

No. 708,878.

Patented Sept. 9, 1902.

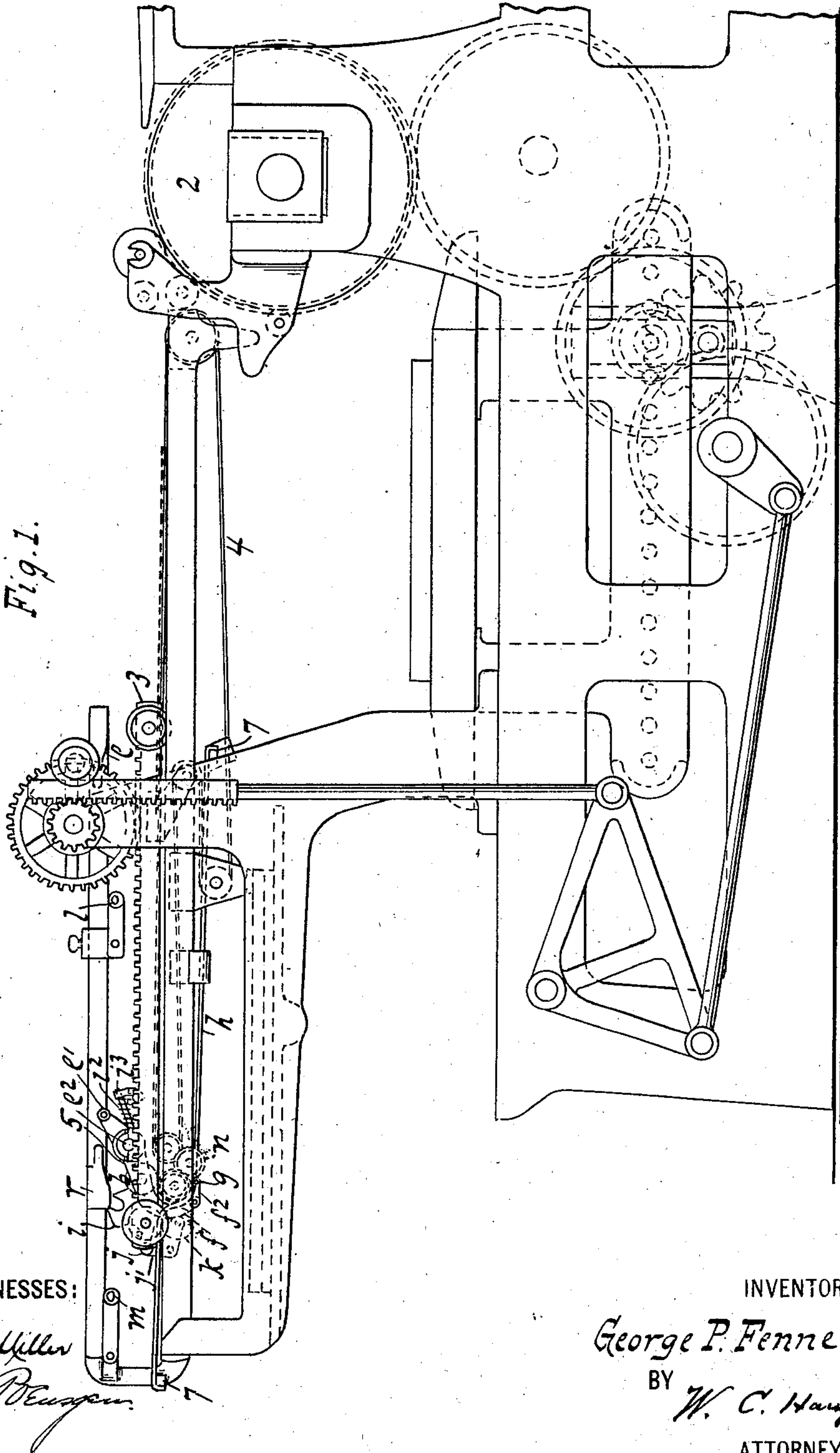
G. P. FENNER.

SHEET DELIVERY FOR PRINTING PRESSES.

(Application filed Apr. 12, 1902.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

William Miller

C. E. Pearson

INVENTOR

George P. Fenner

BY

W. C. Hauff

ATTORNEY

No. 708,878.

Patented Sept. 9, 1902.

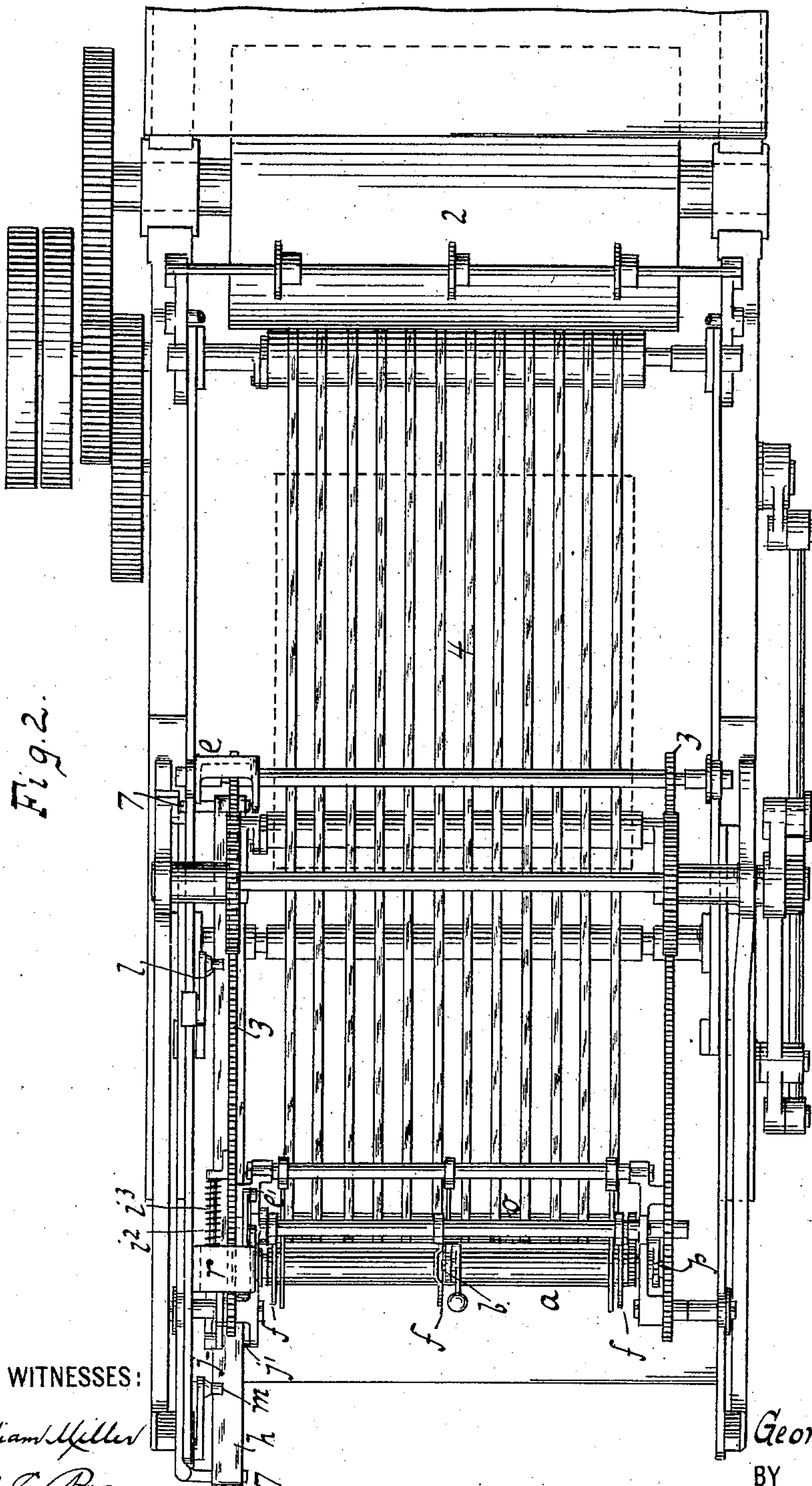
G. P. FENNER.

SHEET DELIVERY FOR PRINTING PRESSES.

(Application filed Apr. 12, 1902.)

(No Model.)

4 Sheets—Sheet 2.



WITNESSES:

William Miller

C. E. Fenner

INVENTOR

George P. Fenner

BY

W. C. Hauff

ATTORNEY

No. 708,878.

Patented Sept. 9, 1902.

G. P. FENNER.

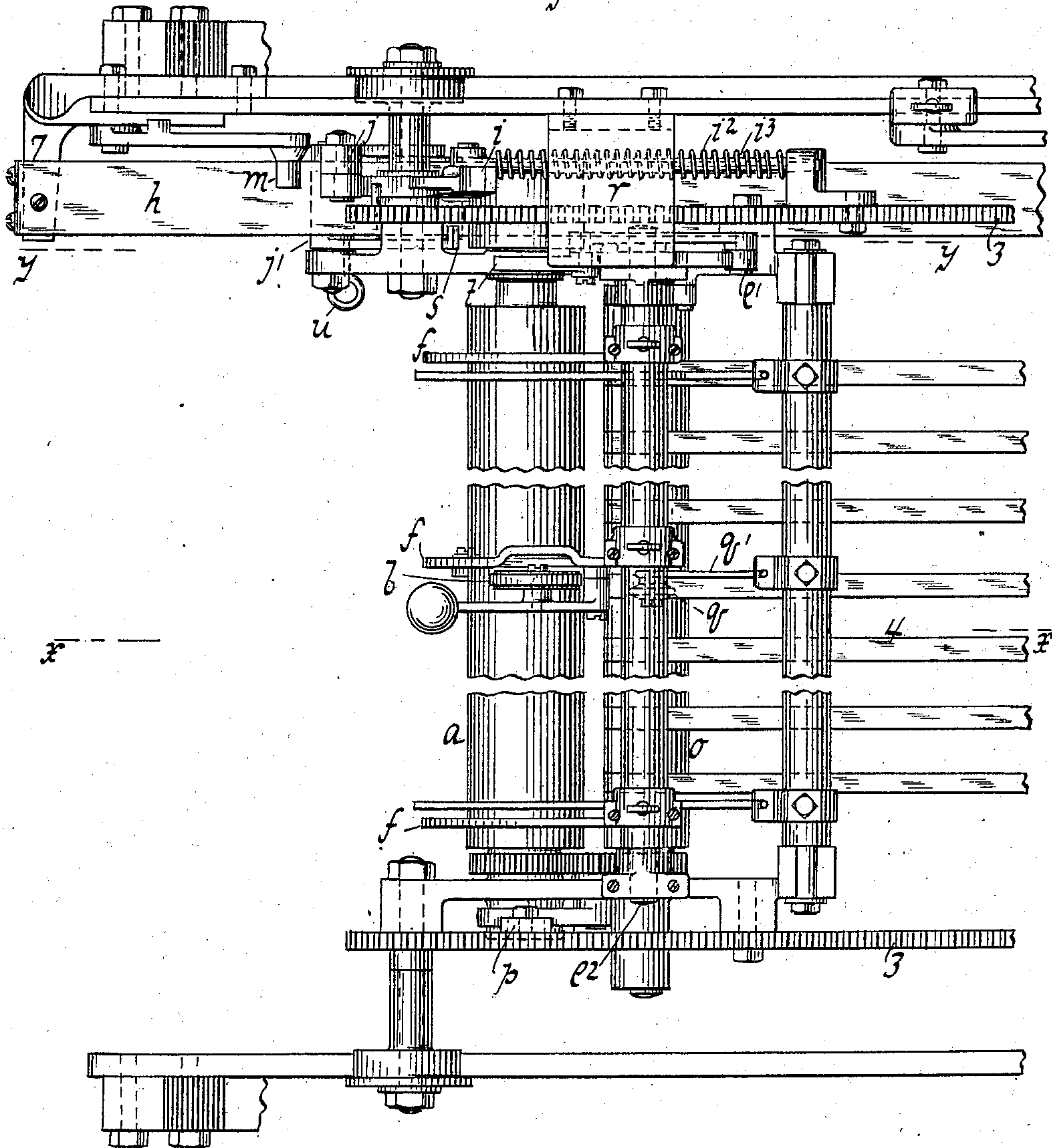
SHEET DELIVERY FOR PRINTING PRESSES.

(Application filed Apr. 12, 1902.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 3.



WITNESSES:

William Miller
C. E. Fenner

INVENTOR

George P. Fenner

BY

W. C. Hauff

ATTORNEY

No. 708,878.

Patented Sept. 9, 1902.

G. P. FENNER.

SHEET DELIVERY FOR PRINTING PRESSES.

(Application filed Apr. 12, 1902.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 4.

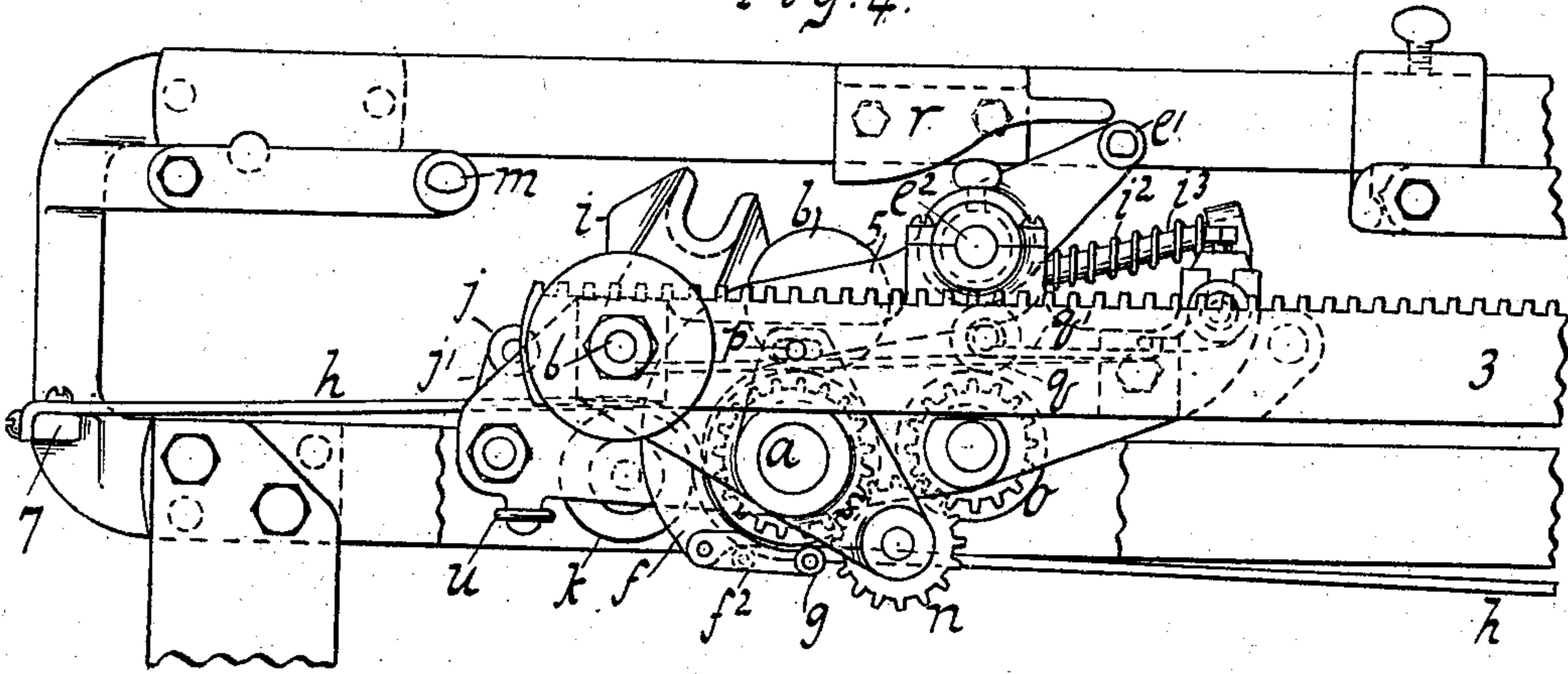


Fig. 5.

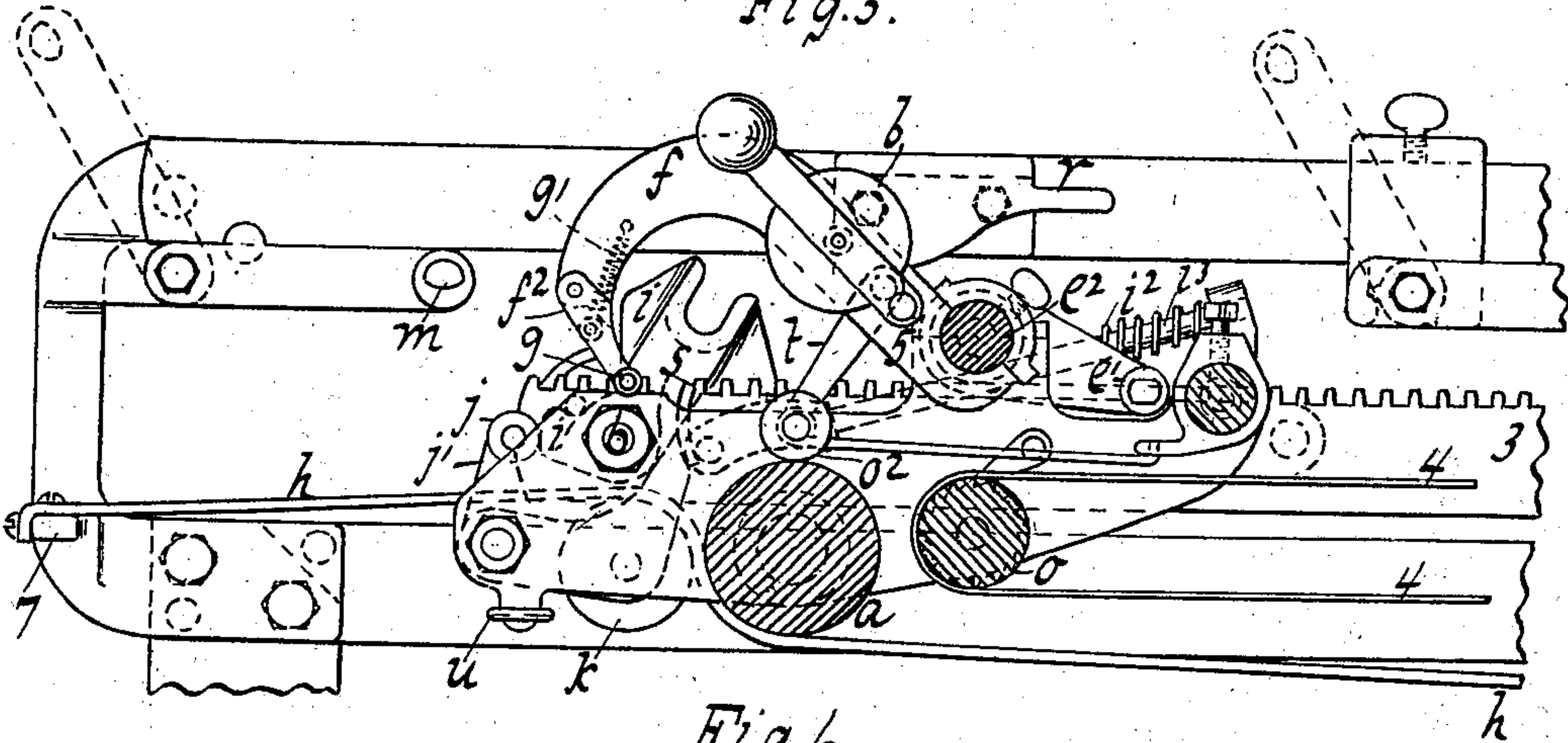
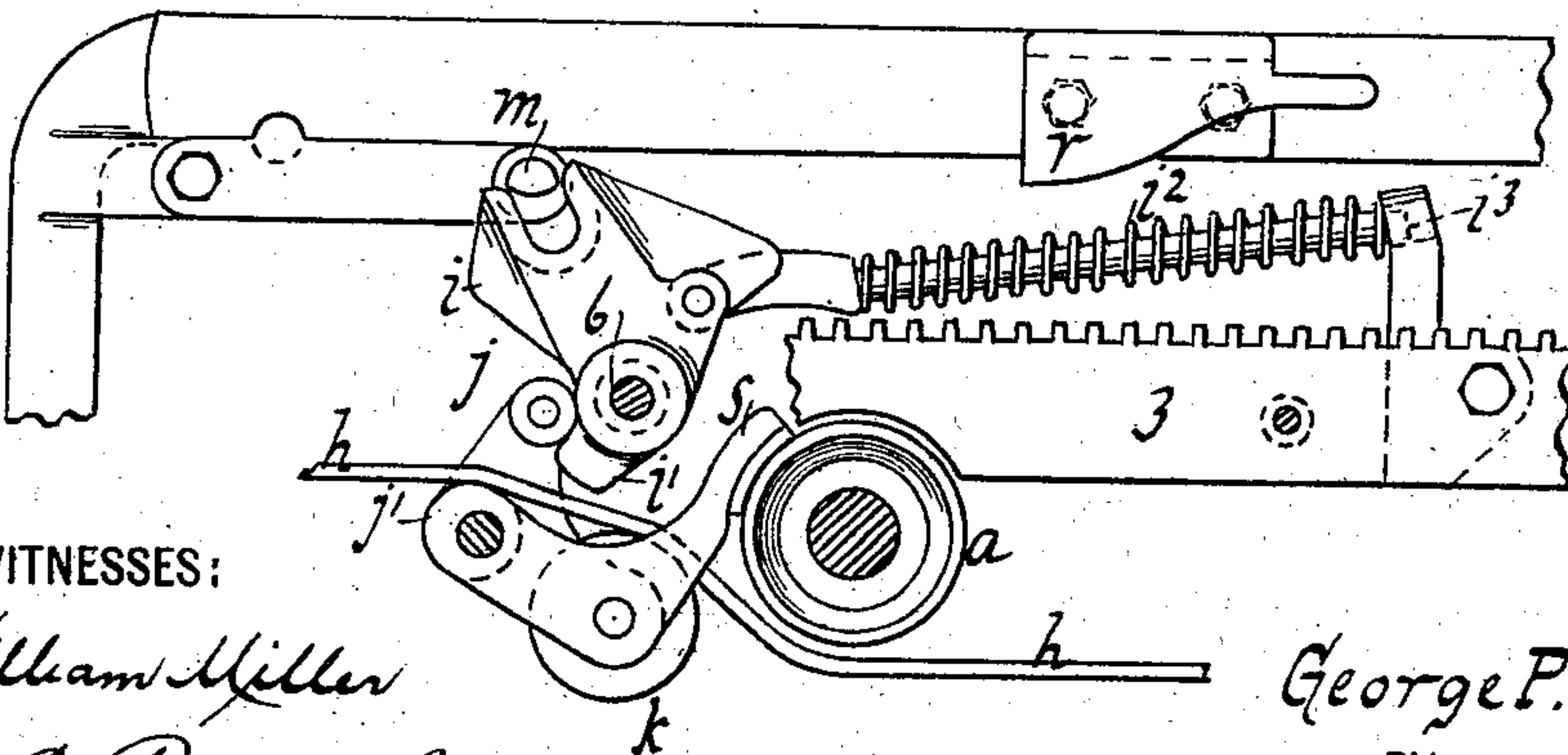


Fig. 6.



WITNESSES:

William Miller
C. E. Pausgen

INVENTOR

George P. Fenner

BY

W. C. Hauff
ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE P. FENNER, OF NEW LONDON, CONNECTICUT.

SHEET-DELIVERY FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 708,878, dated September 9, 1902.

Application filed April 12, 1902. Serial No. 102,614. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. FENNER, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented new and useful Improvements in Sheet-Deliveries for Printing-Presses, of which the following is a specification.

This invention relates to a manner of delivering sheets printed side down, and the delivery mechanism forming the subject of this invention embodies new features of construction set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 is a side elevation of a sheet-delivery apparatus embodying this invention. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a view of part of Fig. 2 enlarged, showing the front portion of the tape-carriage. Fig. 4 is a side elevation of a curler with front roller and adjacent mechanism. Fig. 5 is a section along xx , Fig. 3. Fig. 6 is a section along yy , Fig. 3.

In the drawings is shown an impression-cylinder 2 and tape-carriage 3, which reciprocates and the tapes 4 of which are arranged so that their top side or stretch remains stationary or without motion when the carriage is moving back or toward the impression-cylinder. This arrangement of tape and carriage is known in the art and need not be described here. (See, for example, United States Patents No. 335,066, granted January 26, 1886, and No. 506,990, granted October 17, 1893, both for sheet-delivery apparatus.) This delivery-carriage is fitted with a delivery or turning roll a at its front end or portion, which roll is made to act intermittently—that is, said roll revolves during the process of delivering the sheet—and the drop-wheels b being suitably or carefully set the sheet will be started square. Said roll a has no rotary motion and remains stationary with the top stretch of the tapes during the return of the carriage. An arrangement for giving intermittent rotation to roll a will be presently described.

The drop-wheels b are journaled in or actuated by a lever or arms 5, having fulcrum or shaft at e^2 and the end or friction roller e' of which is made to pass to or be actuated by

cams e and r as the carriage comes to its back or front position. The drop-wheels are thus at these points raised or out of action and up or clear from the front roller a . The curler-fingers f , also attached to shaft e^2 , extend about roll a and cause the sheet to bend or bring its printed side down. An extension or auxiliary finger f^2 on the curlers, or rather on the lower end of the middle curler-finger f , is shown provided with one or more friction-wheels g . These small wheels g are kept in contact with delivery-roll a by spring g' , Fig. 5.

The mechanism shown for causing intermittent rotation of roller a comprises a belt or strap h , which is stationary or fixed at its ends to points or blocks 7 and is mounted independently of the carriage. When slack, the strap is inactive, but when tightened or suitably engaging the roller a the friction or hold of the strap will cause rotation of the roll as the carriage moves. The idler-roll k when suitably pressed to or engaging the strap will tighten the latter for rotating roll a . This roll k is mounted on lever j' , having roller j for engagement by cam or shoulder part i' , Figs. 5 and 6, of tumbler i . The tumbler i is moved or snapped one way or another about its bearing or pivot 6 by engaging or being tripped by pins l and m as the tape-carriage reciprocates. The spring i^2 or its rod i^3 will hold the tumbler in the position into which it has been thrown until tripped or returned by engagement with one of the pins. Say the carriage is back to the limit of its travel and the pin l rests in the engaging recess or pin-seat shown at the upper part of the tumbler. Then as the carriage moves forward the tumbler is moved to carry or press its cam i' to roller j and press lever j' , with roller, to the strap and tighten the latter. At the end of the forward stroke of the carriage the pin m engages the tumbler, so that on the back movement of the carriage the tumbler is tripped for its cam i' to drop from or release roll j with lever j' , and roll k will free or allow slackening of the strap.

The action of the delivery apparatus is as follows: The sheet runs from the impression-cylinder out or forward onto the tape. The head end of the sheet comes to a stop or temporary rest below or slightly forward of the

cam *e*. The sheet rests stationary in this position while the carriage with the turning device moves back toward the impression-cylinder. The roll *a* comes into position under the sheet somewhat back of its head or leading edge. The friction-roll *e'*, passing under cam *e*, will by shaft *e*² raise the drop-wheels *b* and curlers *f*. On the start of the carriage forward the roller *e'* clears the cam *e*, and the curlers *f* drop into position, also allowing wheels *b* to lie of their own weight on the surface of the sheet supported by roll *a*. These wheels *b* are set in the margins, and their efficiency or weight can be adjusted or increased by overweights or an extension on the lever carrying the wheels *b* and which lever can have a ball or weight applied to its end. As the carriage moves forward with the parts in this position set forth the sheet goes with the carriage, and the top tape or stretch moves in the same direction as such carriage. The sheet, tape, and turning devices are all intended to move at the same speed. The carriage moving forward and the tumbler being tripped or coming into contact with tumbler-pin *l*, the idler-wheel *k* is thrown into position to tighten the strap or stationary belt *h* and impart rotary motion to roll *a*, making the top of this roll move in the same direction with the delivery-carriage, but twice as fast. The roll *a* thus revolving the sheet is carried ahead and drawn off the tapes by the action of this roll in connection with drop-wheels *b* and deposited onto the delivery-board, printed side down. At the forward end of the travel of the delivery-carriage the friction-roll *e'* passes under stationary cam *r*, so as to raise the curler *f* and their extensions *f*² a suitable distance and bringing roll *g* away or clear from the tail end of the sheet, so that the latter will always pass away or out from roll *g*, even if allowance has to be made for some irregularity in the running of the sheet. This arrangement allows for carelessness in feeding or for certain variations in the movement of the sheet on the delivery-tape, so that the sheet will not be caught and carried back or snarled up because of failure to run out from between rolls *a* and *g*. The rolls *g* have been found serviceable, for example, in delivering thin paper, as they tend to put a certain longitudinal crease or bend in the paper, thus preventing the outgoing head end of the sheet from throwing over onto itself and being delivered in a roll instead of flat. It has been found by experiment that when the sheet is forced or run quickly about roll *a* and the rolls *g* are not used such sheet has a tendency to run down nearly to the delivery-board and curl up into a roll or roll shape. The employment of rolls *g*, as stated, prevents or overcomes this tendency. It has also been found that curlers without rolls *g* should be used in the side or outer margins of the sheet and that drop-wheels *b* should not be used at the outer lines or margins, as they tend to cause the edge of the sheet to ruffle and not deliver smoothly.

The opposite effect is produced when these wheels are applied or used along the central lines or portion. In other words, friction-wheels cannot be used in the outer margins unless the paper is very heavy, so that it can be practically stated that these wheels should be used only in the middle portions. As the tail end of the sheet is dropped onto the delivery-board the tumbler passes or presses past or under tumbler trip-pin *m*, and the carriage thereupon starts its return motion toward the impression-cylinder. The pin *m* acting upon or tripping the tumbler causes the idler-roll *k* to be freed or thrown out of action. The roll *a* is thus stopped, and the carriage moves back to bring another sheet forward. The trip-pin *m*, it is noted, could be omitted, as the sheet in most, if not all, cases will be properly delivered, even if roll *a* revolves on the back stroke of the carriage, since as soon as the tumbler *i* comes into contact with the pin *l* on the back stroke the tumbler is tripped to throw idler *k* out of action and stop rotation of roll *a* before it comes into contact with the sheet on the delivery-tape. On the carriage then again starting forward the pin *l* again trips or returns the tumbler to force roller *k* back into action for the belt *h* to actuate roller *a*.

The tumbler-pins *l* and *m* could be movably mounted—as, for example, on an elbow-joint or arm—so as to be swung up or thrown out of reach of tumbler *i*, and the idler-roll *k* having been put out of action the roll *a* remains permanently at rest or non-rotating. Tumbler-pin *l* is shown adjustable along the supporting frame or bar for different sizes of sheets and when adjusted is held in position by a clamp or screw.

The brake *s*, Fig. 6, is adapted to act on roll *a* or on one edge of the surface of a pulley on the end of said roll and hold the latter steady. This brake can be fulcrumed in common with the belt-tightening lever *j'* and made to alternate therewith, so that when strap *h* is loose or free from the roll *a* the brake *s* will act thereon.

When it is desired to deliver printed side up, the curlers *f* are thrown clear or moved up or out of action, and can be thus held by suitable means, such as a prop or dog *t*, Fig. 5, which can brace its free end in a notch or supporting-point in the frame or other serviceable part.

It has been found desirable to have drop-wheels *b* lie of their own weight on roll *a*, as setting of these rolls so they will all press evenly with the same pressure on the sheet is difficult, and in case the pressure is uneven the sheet is wrinkled and not properly delivered. The bearing of drop-roll *b* can be formed by a screw, the head of which is made to rest above and partly in a seat or notch in curler *f*. As soon as the curler is raised slightly it catches this screw-head of drop-roll *b* and moves this roll up with the curler.

In the drawings, Fig. 4, is shown a gear *n*

attached to a frame or bearing made to swing concentric with shaft of roll *a*, so that it can be held or set into or out of contact with tape-roll *o*. A suitable clamp-screw *p* can be made to fix the gear as set. This mechanism does not apply to the turn-down delivery, but is simply a mechanism for imparting to roll *a* the same motion as roll *o* by throwing roll *k* out of action and allowing roll *n* to have control of roll *a*, so that the latter receives its motion from roll *o* by means of gear *n*. This arrangement is for printed-side-up delivery and is convenient, as the friction-wheels *q*, attached to delivery-fingers *q'*, may be set at the margins of the sheet to control its action while being delivered printed side up. As the roll *o* has tape about its surface at certain intervals, it is not a satisfactory surface for dropping friction-wheels *q'* onto, as it tends to flute the sheet and cause it to run unevenly, at any rate with some, if not all, grades of paper. It is therefore desirable to have roll *a* when the delivery is printed side up move exactly with the carriage or tape-roll, so that friction-wheels *o*², Fig. 5, may be used on the surface of roll *a* and be pressed firmly into contact with the surface thereof without bending or deflecting the surface of the sheet which is to be delivered. The gear *n* when thrown into contact with roll *o* at once imparts motion to roll *a*. When roll *a* is being driven by roll *o* and gear *n*, the idler-roll should be suitably raised—that is, sufficiently for brake *s* not to rest on the edge of pulley on end of roll *a*—so that this brake is idle when roll *a* is geared to roll *o*. A pin or holder *u* can be applied to raise roll *k* and brake *s* or hold the same clear. Said pins can be slipped into any suitable seat or perforation provided therefor at a proper point.

What I claim as new, and desire to secure by Letters Patent, is—

1. A delivery apparatus for printing-machines comprising a reciprocating tape-carriage provided at its front end with an intermittently-operating delivery-roll, and a roll-driving or friction-strap mounted independently of the carriage and made to be slackened at suitable intervals to permit the roll to remain stationary during the return of the carriage.

2. A tape-carriage having an intermittently-acting delivery-roll in advance of the tape, starting or drop wheels for the roll, a lifter or cam for moving the drop-wheels out of action, and a friction-strap for causing the operation of the roll, said strap being secured at its ends independently of the carriage and made to slacken at suitable intervals to leave the roll idle on the return of the carriage.

3. A tape-carriage having an intermittently-acting delivery-roll in advance of the tape, starting or drop wheels for the roll, a curler having a roll held against the said roll, and a lifter or cam for moving the drop-wheels and curler with its roller out of action.

4. A delivery apparatus for printing-machines comprising a reciprocating carriage provided with an intermittently-acting front or turning roll, and a curling-finger extended about the roll and having an extension provided with friction-rollers extended under the roll.

5. A delivery apparatus for printing-machines comprising a reciprocating carriage provided with an intermittently-acting front or turning roll, a curling-finger about the roll and having an extension, and a spring for holding the extension in action or to the roller.

6. A delivery apparatus for printing-machines comprising a front or turning roll and a belt or strap for alternately engaging and releasing the roll to cause the same to be intermittently driven or rotated.

7. A delivery apparatus for printing-machines comprising a front or turning roll, an actuating strap or belt and mechanism for intermittently tightening the belt to drive the roller.

8. A delivery apparatus for printing-machines comprising a front or turning roll, an actuating belt or strap and a tumbler for intermittently causing the belt to tighten or engage the roller.

9. A delivery apparatus for printing-machines comprising a front or turning roll, an actuating belt or strap for the roll, a tightening-roller for the belt and a lever and tumbler for actuating the tightening-roller.

10. A delivery apparatus for printing-machines comprising a front or turning roll, an actuating belt or strap for the roll, a tumbler having a cam portion, and a lever and belt engaging or tightening roller actuated by the cam.

11. A delivery apparatus for printing-machines comprising a front or turning roll, an actuating belt or strap for the roll, a tumbler for causing the belt to engage or drive the roller, and an actuating-pin for the tumbler.

12. A delivery apparatus for printing-machines comprising a front or turning roll, an actuating belt or strap for the roll, a spring-engaged belt-tightening tumbler and pins for tripping the tumbler.

13. A delivery apparatus for printing-machines comprising a front or turning roll, a driving belt or strap and brake for the roll and a tumbler for tightening the belt and moving the brake.

14. A delivery apparatus for printing-machines comprising a front or turning roll, a driving belt or strap and a brake for the roll, and a tumbler for putting the strap in action while taking off the brake.

15. A delivery apparatus for printing-machines comprising a front or turning roll, a driving belt or strap and a brake for the roll and a tumbler for causing the belt and brake to alternate with one another.

16. A delivery apparatus for printing-machines comprising a front or turning roll, driving mechanism for the roll, a curler for

the roll, and a dog or holder for securing the curler out of action.

17. A sheet-delivery apparatus for printing-machines comprising a reciprocating tape-carriage with tape-rollers and a front roller
5 and an adjustable gear made to be set for connecting the front roller to the tape-roller.

18. A sheet-delivery apparatus for printing-machines comprising a reciprocating tape-carriage with tape-rollers and a front roller,
10 a frame movable or adjustable about the center of the front roll and a gear carried by the frame for connecting the front roll to a tape-roller.

19. A sheet-delivery apparatus for printing-machines comprising a reciprocating tape-carriage with tape-rollers and a front roller, friction-wheels for the margin of the sheet, friction-wheels made to contact with the surface of the front roll, and a gear for connecting the front roll to a tape-roll.
15 20

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE P. FENNER.

Witnesses:

A. A. SMITH,
E. L. HUDSON.