

A. PENTECOST.
RIBBON MECHANISM FOR CALCULATING MACHINES.
APPLICATION FILED AUG. 5, 1905.

912,162.

Patented Feb. 9, 1909.
3 SHEETS—SHEET 1.

Fig. 1.

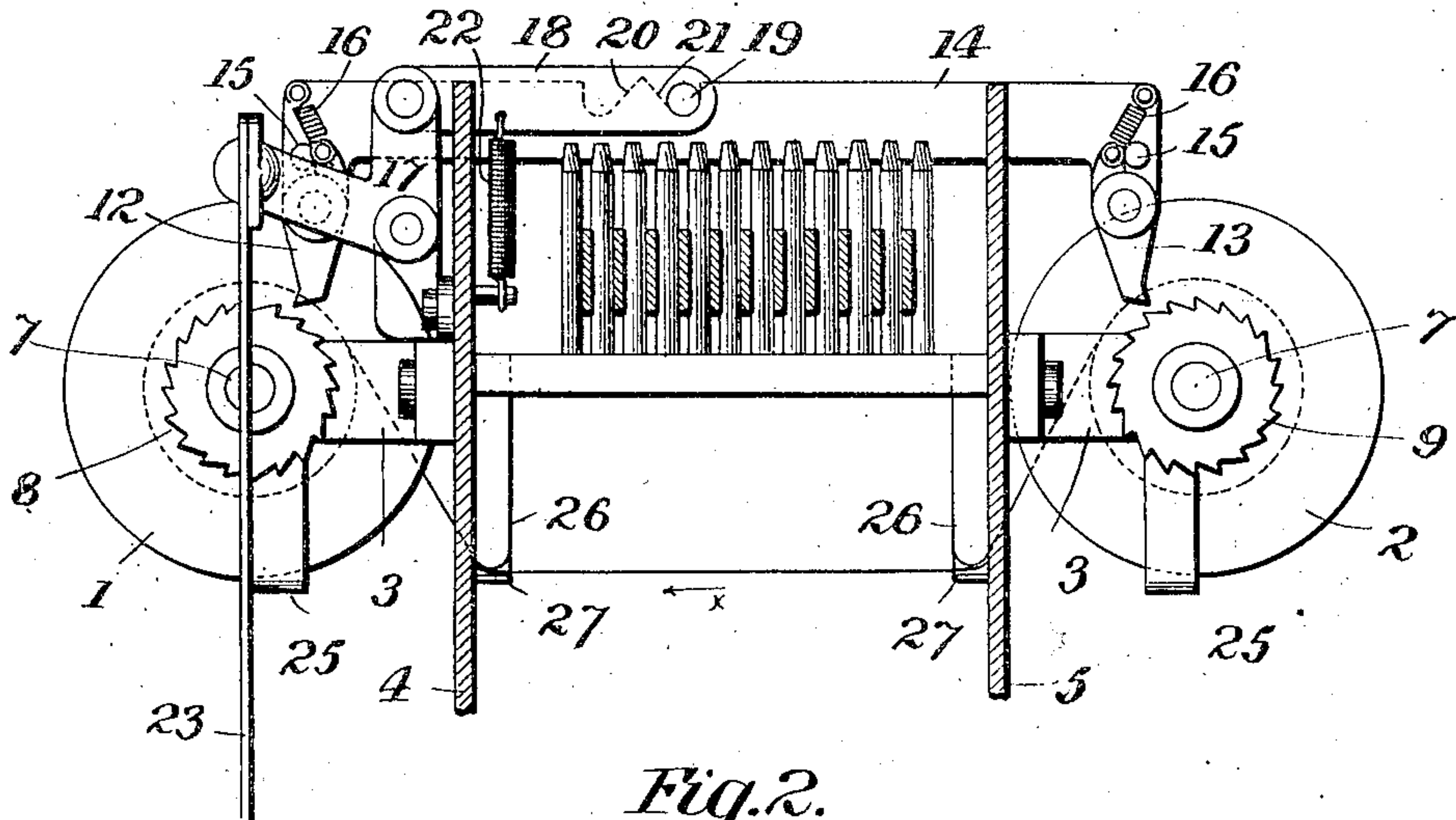
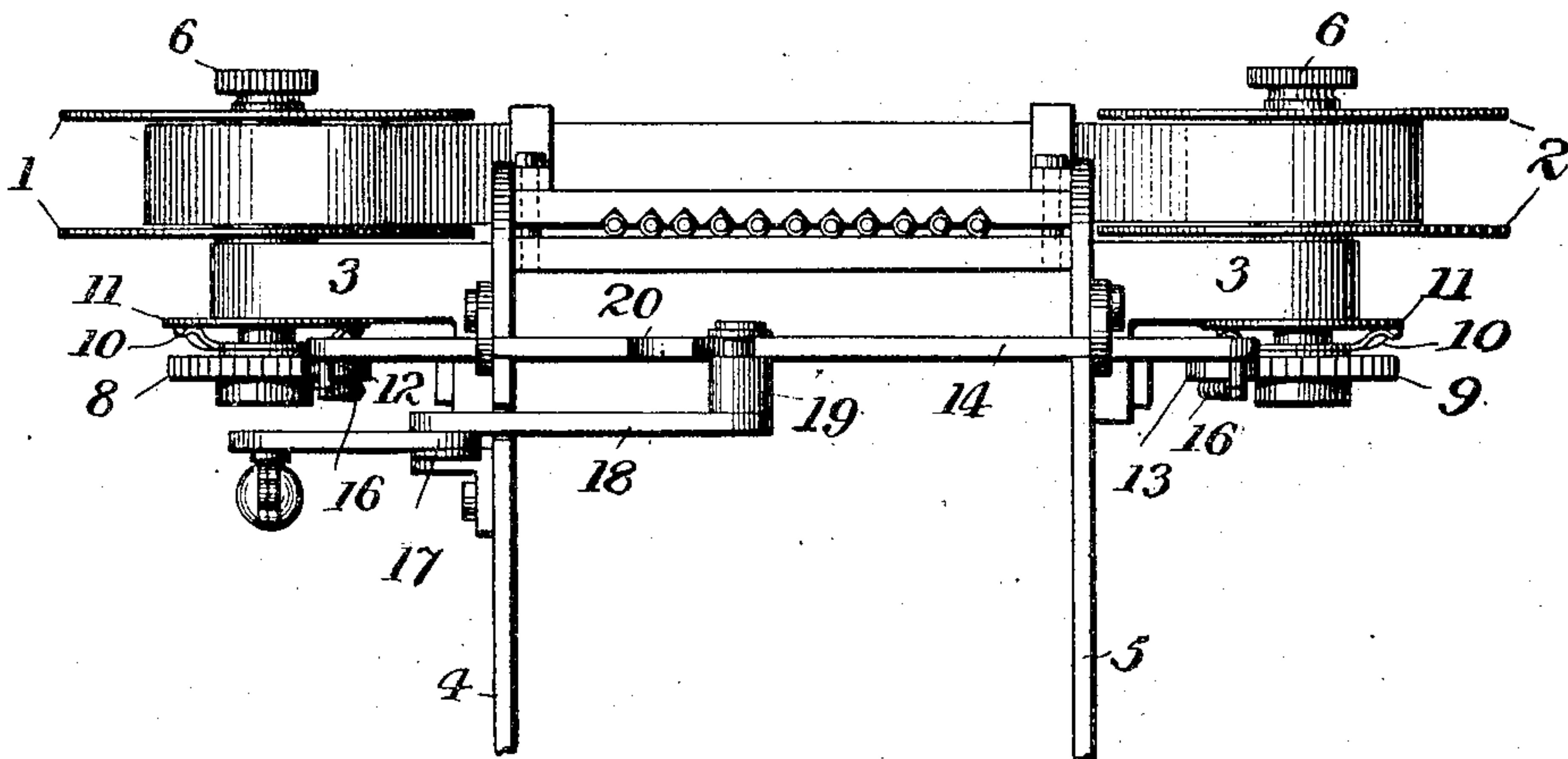


Fig. 2.



Witnesses
J. G. Stinzel
B. C. Rust

Inventor
Arthur Pentecost
by *Foster Stearns & Watson*
Attorneys

A. PENTECOST.
 RIBBON MECHANISM FOR CALCULATING MACHINES.
 APPLICATION FILED AUG. 5, 1905.

912,162.

Patented Feb. 9, 1909.
 3 SHEETS—SHEET 2.

Fig. 3.

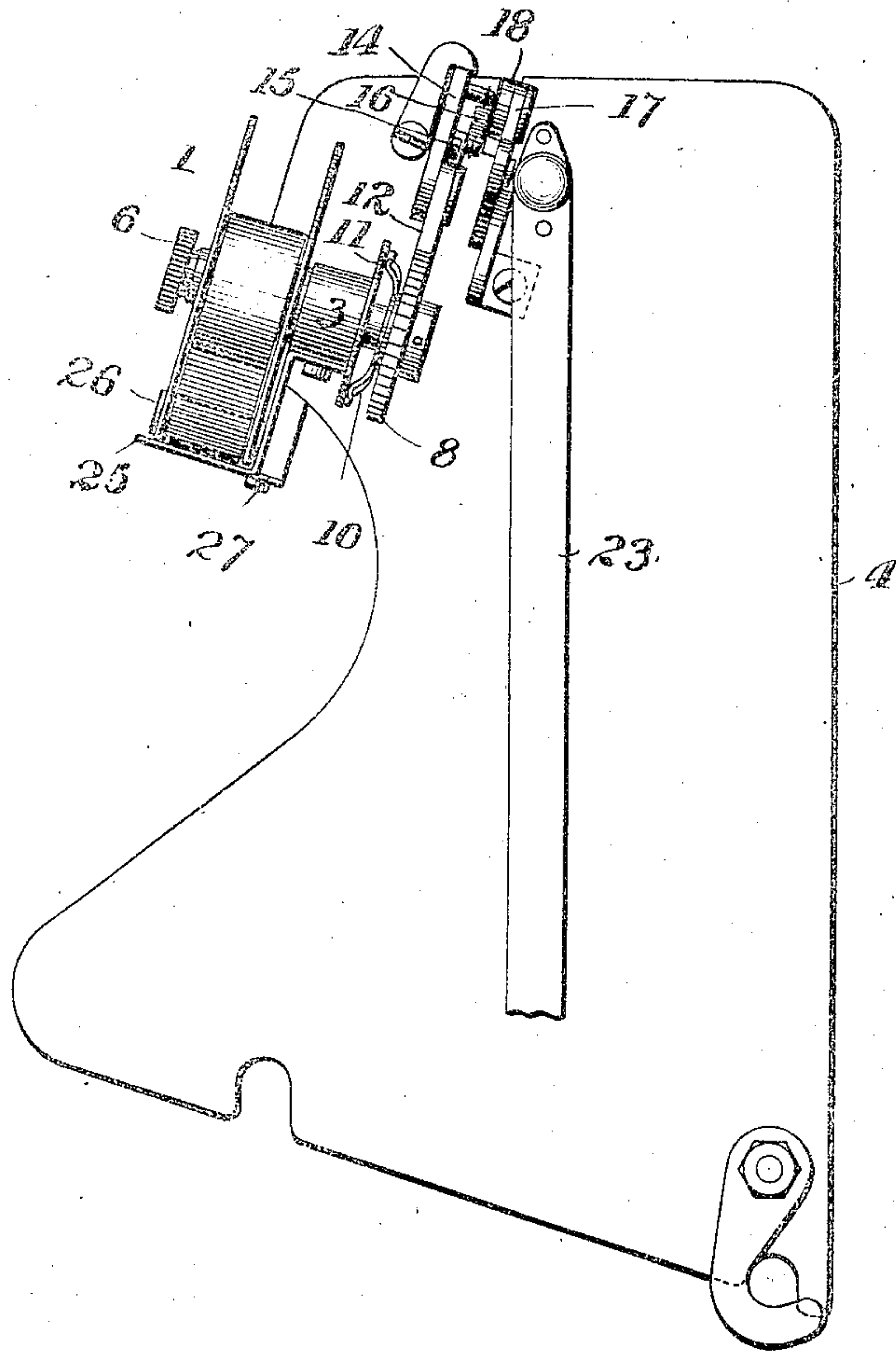
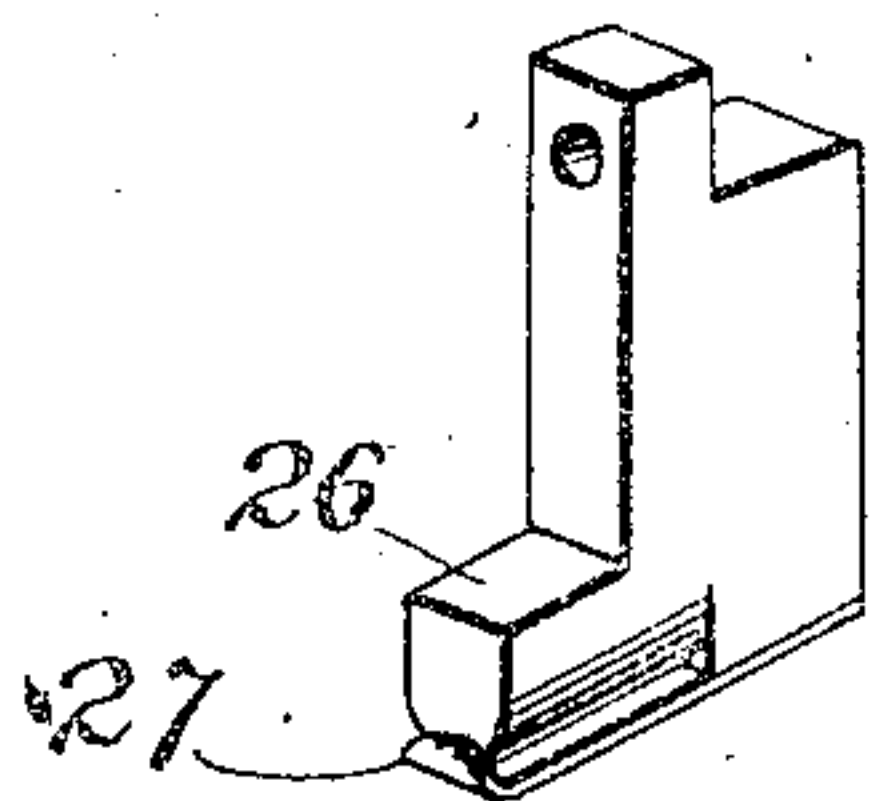


Fig. 4.



Witnesses
J. G. Stinkell
 B. C. Rust.

Inventor
Arthur Pentecost
 by *Walter Stewart Watson*
 Attorneys

A. PENTECOST.
 RIBBON MECHANISM FOR CALCULATING MACHINES.
 APPLICATION FILED AUG. 5, 1905.

912,162.

Patented Feb. 9, 1909.
 3 SHEETS—SHEET 3.

Fig. 5.

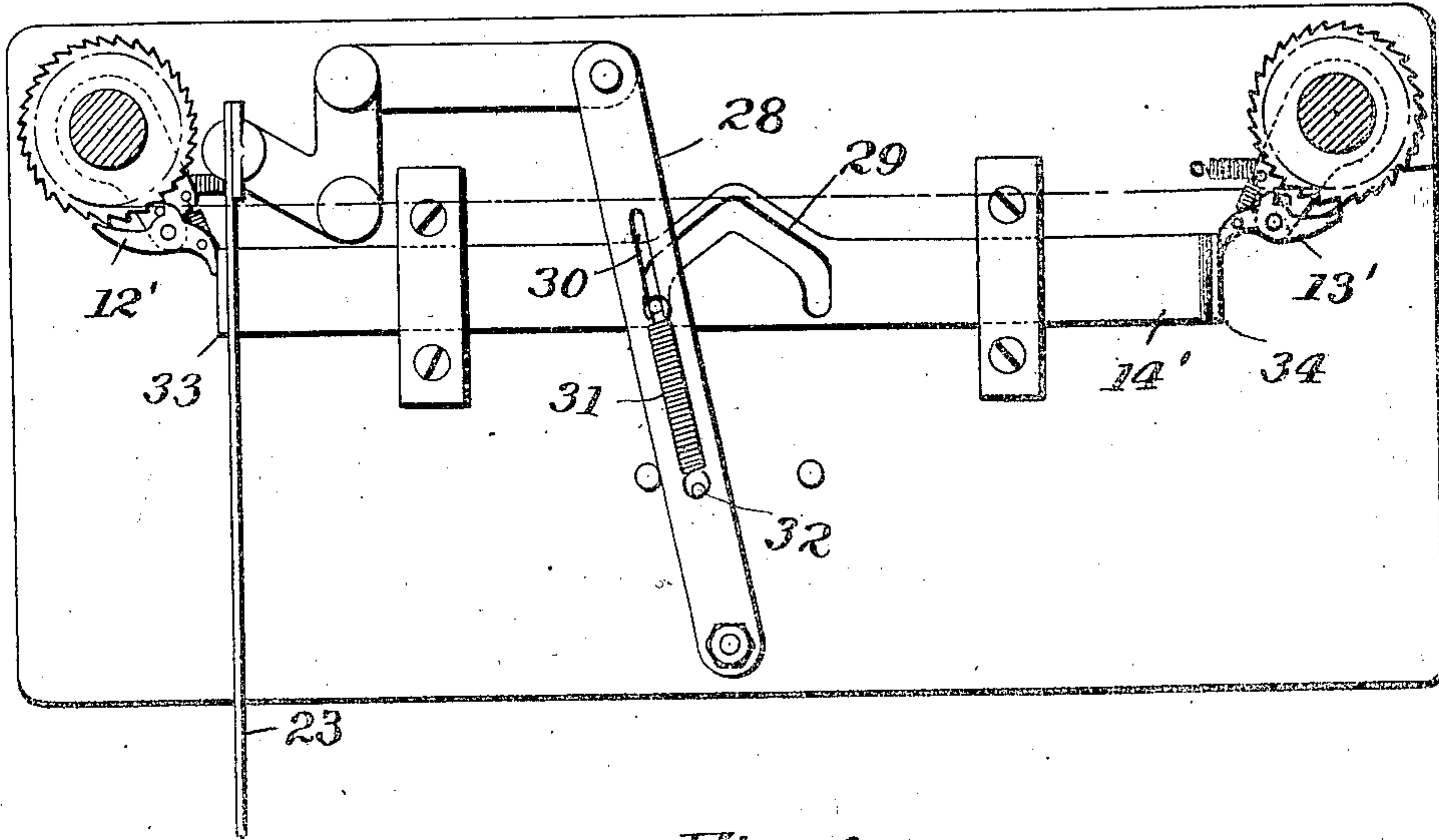
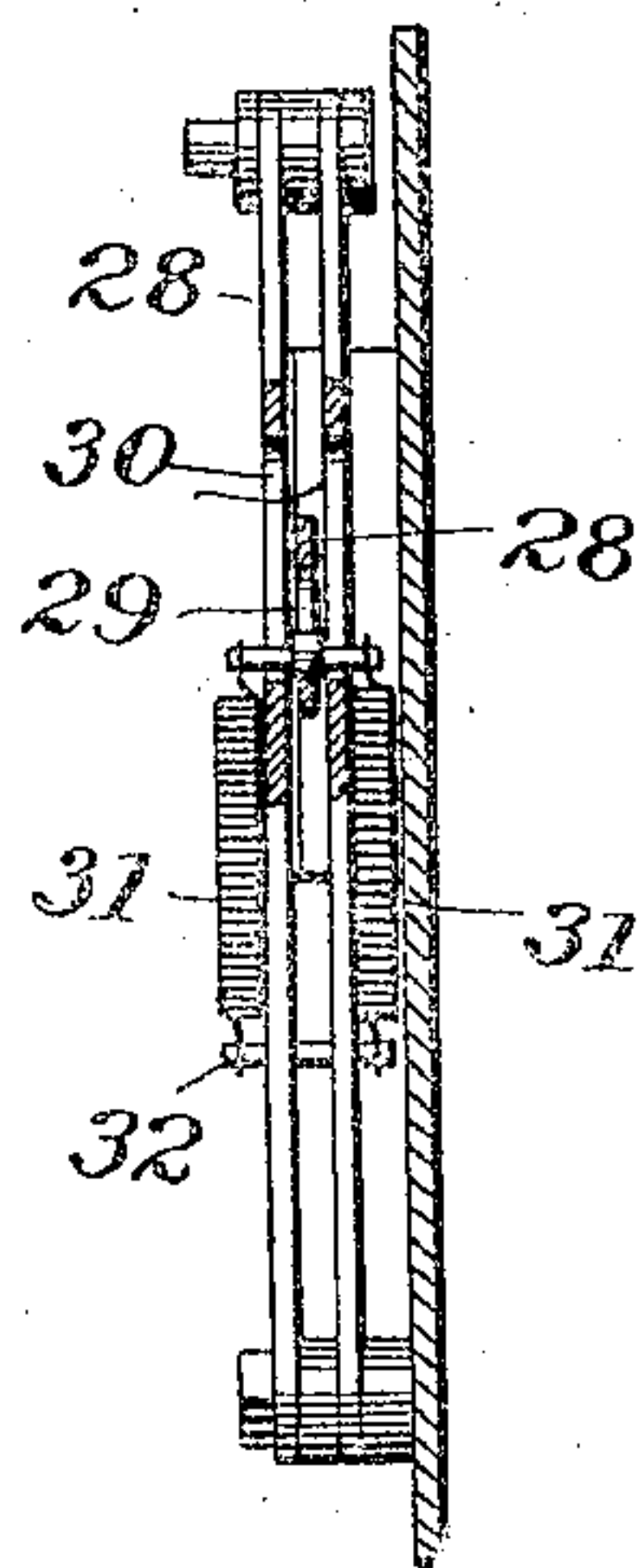


Fig. 6.



Witnesses
J. C. Linkel
 B. C. Rust.

Inventor
Arthur Pentecost
 by *Foster Freeman*
 Attorneys

UNITED STATES PATENT OFFICE

ARTHUR PENTECOST, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO PIKE ADDING MACHINE COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

RIBBON MECHANISM FOR CALCULATING-MACHINES.

No. 912,162.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed August 5, 1905. Serial No. 272,913.

To all whom it may concern:

Be it known that I, ARTHUR PENTECOST, a subject of the King of Great Britain, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Ribbon Mechanism for Calculating-Machines, of which the following is a specification.

The present invention relates to improvements in ribbon mechanism for type printing machines and is particularly designed for use with the recording devices of adding machines.

The object of the invention is to provide a simple and durable means for supporting and feeding an inked ribbon across the path of the printing type and in a substantially straight line from one supporting spool to the other. Also to provide means for automatically reversing the direction of movement of the ribbon when it has been entirely unwound from either of its supporting spools.

As the invention is particularly adapted for use in connection with adding machines it is shown in the accompanying drawing as applied to the recording mechanism of an adding machine invented by W. H. Pike, Jr., which is illustrated in detail in Letters Patent No. 791,941 granted June 6, 1905.

Referring to the drawings:—Figure 1 is an elevation of the upper portion of such a recording mechanism having the present invention applied thereto; Fig. 2 is a plan view; Fig. 3 is a side elevation; Fig. 4 is a detail view; Fig. 5 is an elevation of a different embodiment of the invention from that illustrated in Figs. 1 to 4; Fig. 6 is a view on the line 6—6 of Fig. 5.

The ribbon spools 1, 2, are carried by short shafts mounted in brackets 3 secured to and projecting laterally from the side plates 4, 5, between which the several parts of the recording mechanism are arranged. Each spool is detachably secured to its supporting shaft by a suitable nut 6, whereby the spools may be readily exchanged or reversed if desired, the shaft and spool being provided with interlocking means causing them to rotate together.

The shafts 7 extend through the bearings provided therefor in the brackets 3 and on

the opposite ends thereof from the spools are mounted ratchets 8, 9, the teeth of which extend in opposite directions. Spring washers 10 with yielding fingers are interposed between the ratchets and disks 11 loosely supported on the shafts and bearing against the adjacent faces or sides of the brackets 3.

The ratchets 8, 9 are adapted to be respectively engaged by pawls 12, 13, mounted at opposite ends of and depending from a bar 14 that extends through suitable guide ways formed in the side plates 4, 5. Each pawl is pivotally mounted on said bar and has the section thereof above its pivot normally drawn against a pin 15 by a spring 16.

On a suitable bearing on the side plate 4 is pivoted a bell crank lever 17 to the upper arm of which is pivotally connected one end of a link 18 having at its other end a laterally projecting stud 19 adapted to enter either of two notches 20, 21 formed in the upper edge of the pawl carrying bar 14. The stud 19 is preferably provided near its free end with an annular groove into which the bar 14 projects and the link 18 extends through a guide slot in the side plate 4. The section of the bar 14 between the notches 20, 21 is provided with inclined sides and a coiled spring 22 acts to draw the stud 19 into engagement with the bar. To the other arm of the bell crank 17 is connected, one end of a rod or link 23 by means of which said bell crank is rocked to reciprocate the bar 14. In the embodiment of the invention illustrated a universal joint is interposed between said rod 23 and the bell crank 17. The ribbon 24 has its ends secured to the spools 1, 2 and extends across the space between them being guided by suitable projections on the frame of the recording mechanism. Each spool is preferably provided with a guard finger 25, and the ribbon passes between projections 26 on the frame of the recording mechanism and spring fingers 27 secured to said projections.

The operation of the parts above described is as follows: The rod or link 23 is reciprocated periodically during the operation of the machine. Assuming that the parts are in the position shown in full lines in the drawing, it will be seen that as the rod or link 23 moves downwardly the bell crank

17 will move the pawl carrying bar 14 so that the pawl 12 thereon will engage the ratchet 8 and rotate the spool 1 connected therewith thus moving the ribbon a short distance in the direction of the arrow α . On the upward stroke of the rod 23 the parts will be returned to normal position, the pawl 12 rocking slightly about its axis as it passes over the upper edge of the tooth or teeth of the ratchet in rear of that previously engaged by it. As soon as the pawl passes such tooth or teeth it is returned to its normal position by the spring 16. It will be noticed that the bar 14 is of such length that only one of the ratchets will be engaged thereby at a single reciprocation of said bar; and therefore when the parts occupy the relative positions indicated in full lines in Fig. 1 the pawl 13 will not engage its ratchet 9 during the reciprocation of the pawl carrier bar 14. When the movements above described have been repeated sufficiently long to entirely unwind the ribbon from the spool 2 the ratchet 8 is held from turning at the next downward stroke of the link 23 and the pull exerted on the link 18 by the bell crank 17 causes the stud 19 to ride up the incline separating the notches 21, 20 in the bar 14, and pass over said notch 20 into which it is drawn by the spring 22. The return of the link 18 to the position indicated in full lines in Fig. 1, as the rod 23 rises, acts to shift the pawl carrier 14 relative to the bell crank 17, so that the pawl 12 is relatively closer to said bell crank than when the link 18 was engaged with the notch 21 in the bar 14. At each reciprocation of the rod 23, after such variation or change in the relation of the pawl carrying bar 14 and the bell crank 17 the pawl 13 will actuate the ratchet 9 and rotate the spool 2 to move the ribbon in a reverse direction from that in which it was moved by the action of the pawl 12 on the ratchet 8. When the ribbon has been entirely unwound from the spool 1 the relation of the bar 14 to the bell crank 17 will be again varied so that the link 18 will engage the notch 21 and the direction of movement of the ribbon will thus be automatically reversed.

In Figs. 5 and 6, which illustrate an embodiment of the invention differing in detail somewhat from that above described, the pawls 12', 13' for actuating the ratchets of the ribbon spools are not mounted on the reciprocating bar 14' but independently on the frame of the machine. The bar 14' is reciprocated by an arm 28 pivotally supported at its lower end and provided with a slot through which the said bar passes. A cam slot 29 is formed in the bar 14' and in said slot works a roller carried by a short pin, the ends of which project through slots 30 in the arm 28. Said roller pin is con-

nected with coiled springs 31, the lower ends of which engage studs 32 on the arm 28 whereby the roller is held in contact with the lower side of slot 29. At its ends the bar 14' is provided with laterally projecting ears or projections 33, 34 adapted to actuate, respectively, the pawls 12', 13'.

The operation of the embodiment of the invention illustrated in Figs. 5 and 6 is similar to that before described. When the parts are in the position shown in Fig. 5, (the rod 23 being shown depressed and the bar 14' being at the limit of its movement toward the left) the pawl 13' will be actuated at each reciprocation of the bar 14'. When, however, the ribbon is entirely wound off from the spool actuated by the pawl 12' the resistance offered at the next reciprocation of the bar 14' will shift the arm 28 from the position shown in Fig. 5 into engagement with the opposite end of the slot 29 and the subsequent reciprocations of the bar 14' will actuate the pawl 12' and move the ribbon in a direction opposite that in which it was moved when the pawl 13' was actuated. The actuating bar in either of the forms shown may be operated from any moving part of the machine, that is, for instance, it may be connected to be reciprocated from an arm on the shaft 922 of the machine of the Pike patent 791,941.

It will be seen that by the present invention there is provided a ribbon mechanism which is particularly adapted for use with adding machines and by which the ribbon moves in a straight line from one spool to another, said spools being arranged relatively close together and being supported in such a manner as to be readily accessible.

Claims:

1. In a ribbon feeding mechanism, the combination of two spools, means for rotating each spool, a bar adapted to be reciprocated to impart a step by step movement to both said spool rotating means, and means for reciprocating said bar adapted to be connected therewith at either of two points and to impart a uniform reciprocatory movement to the bar at each actuation thereof.

2. In a ribbon feeding mechanism, the combination of two spools, a feed wheel for each spool, a reciprocating bar, means actuated by the reciprocation of said bar for operating the feed wheel of either spool step by step, and means for varying the connection between said bar and its actuating devices to cause it to directly operate the spools alternately.

3. In a ribbon feeding mechanism, the combination of two spools, means for rotating said spools including a longitudinally movable bar adapted to positively move one of said spools at each reciprocation, and means for reciprocating said bar a uniform distance at each actuation thereof to rotate

said spools and adapted to be connected with the bar at either of two points between the spools, for the purpose described.

4. In a ribbon feeding mechanism, the combination of two spools, a ribbon connected to both spools, means for rotating said spools including a longitudinally movable bar, means for reciprocating said bar a uniform distance at each actuation thereof to rotate said spools, and means for automatically varying the point of connection of said reciprocating means with the bar when the ribbon is unwound from either spool, for the purpose described.

5. In a ribbon feeding mechanism, the combination of two spools, a ribbon connected to said spools, means for rotating said spools including a bar adapted to reciprocate transversely of the axes and to actuate said spools by said reciprocation, and means for reciprocating said bar adapted to be connected therewith at either of two points and to impart a uniform movement to the bar at each actuation thereof.

6. In a ribbon feeding mechanism, the combination of two spools, a ribbon connected to said spools, means for rotating said spools including a bar adapted to reciprocate transversely of the axes and to actuate said spools by said reciprocation, means for reciprocating said bar adapted to be connected therewith at either of two points and to impart a uniform movement to the bar at each actuation thereof, and means for automatically shifting the point of connection of said reciprocating means and bar when the ribbon is unwound from either spool.

7. In a ribbon feeding mechanism, the combination of two spools, a ribbon connected to both spools, a ratchet connected with each spool, a feed pawl for each ratchet, a reciprocatory bar adapted to actuate both pawls by its reciprocation, and means for reciprocating said bar adapted to be con-

nected therewith at either of two points and to impart a uniform movement to the bar at each actuation thereof.

8. In a ribbon feeding mechanism, the combination of two spools, a ratchet for each spool, a reciprocating pawl carrier provided with two pawls each adapted to actuate one of the spool ratchets, a lever movable through a fixed distance at each actuation thereof, and means connecting said lever and pawl carrier for reciprocating the latter at each operation of the lever, said carrier being adapted to be periodically shifted relative to its connection with said lever, for the purpose described.

9. In a ribbon feeding mechanism, the combination of two spools, a feed wheel for each spool, a pawl for actuating each spool feed wheel, a reciprocating bar actuating both pawls, and means for reciprocating said bar including a link provided with a pin adapted to be engaged in either of two seats formed in the bar, for the purpose described.

10. In a ribbon feeding mechanism, the combination of two spools, a feed wheel for each spool, a bar adapted to be reciprocated across the space between said spools, and having mounted thereon two pawls each adapted to operate one of the feed wheels, a lever movable through a fixed distance at each actuation, and a link having one end connected with said lever and its other end adapted to engage the pawl carrying bar at either of two points, the parts being so arranged that the connection between said link and bar will be shifted when either spool is held from movement.

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

ARTHUR PENTECOST.

Witnesses:

W. J. WARD,

E. A. BATAILLE.