

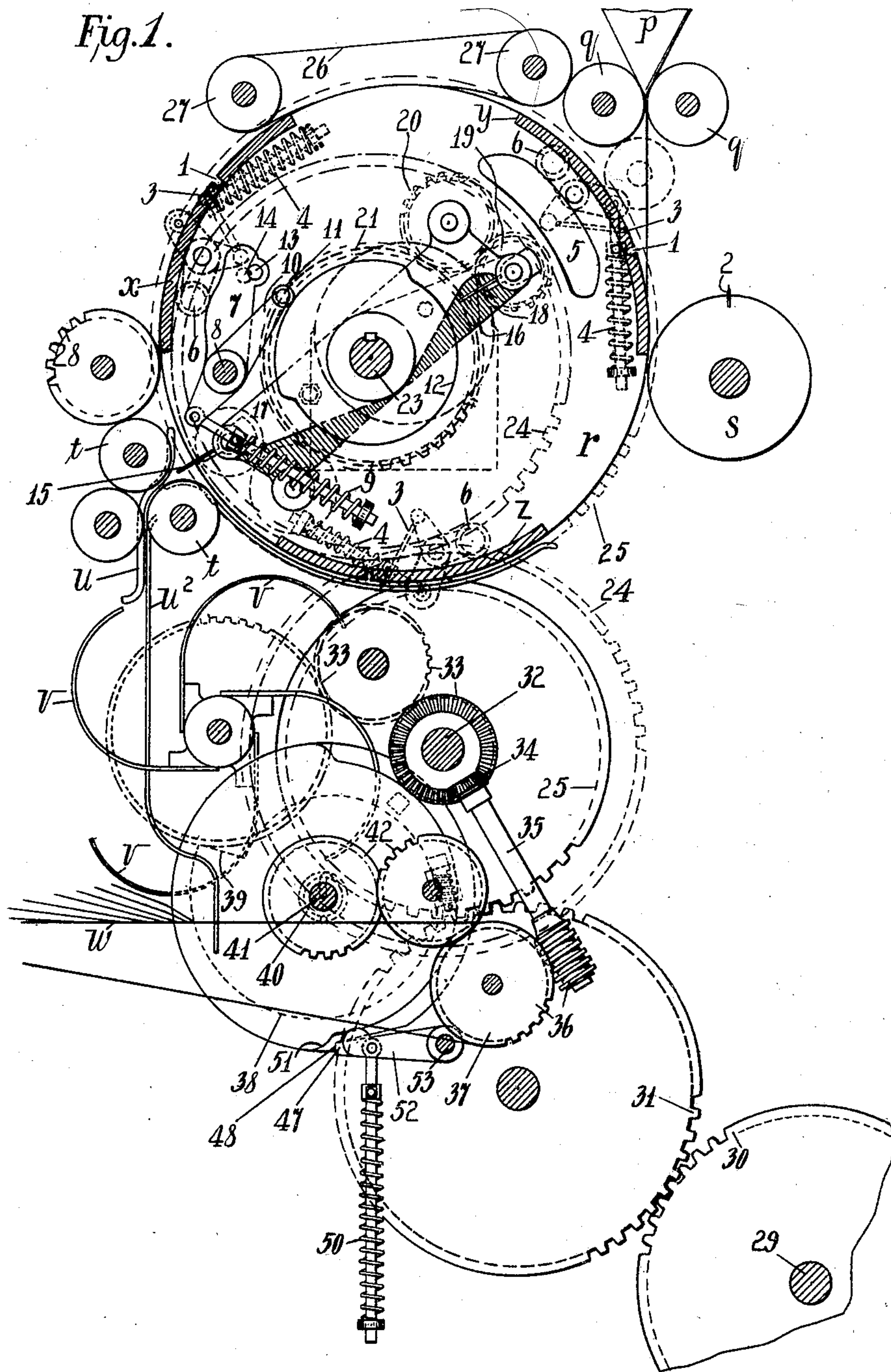
W. SCOTT.

DELIVERY MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED OCT. 22, 1900.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Edgewood Bruce
Howard T. Murray

Inventor
Walter Scott
By his Attorney
Richard W. Parkley.

No. 793,400.

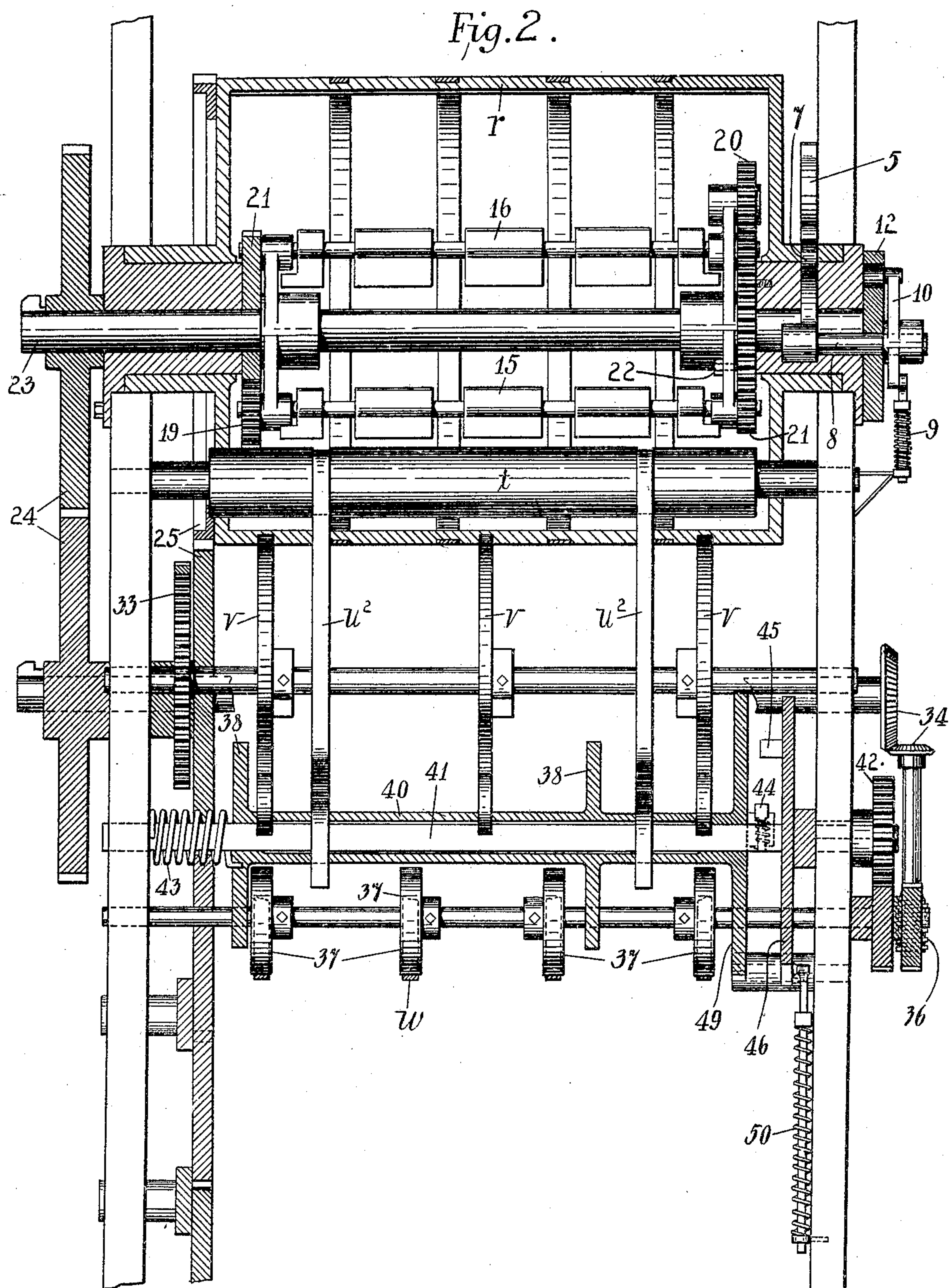
PATENTED JUNE 27, 1905.

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3 SHEETS—SHEET 2.



Witnesses
Edgeworth Bruce
Howard T. Mcmurray

Inventor
Walter Scott,
By his Attorney
Richard W. Barkley

No. 793,400.

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3 SHEETS—SHEET 3.

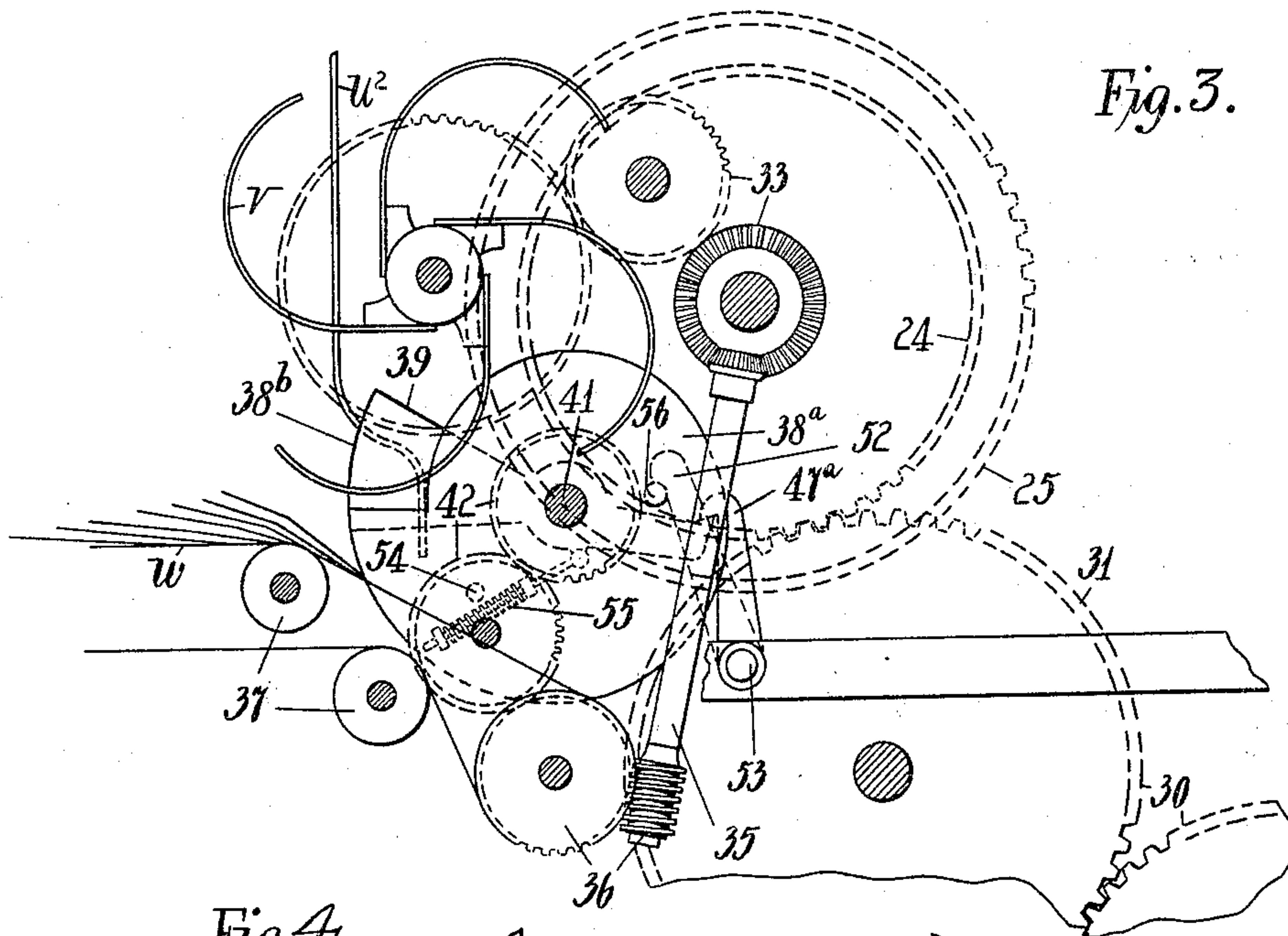


Fig. 3.

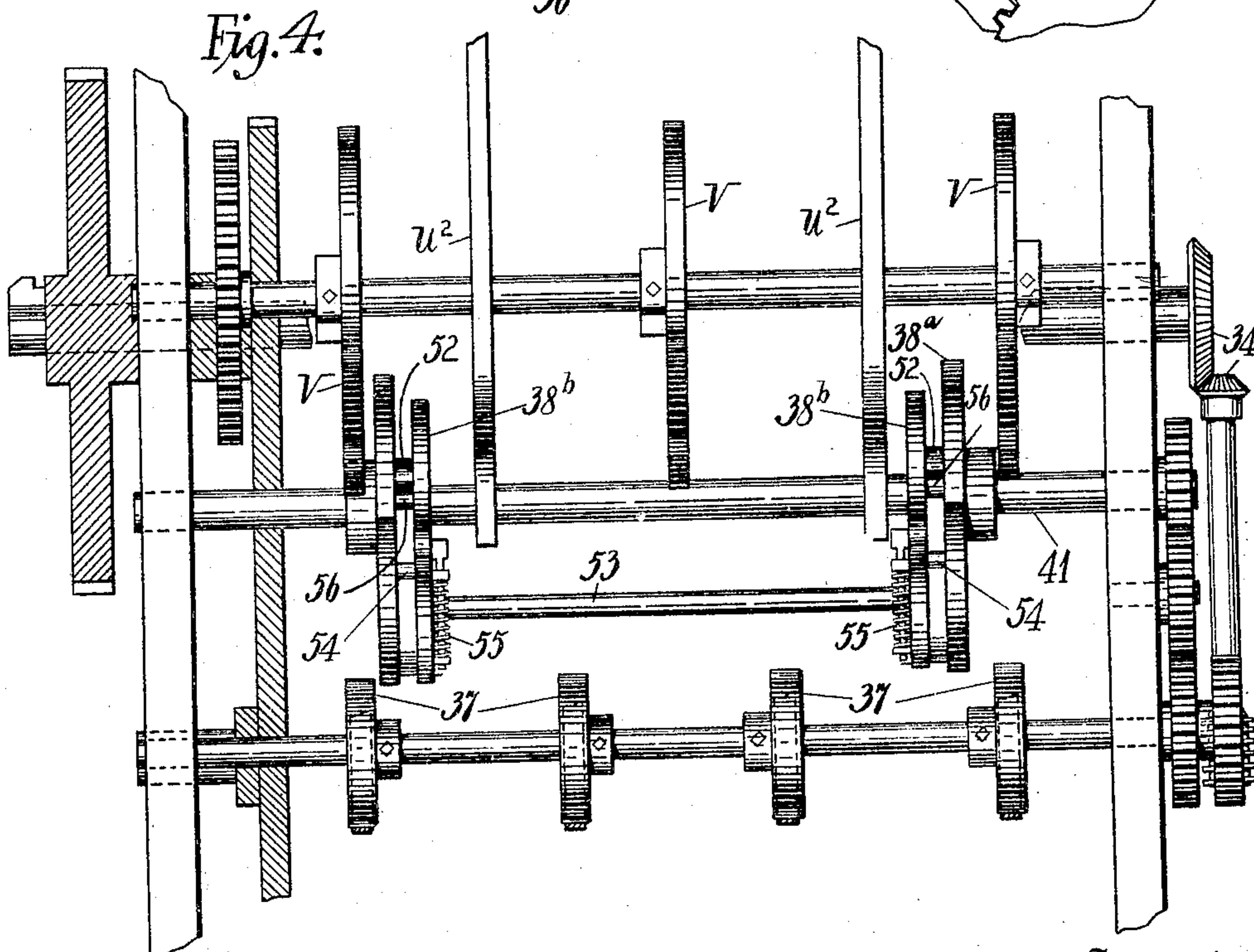


Fig. 4.

Witnesses
Edgeworths
Howard T. McMurray

Inventor
Walter Scott,
By his Attorney,
Richard W. Parkley.

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

DELIVERY MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 793,400, dated June 27, 1905.

Application filed October 22, 1900. Serial No. 33,818.

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement in Delivery Mechanism for Printing-Presses, of which the following is a specification.

One object of the present invention is to print, cut, fold, and deliver printed copies with or without collecting them, another object is to automatically count the copies as they are delivered, and other objects, as will hereinafter more fully appear.

To these ends the invention consists of features of construction, arrangements, and combinations of devices hereinafter described, and more particularly pointed out in the appended claims.

In the accompanying drawings, forming part hereof, Figure 1 is a view from the end of the folding and delivery mechanism, the frame being omitted and some parts being in section. Fig. 2 is a view, partly in section, on the vertical plane through the axis of the carrier, the view being from the left in Fig. 1, some parts being omitted and certain parts in front of said plane being shown. Figs. 3 and 4 are views of a modified form of the counting mechanism.

p indicates an internal guide or V-shaped former; q , drawing-rolls at the point thereof; r , a rotary sheet-carrier; s , a cutting-cylinder coacting with carrier r to sever sheets from the web or webs; t , folding-rolls between which the sheets are forced from carrier r ; u u^2 , guides; v , the arms of an S-fly or delivery, and w traveling tapes onto which the arms v and guide u^2 lay the folded products.

References x y z indicate sheet-receiving surfaces of the carrier r , each of said surfaces having a cutting-groove 1 therein to coact with the blade 2 of cylinder s .

3 indicates sets of impaling-pins—one set for each surface x y z —which are or may be of usual construction and operation, 4 indicating the usual spring-rods by which said pins are protruded from the carrier r . Said pins are in rear of the grooves 1 and impale the web before cutters 1 2 sever the same.

A fixed cam 5 coacts with bowls 6, connected, as usual, with pins 3 to force the pins inwardly of carrier r as the pins approach the line of tangency between the web coming from rolls q and the carrier r , said cam being shaped to release the bowls and pins as or after the points of the pins reach said line of tangency, whereby the pins are thrust through the web as this lies upon the carrier and do not, as heretofore, project out and tear elongated holes in the web or sheet. The pins 3 are drawn inwardly of carrier r when it is desired to release the sheets by means a rocking cam 7, which is fast on shaft 8, journaled in the framework. A spring-rod 9 is connected with shaft 8 in such wise that it tends to draw cam 7 inwardly of the carrier r . Shaft 8 has an arm 10 thereon, which is provided with a bowl 11, coacting with a rotatory cam 12, whose axis of motion is eccentric to carrier r . The cam 7 is provided with a hole 13, which in the extreme outer position of cam 7 registers with a hole 14, threaded, if desired, in the fixed frame of the machine. By inserting a suitable pin through the holes 13 14 when they register with each other the cam 7 may be locked in its pin-operating or working position.

Two folding-blades 15 16 are revolubly connected with the revolving frame 17 18, whose axis of motion coincides with that of cam 12 and which axis is therefore eccentric to the carrier r .

19 indicates gears fast on the shafts of the blades 15 16 and mesh with gears 20, journaled on the frame 17 18. The gears 20 mesh with gears 21, which may be fixed against motion by putting pins 22 through holes therein and into holes in the frame of the machine or which may be made to revolve with the frame 17 18 by inserting said pins 22 through the gears and into holes in said frame 17 18. The shaft 23, to which frame 17 18 is fast, is driven by a train of gearing 24, while the carrier r is driven at a different rate of speed by a train of gearing 25. As shown, the trains 24 25 drive the frame 17 18 to make three turns while carrier r makes two turns, being in this respect the same substantially as in my Letters Patent No. 572,280,

dated December 1, 1896, to which reference is made for a fuller description of the construction of carrier *r* and its supports.

26 is a set of tapes running on pulleys 27 and coacting with the upper part of carrier *r* to retain the sheets against the carrier and feed them when pins 3 are drawn in by cam 5.

28 indicates the pitch-circle of a gear connecting the carrier *r* with one of the rolls *t* to drive said rolls, which are geared together. Rolls *t* may be driven at greater surface speed than carrier *r*. In the instance shown power is derived from a shaft 29, having a gear 30 fast thereon, and 31 is an intermediate gear connecting gear 30 with one of the train 25 on a journaled shaft 32. The **S**-fly *v* is driven from shaft 32 by a train of gearing 33, and tapes *w* are driven from said shaft 32 by speed-reducing mechanism, as bevel-gears 34, shaft 35, and worm-gearing 36, which mechanism drives the pulleys 37.

The counting mechanism (shown in Figs. 1 and 2) comprises slowly-rotating spirals or cams 38, having radial faces 39 in the same plane longitudinally of the hollow shaft 40, to which the cams 38 are fast. Shaft 40 has bearings on a rotatory shaft 41, which is journaled in the framework of the machine and which is driven from the shaft of pulleys 37 by a train of gearing 42. The shaft 40 is connected with the shaft 41 by a coiled spring 43, which has its ends fast to said shafts and which is tensioned to throw shaft 40 and cams forwardly (to the left in Fig. 1) until spring-stop 44 on the side of a cam 38 strikes against an arm or pin 45 on a disk 46, fast to shaft 41. The cams 38 are located with reference to the lower ends of guides *u*², so that of each cam that part having the shortest radius will be about flush with said guides in certain positions of the cams and so that of each cam that part having the greatest radius will extend beyond the lower part of said guides at certain times. Inasmuch as in this form of delivery the copies follow the guides *u*², it follows that cams 38 during their rotation gradually arrest the copies farther and farther from the lower or stopping parts of the guides *u*², said copies being on the tapes *w* until the face or shoulder 39 again permits the sheets to follow the guides *u*² until they strike against the cams 38 at their shortest radii, which thus exposes more of one sheet or copy than of another, thus indicating to the eye a certain number of copies. In order to secure this greater or more accurate exposure of one copy, I arrange to arrest the motion of rotation of cams 38 while faces 39 are still above the lower slanting parts of the guides *u*², thus winding spring 43 and separating stops 44 45 and then releasing the cams suddenly, whereupon the spring 43 throws the cams forward until they are arrested by the action of stops 44 45. At this time spring-stop 44 acts as a cushion or dash-pot. In the form of the inven-

tion shown in Figs. 3 and 4 the cams 38 are arrested by means of a detent 47, which engages with a tooth or shoulder 48 on a disk 49, which is fast to shaft 40. A spring-rod 50 presses detent 47 against the periphery of the disk 49 and into engagement with said tooth. The detent 47 is disengaged from said tooth at the proper time to release the cams 38 and disk 49 by means of a cam 51, fast on shaft 41, and an arm 52, rigidly connected to the shaft 53, on which the detent is also fast. Whenever detent 47 releases the disk 49 and cams 38, as above stated, the spring 43 throws the cams forward quickly and until the stops 44 45 arrest them.

The operation of the above-described folding, cutting, and delivery apparatus is as follows: In the drawings one of the gears 21 is shown as pinned to the frame 18 and as unpinned from the main frame of the machine, while the other gear 21 is pinned to the main frame of the machine and is unpinned from the revolving frame 17, and the cam 7 is free to be moved to and fro by cam 12 and the spring 9. Consequently, as in my said patent fully set forth, blade 16 is inactive or inoperative and blade 15 is operative, and the operation of blade 15 is substantially the same as described in my said Patent No. 572,280, which description need not be repeated here. Each set of pins 3 is drawn inwardly of carrier *r* as it approaches the position where the ends of the web are impaled and is thrust outwardly as or after it passes the line of tangency of the web and carrier *r*, whereby the web is impaled just before it is severed and released by the cutting apparatus. The web ends are carried around by the pins, and the sheets are cut off by the grooves 1 and blade 2. The blade 15 is shown as folding off a sheet from the surface *x*, while the surface *y* is about to have the web laid thereon prior to the cutting off of a sheet, whence it follows that surface *z* will pass rolls *t*, while blade 15 is about one hundred and eighty degrees away therefrom, and that blade 15 will overtake surface *y* and fold off the sheet thereon as that surface passes rolls *t*. Then surface *x* will receive a sheet, pass rolls *t* while blade 15 is at the other side of the carrier *r*, receive a second sheet, and its pins 3 will be withdrawn by cam 7 as it again passes rolls *t*, at which time blade 15 will force the sheets on said surface *x* between rolls *t*. The cam 7 is moved to its working position as the next sheet-receiving surface passes rolls *t*, and so on indefinitely, the sheets being collected by twos and folded off from surfaces *x y z*, in the order named, while these surfaces pass rolls *t* in the order *x z y*. The sheets folded off between the rolls *t* are guided down onto the **S**-flies *v* by the fixed guides *u u*² in a known manner and against the slowly-moving edges of the spirals or cams 38 and are laid upon the tapes *w* at greater

and greater distances from the point where the guides w^2 pass between the tapes w . At regular intervals or numbers of copies on tapes w the cams 38 are arrested by detent 47 with their faces 39 above the horizontally-extending parts of the guides w^2 and are subsequently released, as above described, whereupon spring 43 rotates them suddenly and until stops 44 45 arrest them with their faces 39 in or below the plane of the upper parts of tapes w . When single cuts are to be folded, both gears 21 and cam 7 are pinned to the fixed framework, whereupon each blade 15 16 will operate to fold off each time it passes the rolls t , and each set of pins 3 will be withdrawn by cam 7 to release the heads of the sheets as blades 15 16 fold them off between the rolls t , whence the copies are delivered as above described, the only difference being that each arm of the S-flies this time receives a sheet, whereas when collecting as above set forth it is only every other one of the arms that receives sheets and drops them onto the tapes w . Obviously there may be more than one web employed without affecting the operation of the mechanism hereinbefore described.

In Figs. 3 and 4 is illustrated a modification of the counting mechanism in which the sheet-stopping cams are made in two parts, one of which only is arrested and suddenly released in the manner above specified. In this modification the cams comprise each two parts 38^a 38^b, of which parts 38^a are fast on the shaft 41, and parts 38^b are loose thereon and are held against stops 54 by spring-rods 55, connected with the parts 38^a 38^b. The parts 38^b are arrested at the proper times by hooks 47^a, which engage with extensions of the parts 38^b and which are cammed off or disengaged therefrom by pin 56 on a part 38^a, which engages with lever 52 on a long shaft 53. The peripheries of the parts 38^b are the same as the peripheries of parts 38^a where the two parts overlap at the place where the radii are greatest. The action of the modification is similar to that of the counting mechanism, (shown in Figs. 1 and 2,) for in both cases the sheets are bunched on the tapes during the arrest, being spread only by the motion of the tapes w , and on the release of the sheet-arresters and their throwing forward against the stops provided for arresting them the next sheet moves farther along the guides w^2 until arrested by the cams where their radii are shortest.

The carrier r is made slightly greater in circumference than the lengths of the sheets to be carried thereon for the purpose of having the sheets to pull up taut on the pins 3, thus preventing their tails from being back over the following groove 1 when collecting sheets and the cutting thereof at the said following grooves. The increased length may be one-sixteenth of an inch, more or less.

The carrier or collecting-cylinder r may be composed of an odd or an even number of sections, according to the number of sheets to be collected. The pin-operating and other mechanism are proportioned accordingly, of course. When folding the sheets off, the folding-blades will be timed so as to suit the number of sheets being collected. The cutting-knives may be carried upon the carrier r , and one or more grooves 1 may be upon the cylinder s .

Instead of having the cylinder r do the collecting the cylinder s may be used for that purpose, being provided in such event with suitable sheet-retainers, and the cylinder s may in such case return the sheets to the cylinder r or may deliver them otherwise. Mechanisms for returning sheets in such case and for delivering them otherwise are shown, respectively, in Letters Patent to Spalckhaver, dated July 3, 1900, and numbered 652,817, and to Crowell, dated January 21, 1890, and numbered 419,834.

No claim is made herein to any combination drawn upon the carrier r and cylinder s and parts connected to or operating therewith to collect and fold off sheets or cuts or upon the circumference ratio of the said carrier and cylinder, as all such matters are claimed in a divisional application filed March 26, 1901, Serial No. 52,877.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of guides w^2 , an S-fly co-acting therewith to lay sheets upon traveling tapes, sheet-arresting rotatory cams having each a substantially radial face, said faces being in the same plane, a progressively-rotating stop member loosely connected with said cams and against which said cams are spring-held, means whereby said cams are arrested with their said radial faces in or above the horizontally-extending parts of the guides w^2 , and means for releasing said cams from the control of said arresting means and permitting said spring to throw said cams forward until said stop member arrests them, whereby said faces are moved below said horizontal plane and the copies may follow the guides w^2 farther and so expose more of one copy than of another, substantially as described.

2. The combination of means for delivering sheets upon a carrier, with disk cams having radial faces and rotating on an axis parallel to the plane of the carrier and said cams extending below said carrier, substantially as described.

3. The combination with means for delivering sheets upon a receiver which moves the sheets forward, of a spiral cam constructed so as to arrest the sheets in a gradually-advancing position and then allow them to fall back quickly, thereby making a space or count as the sheets are delivered, substantially as described.

4. The combination with means for delivering sheets upon a receiver which moves the sheets forward, of a rotating spiral cam having a spring-propelled action at the time it
5 acts to count the sheets, and means for arresting said cam temporarily, substantially as described.
5. The combination of means for delivering sheets upon a receiver, which moves the sheets
10 forward, of a rotating spiral cam having a progressive slow motion while the sheets are being arrested by it and a quick motion to insure a correct separation and count the sheets, substantially as described.
- 15 6. The combination of means for delivering sheets upon a carrier which moves the sheets forward, of a rotating spiral cam or cams mounted on a hollow shaft, a shaft inside said hollow shaft and attached thereto by a spring-actuated means so as to cause the cams to
20 move quickly while counting or acting to make a separation of the sheets, substantially as described.

Signed at New York, in the county of New York and State of New York, this 19th day of
October, A. D. 1900. 25

WALTER SCOTT.

Witnesses:

RICHARD W. BARKLEY,
GUS. C. HENNING.