

No. 661,924.

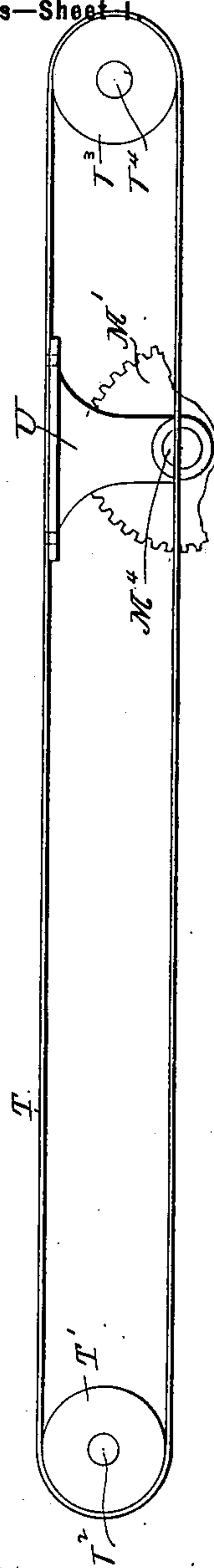
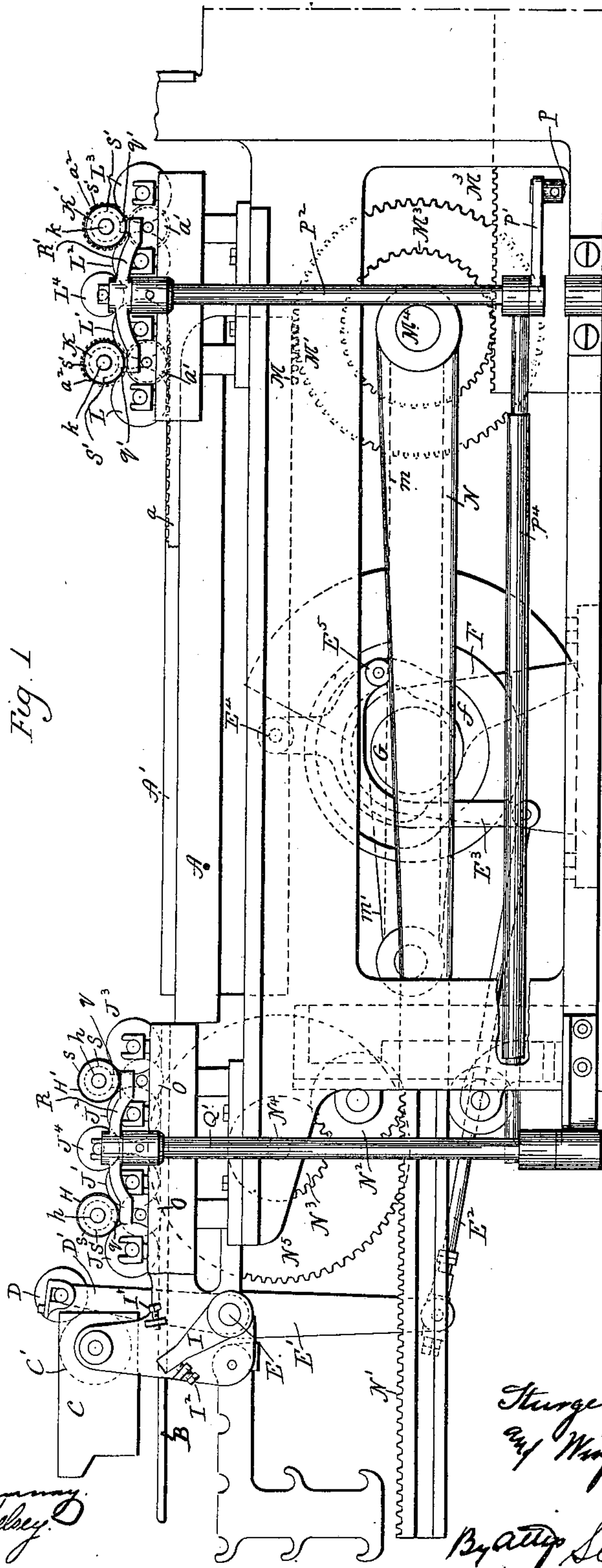
Patented Nov. 13, 1900.

S. WHITLOCK & W. S. HUSON.
FLAT BED PRINTING PRESS.

(Application filed Apr. 2, 1900.)

(No Model.)

2 Sheets—Sheet 1



Witnesses:
J. H. Shumway
Lillian D. Kelley

Sturges Whitlock
24 Winfield S. Hudson
Inventors
By ~~att~~ Seymour T. Carr

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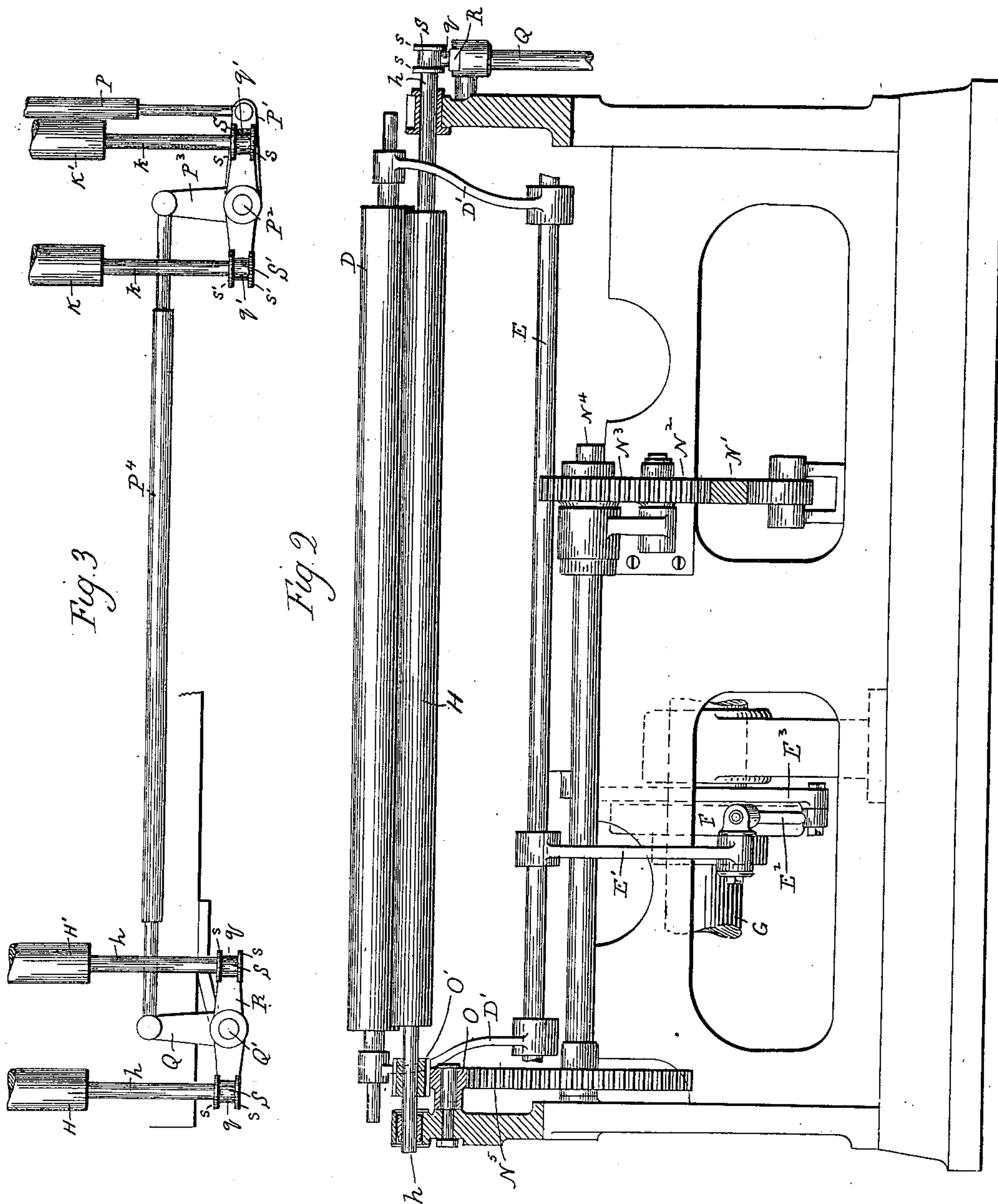
S. WHITLOCK & W. S. HUSON.

FLAT BED PRINTING PRESS.

(Application filed Apr. 2, 1900.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:
J. H. Sweeney
Lillian D. Kelby.

Sturges Whitlock
and Winfield S. Huson,
Inventors.
By atty Seymour & Carr

UNITED STATES PATENT OFFICE.

STURGES WHITLOCK, OF SHELTON, AND WINFIELD S. HUSON, OF DERBY,
CONNECTICUT, ASSIGNORS TO THE WHITLOCK PRINTING PRESS MANU-
FACTURING COMPANY, OF DERBY, CONNECTICUT.

FLAT-BED PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 661,924, dated November 13, 1900.

Application filed April 2, 1900. Serial No. 11,054. (No model.)

To all whom it may concern:

Be it known that we, STURGES WHITLOCK, of Shelton, in the county of Fairfield, and WINFIELD S. HUSON, of Derby, in the county of New Haven, State of Connecticut, have invented a new Improvement in Flat-Bed Printing-Presses; and we 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 partial view, in front elevation, of a flat-bed printing-press embodying our invention; Fig. 2, a view thereof, partly in elevation and partly in vertical transverse section, through the rollers of the "plate-inking" series of rollers; Fig. 3, a detail plan view showing the means employed for the lengthwise vibration of the distributor rider-rollers of the plate-inking series and of the "type or form inking" series; Fig. 4, a view in side elevation, showing a modification of the means employed to rotate the rollers of the plate-inking series.

Our invention relates to an improvement in that class of flat-bed printing-presses employing a reciprocating type or form bed provided with an ink-plate adapted to receive ink from a suitable source of supply and to transmit it to a series of rollers from which the type or form receives its ink.

The objects of our present invention are to simplify such presses and make them more compact, to increase their durability and their convenience of attention and repair, and more particularly to better distribute throughout the machine the power for operating the same, and to secure a more perfect distribution of the ink.

With these ends in view our invention consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out our invention as herein shown it is applied to a flat-bed printing-press in which the type-bed is reciprocated in the manner shown and described by United States Patent No. 560,180, granted May 12,

1896, to Sturges Whitlock; but we do not limit ourselves to applying our present invention to a press embodying the construction shown by that patent.

As herein shown, the reciprocating type or form bed A, carrying the type or form A', is provided at its outer end with a horizontal ink-plate B, which is moved back and forth in the reciprocation of the bed A under a series of rollers, which for convenience we will speak of collectively as the "plate-inking" series to distinguish them from the group of rollers located at the inner end of the bed and to be collectively called the "type or form inking" series. The ink is placed in a suitable ink-fountain C, located at the "fountain end" of the press, as it is commonly called, and containing an immersed feed-roller C', to which a step-by-step movement is imparted by suitable ratchet-and-pawl mechanism (not shown) and which delivers the ink in fractional quantities to the surface of the transfer-roller D, which is journaled in bearings located at the upper ends of two corresponding arms D', only one of which is shown. These arms are secured at their lower ends to a rock-shaft E, oscillated by a depending lever E', the lower end of which is connected by an adjustable connecting-rod E² with the lower end of a cam-lever E³, hung from the frame of the machine upon a pivot E⁴ and provided with an antifriction-roller E⁵, running in a cam-groove f, formed in the transfer-roller cam F, which is mounted upon the main shaft G of the machine. Through the action of the cam F, cam-lever E³, connecting-rod E², lever E', and rock-shaft E the arms D', and hence the transfer-roller D, are oscillated back and forth, so as to cause the transfer-roller to travel between the feed-roller C' in the fountain C and the distributor rider-roller H, which will be described later on and which is one of the plate-inking series of rollers. In order to limit the oscillating movement of the transfer-roller and to provide a firm stop for it at each end of its oscillating movement, we mount a stop-lever I upon the rock-shaft E and locate in lugs upon the frame of the machine two set-screws I¹ and I², which are engaged by the lever at the ends of its swing-

ing movement. It will be clear that by suitably adjusting the set-screws I' and I² the transfer-roller may be stopped in its oscillating movement in any desired relation to the feed-roller C' and to the distributor rider-roller H.

The distributor-roller H before referred to is one of a pair of distributor rider-rollers H and H', the roller H riding upon two composition rollers J and J', and the roller H' riding upon two corresponding composition rollers J² and J³, and the composition rollers J' and J² being virtually connected for the transmission of ink from the former to the latter by means of an intermediate metal roller J⁴. These several rollers collectively form what we have heretofore termed the "plate-inking" series and are all located at a right angle to the path in which the type-bed A reciprocates. Their function is to transmit the ink received from the fountain C to the ink-plate B, from which the ink is transferred to the so-called "type or form inking" series, which is located near the center of the press and which is composed of two distributor rider-rollers K and K', two composition rollers L and L', upon which the roller K rides, two composition rollers L² and L³, upon which the roller K' rides, and a metal roller L⁴, virtually uniting the rollers L and L' for the transmission of ink from one to the other. These rollers constituting the type or form inking series are also located at a right angle to the path in which the type-bed reciprocates and transmit the ink which they receive from the ink-plate to the type or form A'.

It will be understood, of course, that in the reciprocation of the type-bed A the ink-plate passes first under the rollers of the type or form inking series of rollers and gives up its ink to them, and they in turn give up the ink to the type or form as it passes under them in the reciprocation of the bed in the opposite direction.

The distributor rider-rollers H and H' of the plate-inking series and the corresponding rollers K and K' of the type or form inking series are actuated in rotation by power derived not from the type-bed, as is often done in machines of this class, but from the mechanism employed to reciprocate the type-bed, which, as shown herein, is provided upon its under surface with a rack M, meshed into by a traveling gear M', provided with a pinion M², meshing into a fixed rack M³, upon which the said pinion travels back and forth under the action of a pitman m, connected at its rear end to the shaft M⁴ of the traveling gear M' and at its forward end to a crank m' upon the main shaft G, whereby, as set forth in the patent before referred to, the movement of the type-bed is compounded and made greater than the resultant of the crank movement. Upon the said shaft M⁴ of the traveling gear M' we mount a long rack-bar N, extending forward under the fountain end of the press and provided with a roller-actu-

ating rack N', meshing into a pinion N², which meshes into a pinion N³, mounted upon a shaft N⁴, which extends to one side of the machine and carries a large driving-gear N⁵, meshing into small gears O O (shown by broken lines in Fig. 1 and by full lines in Fig. 2) and themselves meshing into gears O', Fig. 2, located upon the inner ends of the shafts h of the distributor rider-rollers H and H', which rotate the composition rollers J, J', J², and J³ by frictional contact therewith, the intermediate metal roller J⁴ being rotated by frictional contact with the rollers J' and J². The said rack-bar N together with its rack N' constitute a reciprocating prime mover for the rotation and reversal of the rollers of the plate-inking series. Under this construction the distributor rider-rollers H and H' of the plate-inking series are rotated continuously in one direction throughout the excursion of the type-bed in one direction and then after a short period of rest are continuously rotated in the opposite direction throughout the excursion of the type-bed in the opposite direction, the said rollers being reversed in the direction of their rotation to correspond to the direction of the movement of the type-bed.

It follows from the construction and operation above described that the rollers H and H' will not be rotated during the short interval of time elapsing between the inking and the printing excursions of the type-bed, but will be at rest, and this period during which the said rollers are at rest is utilized for transferring the ink from the transfer-roller D to the distributor rider-roller H. For this purpose the transfer-roller cam F is constructed and timed so that the transfer-roller D will not only be brought into contact with the roller H while the same is at rest, but will leave the said roller while the same is at rest, so that the transfer-roller will not be set in motion by the roller H, but will return to the feed-roller C' in a state of rest. In this way we are enabled to dispense with the use of friction-brakes or other means for preventing the transfer-roller from "wiping" the feed-roller by being brought into contact with it while rotating, which results also in impairing the surface of both rollers. We may also explain that the transfer-roller D is brought into contact with the distributor rider-roller H just after the ink-plate B in the forward or printing excursion of the type-bed A has cleared the composition roller J', so that the ink placed upon the roller H by the transfer-roller will be evenly distributed throughout the series of plate-inking rollers by the rotation thereof during the remainder of the forward or printing excursion of the type-bed and during so much of the rearward or plate-inking excursion thereof as takes place before the ink-plate comes in contact with the roller J³.

The actuation of the rollers of the type or form inking series is effected by means en-

tirely independent of the means employed for
 actuating in rotation the rollers of the plate-
 inking series and comprising a rack a , con-
 nected to the type-bed A and meshing into
 5 pinions $a' a'$, which in turn mesh into pinions
 $a^2 a^2$, mounted upon the shafts $k k$ of the dis-
 tributer rider-rollers K K', the positive rota-
 tion of which is frictionally communicated to
 the other rollers of the series, whereby they
 10 are driven. It will be understood, of course,
 that the rollers K and K' and the other rollers
 of the series to which they belong will be re-
 versed in the direction of their rotation to
 correspond to the direction in which the rack
 15 is moving as it is reciprocated. In prior ma-
 chines the rack employed to drive the type or
 form inking rollers has also been utilized to
 drive the rollers of the plate-inking series.
 When a rack is employed, as described, for
 20 driving the plate-inking series as well as the
 type or form inking series of rollers, it must
 be not only as long as the full run of the type-
 bed, but enough longer than that run to keep
 in mesh with the pinions of the rollers of the
 25 two series. In our improved machine, how-
 ever, as we do not drive the plate-inking se-
 ries directly from the type-bed, but from the
 type-bed-driving mechanism, which is shorter
 in stroke, the rack N', already described, need
 30 be but a trifle longer than the crank-stroke
 of the machine.

The vibration or lengthwise movement of
 the rollers H and H' of the plate-inking series
 and the rollers K and K' of the type or form
 35 inking series is effected by means of a suit-
 ably located and driven cam, which is not
 shown, but which is employed to actuate the
 connecting-rod P, attached to the arm P' of
 a bell-crank lever, mounted upon the lower
 40 end of an upright rock-shaft P², which is em-
 ployed for the vibration of the distributor
 rider-rollers K and K', as will be described
 later on. The other arm P³ of the said bell-
 crank lever is connected with the inner end
 45 of a long horizontally-arranged connecting-
 rod P⁴, the opposite end of which is connected
 with a lever Q, mounted upon the lower end
 of an upright shaft Q', provided at its upper
 end with a two-armed lever R, the ends of
 50 the arms of which are provided with antifric-
 tion-rollers q , which enter between the flanges
 $s s$ of small flanged wheels S, located upon
 the extreme forward ends of the shafts $h h$ of
 the distributor rider-rollers H and H'. The
 55 upper end of the rock-shaft P² is furnished
 with a corresponding two-armed lever R', the
 extreme ends of the arms of which are fur-
 nished with small antifriction-rollers $q' q'$,
 which are entered between the flanges $s' s'$ of
 60 flanged wheels S', located at the extreme for-
 ward ends of the shafts k of the distributor
 rider-rollers K K'. It will be understood from
 the foregoing description that by means of
 these operating connections the rollers H and
 65 H' and K and K' will be longitudinally recip-
 rocated or vibrated at the same time they are

rotated, the two-armed levers R and R' being
 for this purpose oscillated within narrow lim-
 its in a horizontal plane; but what we par-
 ticularly wish to call attention to in this con- 7c
 nection is the fact that the mechanisms em-
 ployed for vibrating the distributor rider-
 rollers of the two series are coupled together
 for simultaneous operation.

In place of employing the rack-bar N' for 75
 the actuation of the pinion N², by means of
 which the rollers of the plate-inking series
 are driven and reversed in the direction of
 their rotation, we may, if we prefer, employ
 such a modified construction as is shown in 80
 Fig. 4, in which a belt T takes the place of
 the rack-bar, this belt being at one end passed
 over a pulley T', mounted upon the shaft T²,
 upon which the pinion N² is mounted, as shown
 in Fig. 1. The other end of this belt passes 85
 over an idle pulley T³, mounted upon a stud
 T⁴, located at any convenient point in the
 frame of the machine. A portion of this belt
 has secured to it a block U, which is connected
 with the projecting end of the shaft M⁴ of the 90
 traveling gear M', which as it travels back
 and forth causes the block U to partake of
 its movement, and hence actuates the belt
 first in one direction and then in the other,
 so as to cause a reverse rotation of the pulley 95
 T' and all of the connections thereof.

We would therefore have it understood that
 we do not wish to limit our invention to the ex-
 act construction herein shown and described,
 but hold ourselves at liberty to make such 100
 changes and alterations as fairly fall within
 the spirit and scope of our invention.

Having fully described our invention, what
 we claim as new, and desire to secure by Let-
 ters Patent, is— 105

1. In a flat-bed printing-press, the combi-
 nation with a reciprocating type-bed, of an
 ink-plate carried thereby, a series of plate-
 inking rollers, a reciprocating prime mover
 for the plate-inking rollers, and gearing in- 110
 terposed between and connecting the said re-
 ciprocating prime mover and the plate-ink-
 ing rollers, whereby the same are rotated, and
 reversed in rotation in unison with the recip-
 rocation of the type-bed, which is thus relieved 115
 of the work of driving the plate-inking rollers.

2. In a flat-bed printing-press, the combi-
 nation with a reciprocating type-bed, of an
 ink-plate carried thereby, means for recipro-
 cating the said type-bed, a series of plate-ink- 120
 ing rollers, a reciprocating prime mover for
 the plate-inking rollers connected with and
 actuated by the means for reciprocating the
 type-bed, and gearing interposed between the
 said prime mover and the plate-inking rollers 125
 for rotating them, and reversing them in uni-
 son with the reciprocation of the type-bed,
 whereby the same is relieved of the work of
 driving the said rollers.

3. In a flat-bed printing-press, the combi- 13c
 nation with a reciprocating type-bed, of an
 ink-plate carried thereby, a series of type or

form inking rollers, means for driving the same from the type-bed, a series of plate-inking rollers, a reciprocating prime mover for the plate-inking rollers, having less reciprocating movement than the type-bed, and gearing between the said reciprocating prime mover and the rollers of the plate-inking series which are thereby rotated, and reversed in unison with the reciprocation of the type-bed.

4. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, a series of plate-inking rollers, a reciprocating prime mover for the plate-inking rollers, gearing between the said prime mover and the plate-inking rollers which are rotated, and reversed in unison with the reciprocation of the type-bed, a series of type or form inking rollers, and means independent of the said prime mover for rotating and reversing the form-inking rollers.

5. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, a series of plate-inking rollers, a reciprocating prime mover therefor, gearing between the said prime mover and the plate-inking rollers, which are rotated, and reversed in unison with the reciprocation of the type-bed, a series of type or form inking rollers driven independently of the said reciprocating prime mover, and means common to both series of rollers for simultaneously actuating their distributor-rollers in lengthwise vibration without interfering with their independently-actuated rotation.

6. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, a series of plate-inking rollers, a reciprocating prime mover therefor, gearing between the said prime mover and the plate-inking rollers, which are thus rotated, and reversed in unison with the reciprocation of the type-bed, a series of type or form inking rollers rotated and reversed independently of the action of the said reciprocating prime mover, an upright rock-shaft having its upper end connected with the rider roller or rollers of the plate-inking series of rollers, an upright rock-shaft having its upper end connected with the rider roller or rollers of the form-inking series of rollers, and means connecting the two rock-shafts for operating them simultaneously, whereby the rider roller or rollers of both series are simultaneously actuated in lengthwise vibration.

7. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, a series of plate-inking rollers comprising two distributor rider-rollers, a reciprocating prime mover therefor, gearing between the said prime mover and the plate-inking rollers which are rotated and reversed in rotation in accordance with the reciprocation of the type-bed, a series of type or form inking rollers com-

prising two distributor rider-rollers, means for rotating and reversing the said form-inking rollers independently of the said prime mover, two upright rock-shafts respectively located adjacent to the respective series of rollers, means for oscillating the said shafts simultaneously, and two two-armed levers respectively mounted upon the upper ends of the said rock-shafts and connected with the distributor rider-rollers of the said two series of rollers, whereby the rider-rollers of both series of rollers are simultaneously actuated in lengthwise vibration.

8. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, a series of plate-inking rollers, means for reciprocating the type-bed, a reciprocating rack-bar carrying a rack and reciprocated independently of the said type-bed by the said means, and gearing between the said rack and the rollers of the plate-inking series which are thereby rotated and reversed in rotation in unison with the reciprocation of the type-bed.

9. In a flat-bed printing-press, the combination with a series of plate-inking rollers, of a transfer-roller adapted to receive ink from a source of supply, and to transfer the same to a roller of the said series, and means for moving the transfer-roller from its receiving to its discharging position and vice versa, the said means being timed to move the transfer-roller from its discharging to its receiving position in a state of rest as to rotation.

10. In a flat-bed printing-press, the combination with a series of plate-inking rollers including a distributor rider-roller, of an ink-fountain, a transfer-roller adapted to receive ink from the said fountain and transfer it to the said distributor rider-roller, and means for actuating the said roller, whereby it is moved from contact with the said distributor-roller while the same is in a state of rest as to rotation, so that the said transfer-roller is returned to the said ink-fountain in a state of rest as to rotation.

11. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, a distributor-roller, means for actuating the same and reversing the direction of its rotation to correspond to the reversal of direction in the movement of the type-bed, an ink-fountain, a transfer-roller adapted to receive ink from said fountain and transfer it to the said distributor-roller, and means for operating the said transfer-roller and timed to cause the same to break contact with the distributor-roller, while the same is in a state of rest as to rotation, and while the type-bed is also at rest.

12. In a flat-bed printing-press, the combination with a reciprocating type-bed, of an ink-plate carried thereby, an ink-fountain, a series of plate-inking rollers including a distributor rider-roller, a transfer-roller adapted to receive ink from the fountain and transfer

it to the said rider-roller, and means for moving the said transfer-roller back and forth between the fountain and the said rider-roller, the said means being timed to cause the transfer-roller not to break contact with the said rider-roller except when the same is in a state of rest, whereby the transfer-roller reaches the ink-fountain in a state of rest and returns to the said rider-roller in a state of rest, without the employment of braking appliances.

In testimony whereof we have signed this

specification in the presence of the subscribing witnesses.

STURGES WHITLOCK.
WINFIELD S. HUSON.

Witnesses for Sturges Whitlock:

J. M. CRAVER,
L. R. FERNALD.

Witnesses for Winfield S. Huson:

JULIUS G. DAY,
WALTER RANDALL.