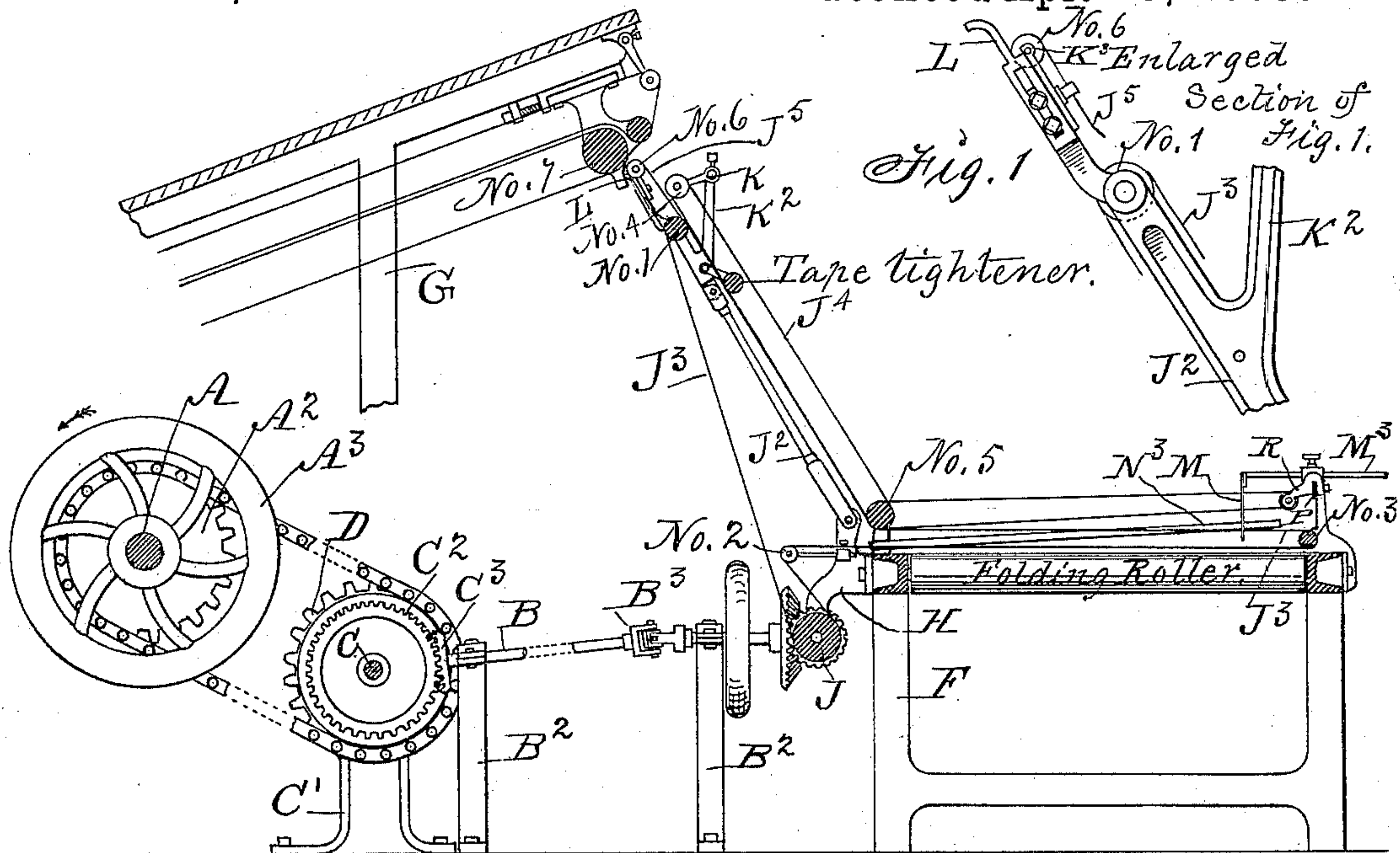


T. C. DEXTER.

PAPER FOLDING ATTACHMENT FOR PRINTING PRESSES.

No. 401,737.

Patented Apr. 23, 1889.



Witnesses:
M. Anderson,
Orra B. Moore.

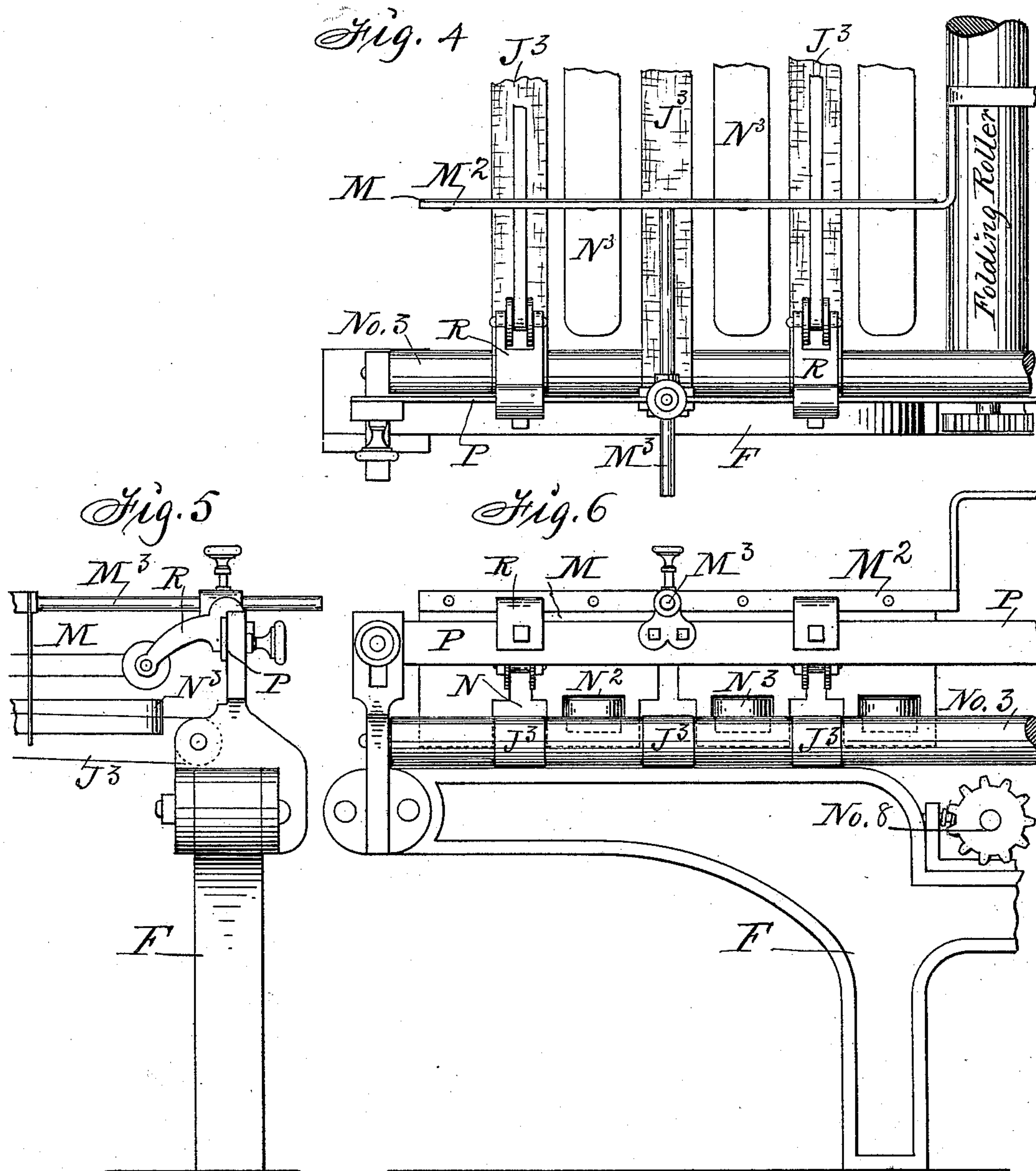
Inventor:
Talbot C. Dexter,
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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF DES MOINES, IOWA.

PAPER-FOLDING ATTACHMENT FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 401,737, dated April 23, 1889.

Application filed May 31, 1884. Serial No. 133,431. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States of America, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Paper-Folding Attachment for Printing-Presses, of which the following is a specification.

My invention consists in the construction and combination, with a cylinder-press and a folding-machine, of an improved device for connecting the gearing of the two machines in such a manner that the bed of the press can be run back and the folding-rollers retained stationary without disconnecting the gearing, in an improved adjustable carrier adapted to deliver a printed sheet from the press to the folding-machine, and in an improved gage device for controlling the advance of the sheets relative to the folding-rollers, as hereinafter fully set forth.

Figure 1 of the accompanying drawings is an elevation showing the relative positions of the driving-shafts of the press, the adjustable sheet-carrier, and the folding-rollers. Fig. 2 is a top view of the gearing of the two machines connected by means of my device. Fig. 3 is a side view of my connecting device. Fig. 4 is a top view, Fig. 5 an end view, and Fig. 6 a side view, of my gage for controlling the movements of the printed sheets relative to the folding-rollers.

Jointly considered these figures clearly illustrate the construction, application, and operation of my complete invention.

A represents the driving-shaft of a cylinder-press, and A^2 a chain-wheel; A^3 , a balance-wheel, and A^4 a belt-wheel fixed to the shaft A. A second belt-wheel, A^4 , is placed loosely upon the same shaft.

B is the driving-shaft of the paper-folding machine, supported by bearers B^2 , that are fixed to the floor.

B^3 represents a joint that will allow flexure in the shaft B whenever required by the relative positions of the two machines.

C is an auxiliary driving-shaft supported in bearers C' , fixed to the floor at right angles relative to the ends of the shaft B.

C^2 is a bevel-gear fixed to the shaft C to engage a wheel, C^3 , fixed to the end of the shaft B.

D is a chain-wheel placed loosely upon the

end of the shaft C. On its inside face and around its axis is formed a convolute groove, D^2 .

D^3 is an arm that has a longitudinal slot, and that is fixed to the shaft C at a point close to the wheel D.

D^4 is a stud fitted in the slot of the arm D^3 , and carried by said arm in such a manner that the end of the stud will project into the groove D^2 of the wheel D and traverse that groove, and also slide in the slot of the arm. A flexible connection is thus maintained between the parallel shafts C and A, that allows the motion of the shaft A to be reversed, as required, to run the form on the bed back while the shafts C and B and the sheet delivering and folding mechanism connected therewith remain stationary. The chain-wheel D is connected with the chain-wheel A^2 on the shaft A and moves in concert therewith; but when a backward motion occurs, as required in running back the bed of the press to adjust it relative to the cylinder, the shafts C and B are allowed to remain stationary by means of the pin or stud D^4 being allowed to slide in the convolute groove in the face of the wheel and also in the slot of the arm, and consequently the sheet carrying and folding mechanism connected with the shaft B will remain inactive, while the motion of the loose chain-wheel D is reversed and the bed run back without uncoupling the gearing of the two machines.

F represents the frame of a folding-machine, and G a section of the frame that supports the feeding-table and the delivering tapes and pulleys of a press.

H is an auxiliary frame or bracket fixed to the frame F to support my adjustable sheet-carrying mechanism.

J is a horizontal shaft, to which tape-pulleys are fixed. It has its bearings in the frame H, and is connected with the shaft B by means of bevel-gear.

J^2 is a frame hinged to the brackets H in such a manner that it will extend vertically or fold down flat upon the folding-machine. The side pieces of this frame are forked at their top ends and provided with bearings for shafts.

No. 1 is a shaft or tape-operating roller near the top of the frame J^2 .

No. 2 is a roller supported in bearings that are adjustably connected with the brackets H and the driver-pulleys on the shaft J.

No. 3 is a roller on the side of the folding-machine opposite from the roller No. 2.

J³ represents a series of endless tapes stretched over the rollers Nos. 1, 2, and 3.

No. 4 is a tape-roller supported by bearings K, that are adjustably connected with the branches K² of the frame J².

No. 5 is a roller in bearings fixed to the top of the folding-machine frame F.

J⁴ represents a series of endless tapes stretched over the rollers Nos. 4 and 5.

No. 6 is a shaft in bearings K³, adjustably connected with the top of the frame J², which top is an integral portion of said frame.

J⁵ represents a series of short endless tapes stretched over the pulleys on the shafts No. 6 and No. 1.

L are short curved arms, adjustably connected with the top of the frame J² to engage the frame that supports the shaft No. 7 of the sheet-delivering mechanism of the press, and to support the frame J² in such a position relative to the shaft No. 7 that the printed sheets delivered over that shaft will, by means of the series of tapes J⁵ J⁴ J³, carry the sheets to my gage and the folding-rollers that double the sheets.

When the machine is not in operation, the hinged frame J² and the rollers and tapes attached can be folded down to rest upon the top of the folding-machine. To accomplish this I simply slide the adjustable bearers that carry the roller No. 2 toward the folding-machine to slacken the tapes J³, that are stretched over the rollers Nos. 1, 2, and 3.

M is one section of my adjustable gage, in the form of a sheet-metal plate fixed to a bar, M², that has an arch in its center to accommodate the vertical movements of a folding-blade that doubles sheets between a pair of folding-rollers, No. 8.

M³ are arms fixed to the gage and adjustably connected with the frame of the folding-machine, so that the gage can be moved at right angles relative to the folding-rollers and retained at any point desired to square and stop the sheet preparatory to its being doubled down between the folding-rollers by a folding-blade in a common way.

N are slots formed in the sheet-metal sections M of the gage for the passage of tapes.

N² are slots in the same sections, through which wooden slats N³ are projected to be raised and lowered relative to the tapes J³, upon which the sheets are carried toward the gage.

P is a bar adjustably connected with the frame F in such a manner that it can be raised and lowered. The arms M³, that carry the gage-sections M, are attached to the bar P.

R represent pulley-bearers fixed to the bar P. Tapes extend from the pulleys carried on the bearers R to the roller No. 2, to aid in advancing the sheets and to retain the sheet on

the tapes and slats upon which they are moved.

The slats N³, that extend through the gage M at their rear ends, are attached to the frame F at a point below the roller in such a manner that their top surfaces will be below the tapes J³, that carry the sheets, at the one side of the machine, and above the same tapes at the other side. The degree of inclination can be changed by raising and lowering the gage M, through which the slats extend. By thus inclining the slats from a point below the tapes at the one side of the machine to a point above the same tapes at the opposite side the printed sheets are lifted from the moving tapes and advanced upon the stationary slats until they come in contact with the gage M, and are retained thereby until the folding-blade doubles them down between the folding-rollers, and by thus relieving the sheets from the friction of the tapes as the sheets approach the gage they will remain smooth and not be crowded and cramped and creased by the force and friction of the tapes, but advanced gently to the gage and stopped thereby without being overlapped or wrinkled.

From the description of the construction and function of each element and sub-combination the unitary actions of all the parts and the practical operation of my complete invention is obvious.

I am aware that gages and bent bars have been adjustably combined with carrying-tapes; but my manner of extending straight slats through a gage that can be adjusted horizontally and also vertically relative to the tapes for the purpose of lifting the ends of slats above the tapes to diminish the friction of the tapes upon the sheets, and to thereby prevent the sheets from being too suddenly arrested by the gage, is novel and important in keeping the sheets from being creased and wrinkled as they are folded.

I am also aware that a jointed frame carrying rollers and tapes has been hinged to a folding-machine and combined with mechanism for operating the tapes in such a manner that the jointed frame could be bent to relax the tension of the tapes for the purpose of folding the hinged frame down upon the folding-machine without removing the tapes from the rollers. Adjustable rollers have also been used for regulating the tension of tapes; but my combination of an adjustable roller with a hinged frame carrying rollers and tapes and mechanism for operating said tapes in concert with a printing-press and a folding-machine enables me to raise and lower the hinged frame without joints for bending the frame to relax the tension of the tapes, as required, to fold down the frame without removing the tapes.

I claim as my invention—

1. A loose wheel, D, having a spiral or convolute groove in its side face, a shaft, C, a slotted arm, D³, and a pin or stud, D⁴, in combination with the driving-shafts A and C and

sheet carrying and folding mechanism, to operate in the manner set forth, for the purposes specified.

2. The hinged frame J^2 , the tape shaft or roller No. 1, the shaft J, carrying driver-pulleys, the adjustable roller No. 2, the rollers Nos. 3 and 5, and series of endless tapes J^3 and J^4 , and operating mechanism arranged and combined to operate in the manner set forth in conveying sheets from the press to the folding mechanism.

3. The adjustable arms L, the adjustable arms K, carrying a roller, No. 4, and a series of endless tapes, in combination with the hinged frame J^2 , the rollers Nos. 3 and 5, and the series of endless tapes J^3 , to aid in carrying a sheet from a printing-press to a folding-machine.

4. The adjustable shaft No. 6, carrying a series of short endless tapes, in combination with the hinged frame J^2 , the roller No. 1, and the endless tapes J^3 and J^4 , the shaft No. 7, and a series of sheet-delivering tapes, combined with said shaft No. 7, as illustrated in Fig. 1, to convey sheets to the folding-machine.

5. A frame consisting of two parallel arms or side pieces hinged to the frame of a paper-folding machine and connected at their outer

ends by means of a roller journaled thereto, a series of sheet-carrying tapes stretched over said roller carried by said hinged side pieces, and also stretched over rollers journaled to the machine-frame, and an adjustable roller connected with the same machine-frame, arranged and combined relative to each other and the sheet-delivery mechanism of a printing-press to operate in the manner set forth, for the purposes stated.

6. In a paper-folding machine, an adjustable gage supporting rigid slats, in combination with sheet-carrying tapes for the purpose of lifting the advancing sheets relative to the tapes, in the manner set forth.

7. The gage M, having slots N and N^2 , and supporting-slats N^3 , the adjustable arms M^3 , and the adjustable bar P, in combination with a series of endless tapes, J^3 , substantially as shown and described, to operate in the manner set forth, for the purposes stated.

8. The gage M M^2 , carrying slats N^3 , the arms M^3 , and the adjustable bar P, arranged and combined as and for the purposes stated.

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Witnesses:

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