

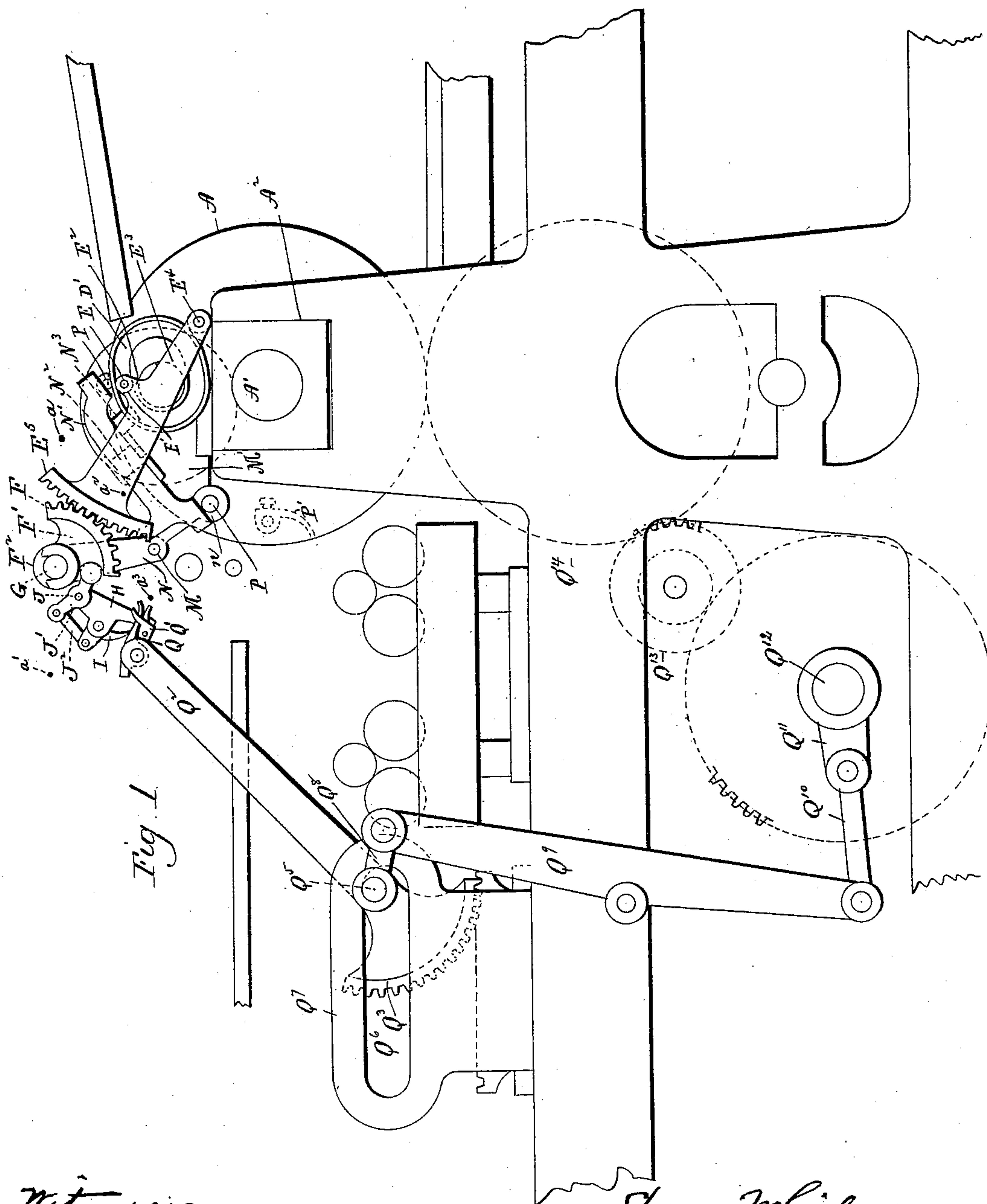
(No Model.)

2 Sheets—Sheet 1.

S. WHITLOCK.
PRINTING PRESS.

No. 599,990.

Patented Mar. 1, 1898.



Witnesses.
J. H. Shumway
Lillian D. Kelsoy.

Sturges Whitlock.
Inventor.
By Atty. Earl Seymour

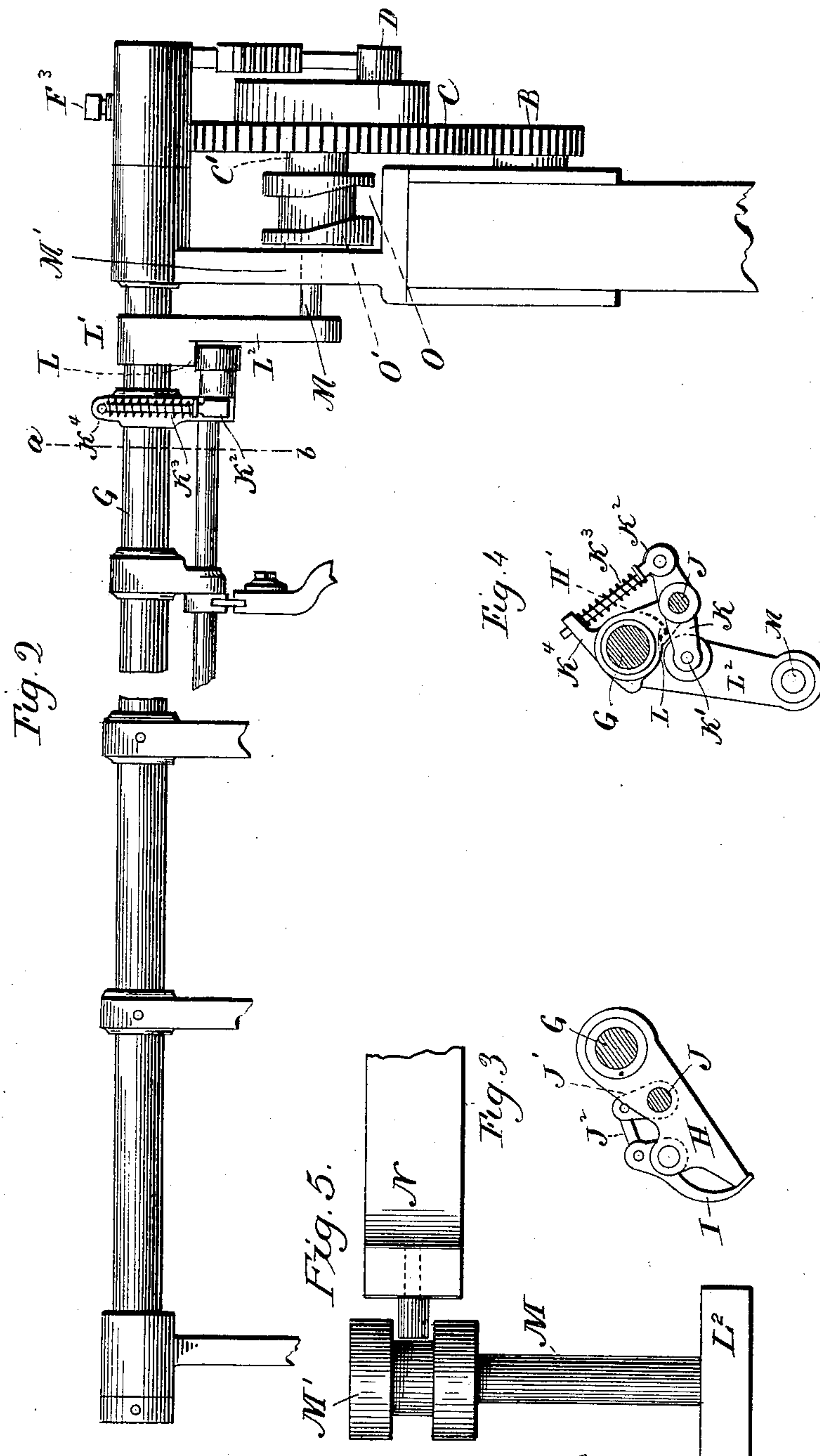
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J. H. Shumway.
F. M. Oser.

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UNITED STATES PATENT OFFICE.

STURGES WHITLOCK, OF SHELTON, CONNECTICUT, ASSIGNOR TO THE
WHITLOCK MACHINE COMPANY, OF DERBY, CONNECTICUT.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 599,990, dated March 1, 1898.

Application filed November 25, 1895. Serial No. 570,017. (No model.)

To all whom it may concern:

Be it known that I, STURGES WHITLOCK, of Shelton, in the county of Fairfield and State of Connecticut, have invented a new Improvement in Printing-Presses; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of one form which a printing-press constructed in accordance with my invention may assume; Fig. 2, a broken view, in front elevation, showing the transfer-shaft and the operating connections thereof; Fig. 3, a detail view, partly in transverse section and partly in elevation, showing the transfer and gripper shafts and one of the transfer-arms and the gripper carried thereby; Fig. 4, a similar view, showing in particular the means employed for rocking the gripper-shaft on the line *a b* of Fig. 2; and Fig. 5, an enlarged plan view showing the connection between the shaft M and the lever N, whereby the lever is reciprocated.

My invention relates to an improvement in two-revolution printing-presses, the object being to provide simple, compact, and effective transfer devices having comparatively few parts and constructed with particular reference to convenience of access for attention and repair.

With these ends in view my invention consists in a two-revolution printing-press having as to its transfer devices certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention I employ a press having a two-revolution impression-cylinder A, mounted on a cylinder-shaft A', journaled in boxes A², all of any approved construction. One end of the shaft A' is projected and receives a pinion B, which meshes into a gear C, mounted upon a shaft C', also carrying a cam D, having a cam-groove D' in its outer face for the reception of an antifriction-roller E, mounted upon a pin E', carried by an arm E², offsetting from the upper edge of a rack-arm E³, hung for vertical oscillation

upon a horizontally-arranged pivot E⁴, mounted in a portion of the frame of the printing-press. The forward end of the said arm carries a segmental rack E⁵, which in turn meshes into a segmental rack F, carried by an arm F', depending from a sleeve F², rigidly secured by means of a screw F³ to one end of the transfer-shaft G, which is oscillated back and forth by the means described, whereby it derives an oscillating movement from the rotary movement of the cylinder-shaft and rocks about one hundred and sixty degrees. The said transfer-shaft G is furnished with a plurality of transfer-arms H, rigidly secured to it, and each provided with a pivotal gripper I, the lower end of which coacts, for gripping the paper, with the extreme outer end of the transfer-arm, as shown in Fig. 3. For the purpose of simultaneously operating all of the grippers I employ what I shall call a "gripper-shaft" J, which extends through all of the transfer-arms, and is provided with as many short crank-arms J' as there are grippers, the respective crank-arms being connected with the respective grippers by means of links J².

For the purpose of rocking or oscillating the gripper-shaft I provide it at one end with a lever K, Fig. 4, one end of which carries an antifriction-roller K', while the other end has pivotally connected with it a rod K², encircled by a spring K³, the opposite end of which impinges against an offset K⁴, formed upon the carrier-arm H', which is like the carrier-arms H in other respects, but designated by H' to distinguish it therefrom. The said spring K³ exerts a constant effort to swing the lever and rock the gripper-shaft J in such a manner as to engage its antifriction-roller K' with the cam-face L of a cam L', the upper end of which is slotted to adapt it to embrace the projecting outer end of the transfer-shaft. The movement of the antifriction-roller K' over the cam-face L causes the lever K to move correspondingly and rock the gripper-shaft, so as to open the grippers or move them away from the transfer-arms; but the primary function of this spring is to hold the grippers in their closed positions with respect to the said transfer-arms, as will appear later on. The said cam is located at the upper end of

an arm L^2 , rigidly secured by its lower end to a horizontally-reciprocating cam-shaft M, which has bearing in a bracket M' , secured to the machine-frame, and is engaged by the arm
 5 N of an oscillating operating-lever N' , swinging upon a fixed stud N^2 and provided with a depending antifriction-roller N^3 , entering a circumferential cam-groove O, formed in a cam O' , mounted upon the shaft C' , and there-
 10 fore driven through the medium of the gear C and pinion B from the cylinder-shaft A' . The said lever N' is also connected by means of pins n , only one of which is shown, with the cylinder-gripper pins P, which are actu-
 15 ated back and forth in the usual manner for the operation of the cylinder-grippers P' , one of which is shown by broken lines in Fig. 1. When the cam-shaft M is moved horizontally inward, the cam-face L is brought into posi-
 20 tion to coact with the antifriction-roll K' of the lever K, so as to rock the gripper-shaft J against the tension of the spring K^3 , whereby the grippers are opened. The cam-shaft M is then moved horizontally outward to clear
 25 the cam L' and its face L from the antifriction-roll K' of the lever K, whereby the said spring K^3 is allowed to reassert itself in closing the grippers.

The fly mechanism, which takes the printed
 30 sheets from the transfer mechanism, may be of any approved construction. As herein shown, it employs fly-grippers Q and Q' and comprises two fly-arms Q^2 , only one of which is shown, the said arm being constructed at
 35 its lower end with a segmental rack Q^3 , meshing into a fixed straight rack Q^4 and having what may be termed a "movable" fulcrum Q^5 , playing back and forth in a horizontal slot Q^6 , formed in a bracket Q^7 . The said
 40 fulcrum is connected by a link Q^8 with the upper end of an operating-lever Q^9 , connected by a link Q^{10} with a crank Q^{11} , driven from a main shaft Q^{12} , which is also connected by a pinion Q^{13} with a large gear Q^{14} , which drives
 45 the cylinder-shaft A' .

In the operation of the machine the oscillation of the transfer-shaft swings the transfer-grippers through an arc the ends of which are approximately represented by the points
 50 a and a' in Fig. 1. When in the revolution of the cylinder A its grippers bring the printed sheet to about the point a^2 , the transfer-grippers are presented at that point and take the sheet, after which the oscillation of the trans-
 55 fer-shaft swings the transfer-grippers around in position for the fly-grippers to take it from them at about the point a^3 . After this the transfer-grippers continue their movement and swing to the point a' , when they reverse
 60 and swing back to the point a . This movement of the grippers from the point a^3 to the point a' is required for an easy stoppage of the grippers.

I am enabled to operate my improved de-
 65 vices with rapidity, inasmuch as instead of having to rotate the transfer-grippers through an entire circle I move them only through the

arc of a circle, thus effecting an economy of time and handling the sheets less. I also se-
 70 cure an important advantage by my construction, which enables the parts of the transfer mechanism to be readily got at for attention and repair.

Still another important advantage secured by my improved combination of a single two-
 75 revolution cylinder, an oscillating transfer mechanism, and a fly is the avoidance of jamming or marring the edges of the printed sheets at the time they are delivered to the fly mechanism, this resulting from the fact
 80 that the greater speed of the cylinder is reduced and virtually conformed to the slower speed of the fly through the medium or agency of the oscillating transfer mechanism, which, so to speak, slows down the speed of the sheets
 85 from the speed of the cylinder to the speed of the fly, which, when it takes the sheets by their edges, is moving at a speed about in unison with the speed of the sheets. It may be mentioned here that at the time the trans-
 90 fer mechanism removes the printed sheets from the cylinder it is moving at about the same speed as the cylinder, but that it slows down, so that at the time it delivers the printed sheets to the fly it is moving at about the rate
 95 at which the fly is moving at that time, for it must also be remembered that the fly slows down in speed preparatory to taking the printed sheets from the transfer mechanism.

It may be noted here that the cam D is re-
 100 lied upon to actuate the oscillating transfer mechanism in the manner above stated, so that the said mechanism will act in the concert set forth with the impression-cylinder and the fly.

It is apparent that in carrying out my in-
 105 vention some changes in the construction shown and described may be made, and I have already stated that I may employ any fly mechanism which is adapted to coact with
 110 my improved transfer mechanism.

I am aware that two-revolution cylinders are old, that oscillating transfer mechanisms are old, and that oscillating fly mechanisms are old, and do not, therefore, claim any of
 115 those instrumentalities broadly. I am also aware that it is old to combine an oscillating transfer mechanism with a two-revolution cylinder and that it is old to combine an os-
 120 cillating transfer mechanism with an oscillating fly. I do not, therefore, claim either of those combinations broadly.

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

1. In a two-revolution printing-press, the combination with a single two-revolution cyl-
 130 inder, making one revolution for printing the sheet and another revolution for delivering the same; of an oscillating transfer mechanism which removes the printed sheets from the said two-revolution cylinder at a point in front of the same and near the top thereof; and a fly constructed and arranged to receive

the printed sheets directly from the said oscillating transfer mechanism at a point in front of the said cylinder, the oscillating transfer mechanism swinging beyond the point last mentioned in coming to an easy stop before it reverses, and reducing the greater speed of the cylinder to the slower speed of the fly.

2. In a two-revolution printing-press, the combination with a single two-revolution cylinder making one revolution for printing the sheet and one revolution for delivering the same; of an oscillating transfer mechanism including a transfer-shaft, means for oscillating the same, transfer-arms carried by the said shaft, transfer-grippers pivotally connected with the said arms, a gripper-shaft, and means for oscillating the gripper-shaft to operate the grippers which take the printed sheets from the said cylinder at a point in front of the same and near the top thereof; and a fly for taking the printed sheets directly from the grippers of the said oscillating transfer mechanism at a point in front of the cylinder, the oscillating transfer mechanism swinging beyond the point last mentioned so as to come to an easy stop before reversing, and reducing the greater speed of the cylinder to the slower speed of the fly.

3. In a two-revolution printing-press, the

combination with a single two-revolution cylinder provided with grippers and making one revolution for printing the sheet and another revolution for delivering the same; of oscillating transfer mechanism including a rocking transfer-shaft, transfer-arms carried by the said shaft, grippers pivotally connected to the said arms, and taking the printed sheets from the said cylinder at a point in front of the same and near the top thereof, an oscillating gripper-shaft mounted in the said arms, and a cam for oscillating the gripper-shaft; an actuating-lever operating the said cam, and also operating the grippers of the said cylinder; and a fly constructed and arranged to take the printed sheets directly from the grippers of the oscillating transfer mechanism at a point in front of the cylinder, the oscillating transfer mechanism swinging beyond the said point so as to come to an easy stop before reversing, and reducing the greater speed of the cylinder to the slower speed of the fly.

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

STURGES WHITLOCK.

Witnesses:

FRED. C. EARLE,
J. H. SHUMWAY.