

Sept. 30, 1941.

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2,257,553

RIBBON REVERSE MECHANISM

Filed Feb. 6, 1941

2 Sheets-Sheet 1

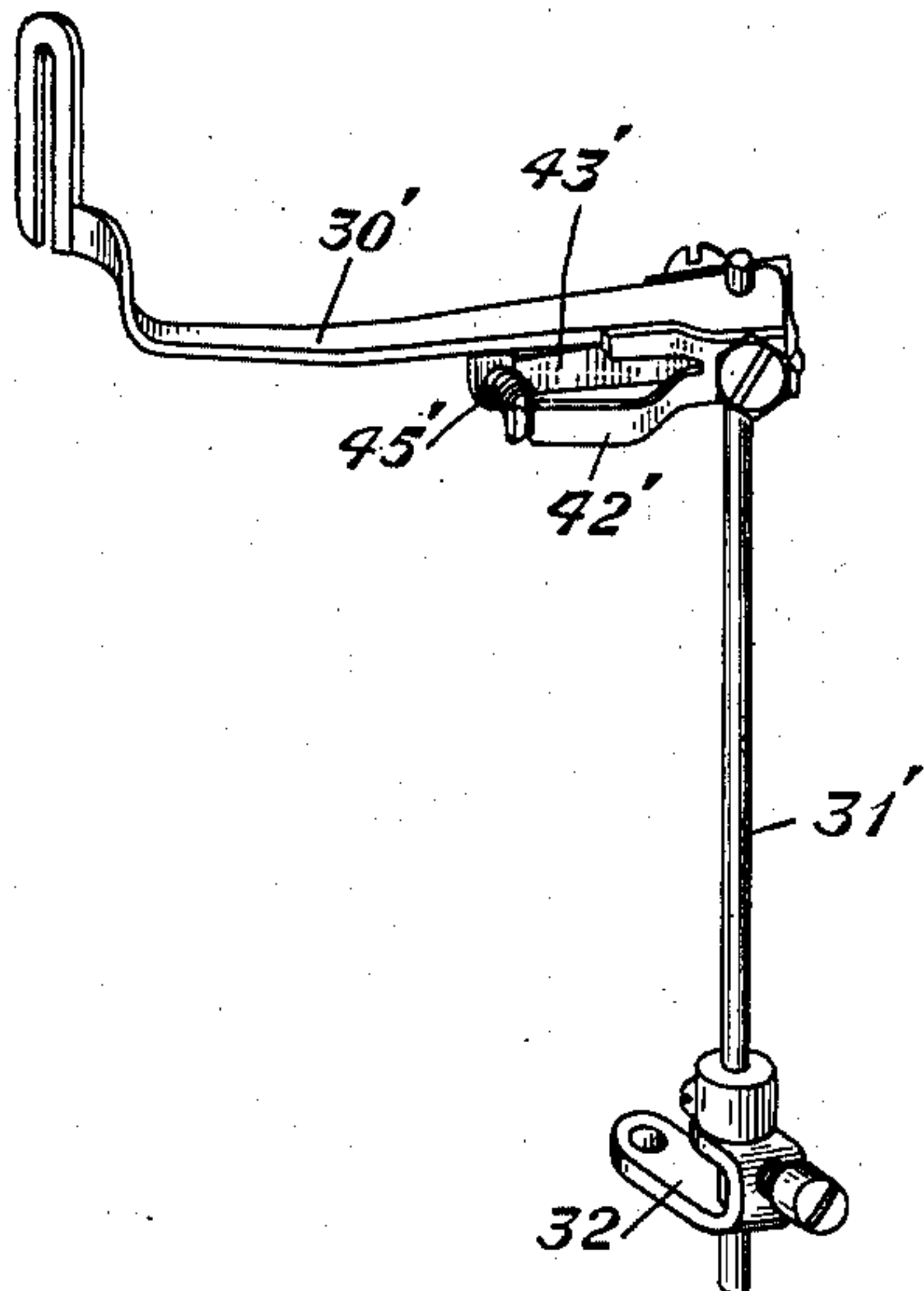


Fig. 1

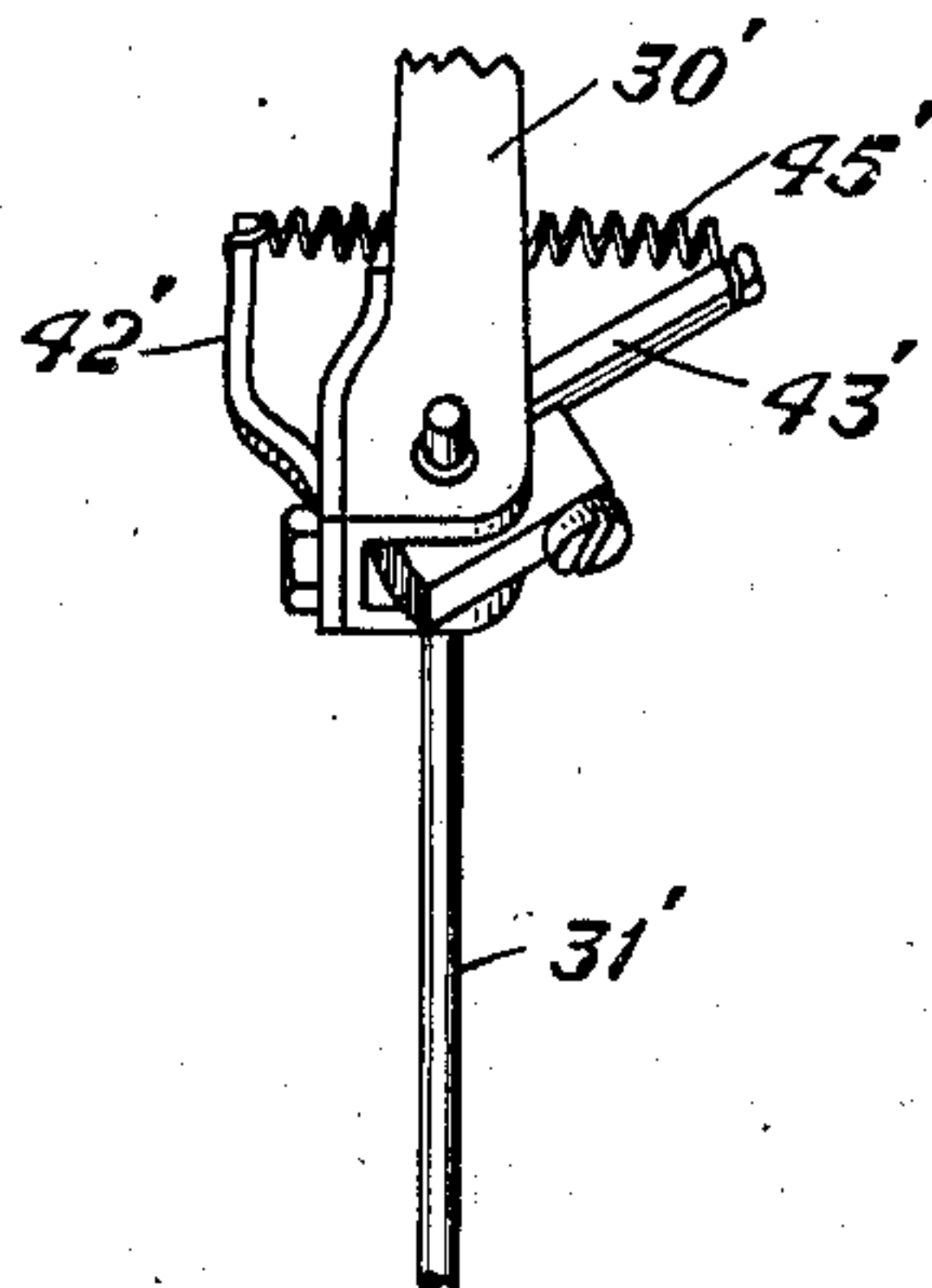


Fig. 2

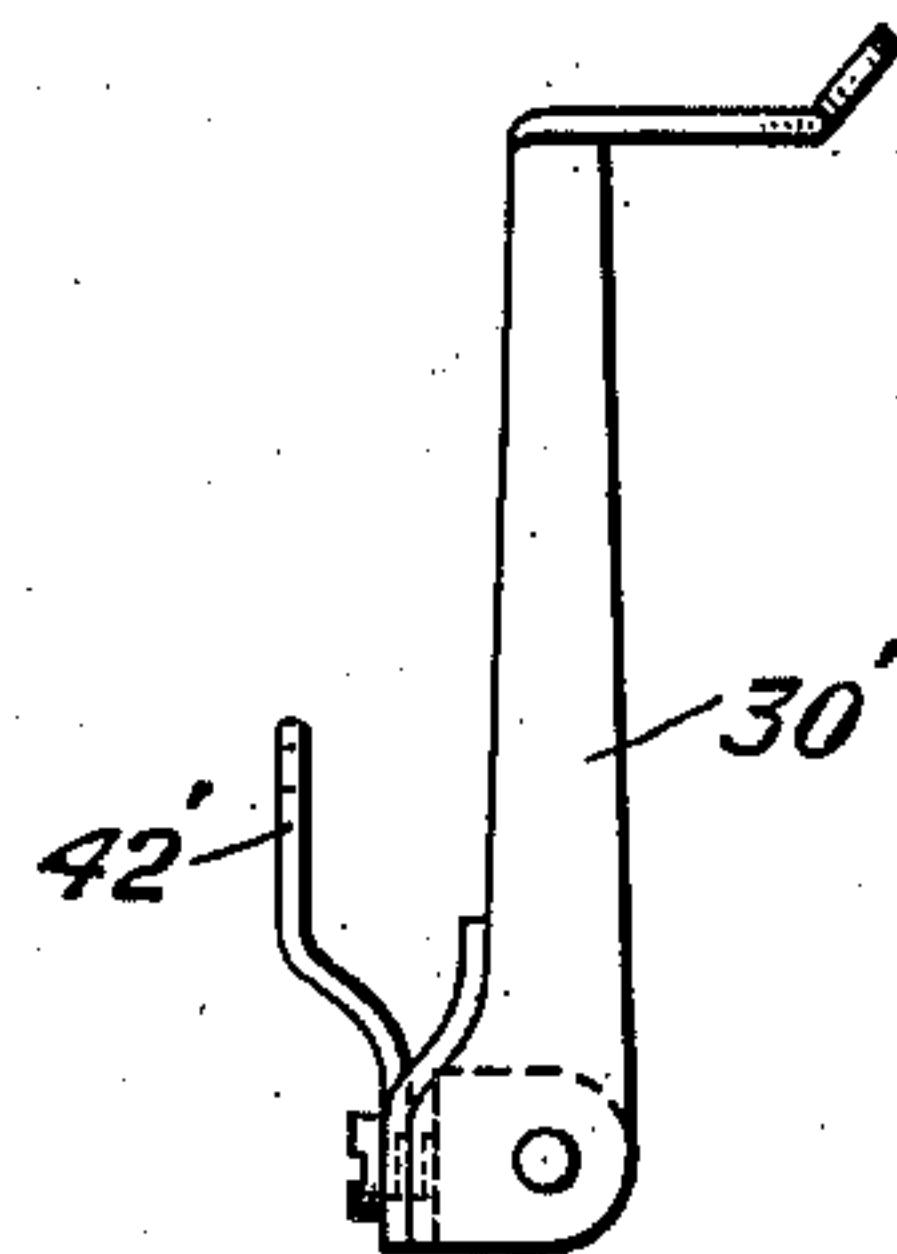


Fig. 3

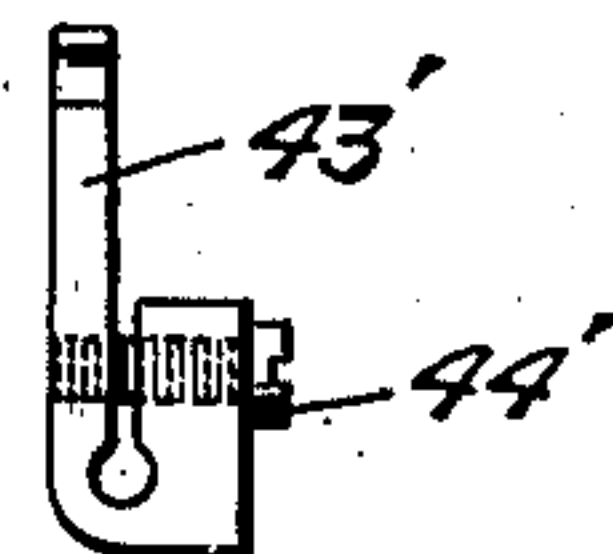


Fig. 4

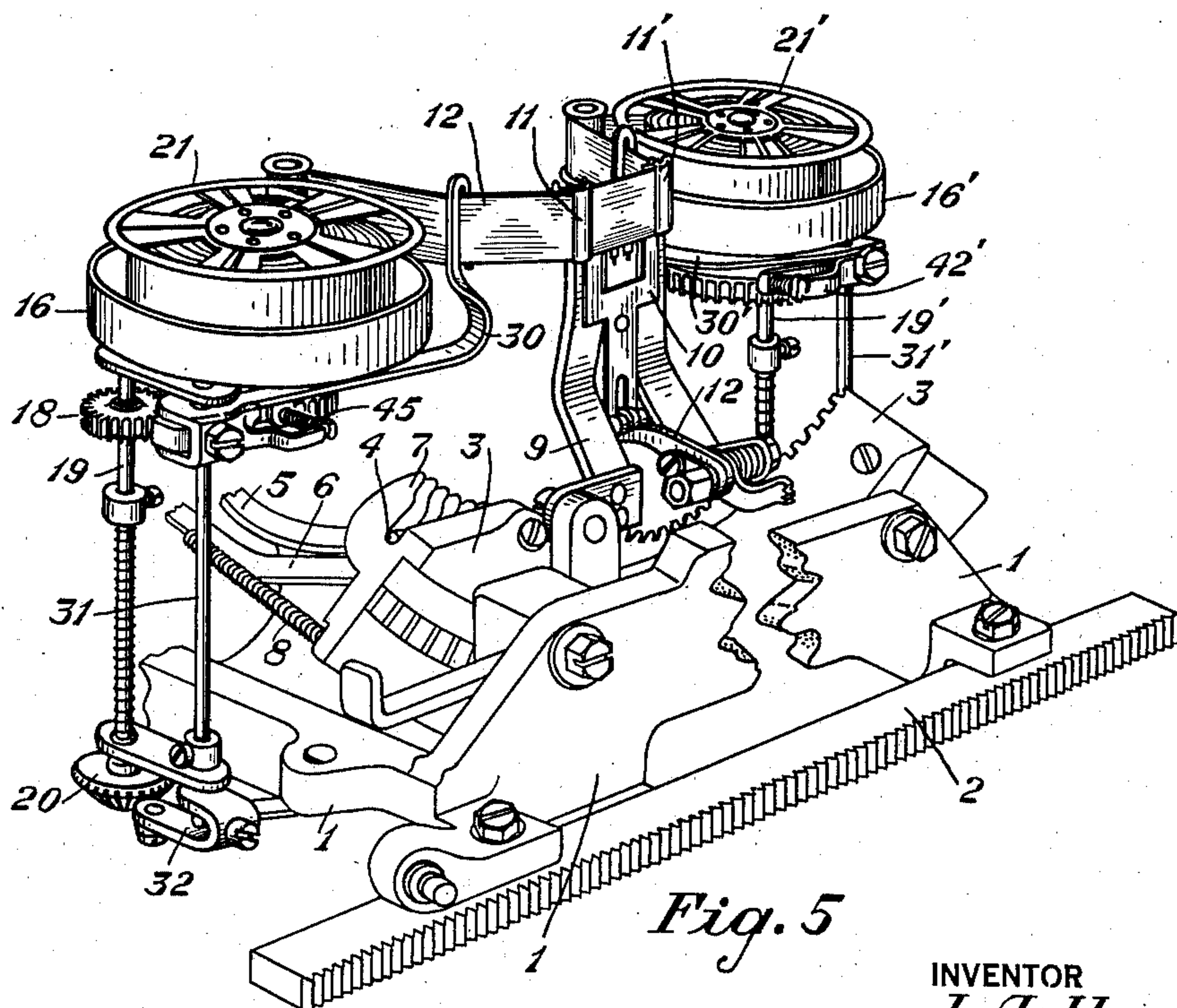


Fig. 5

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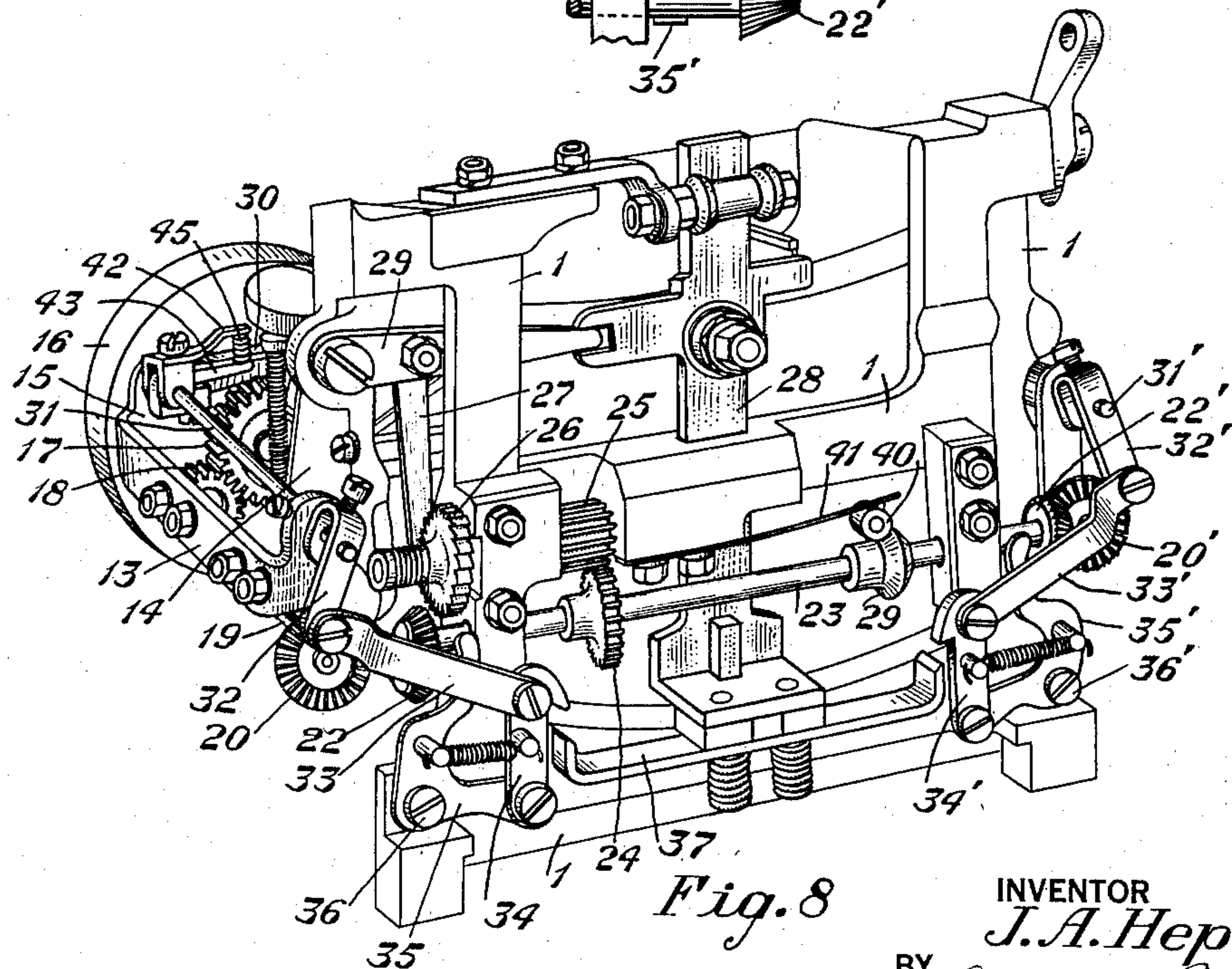
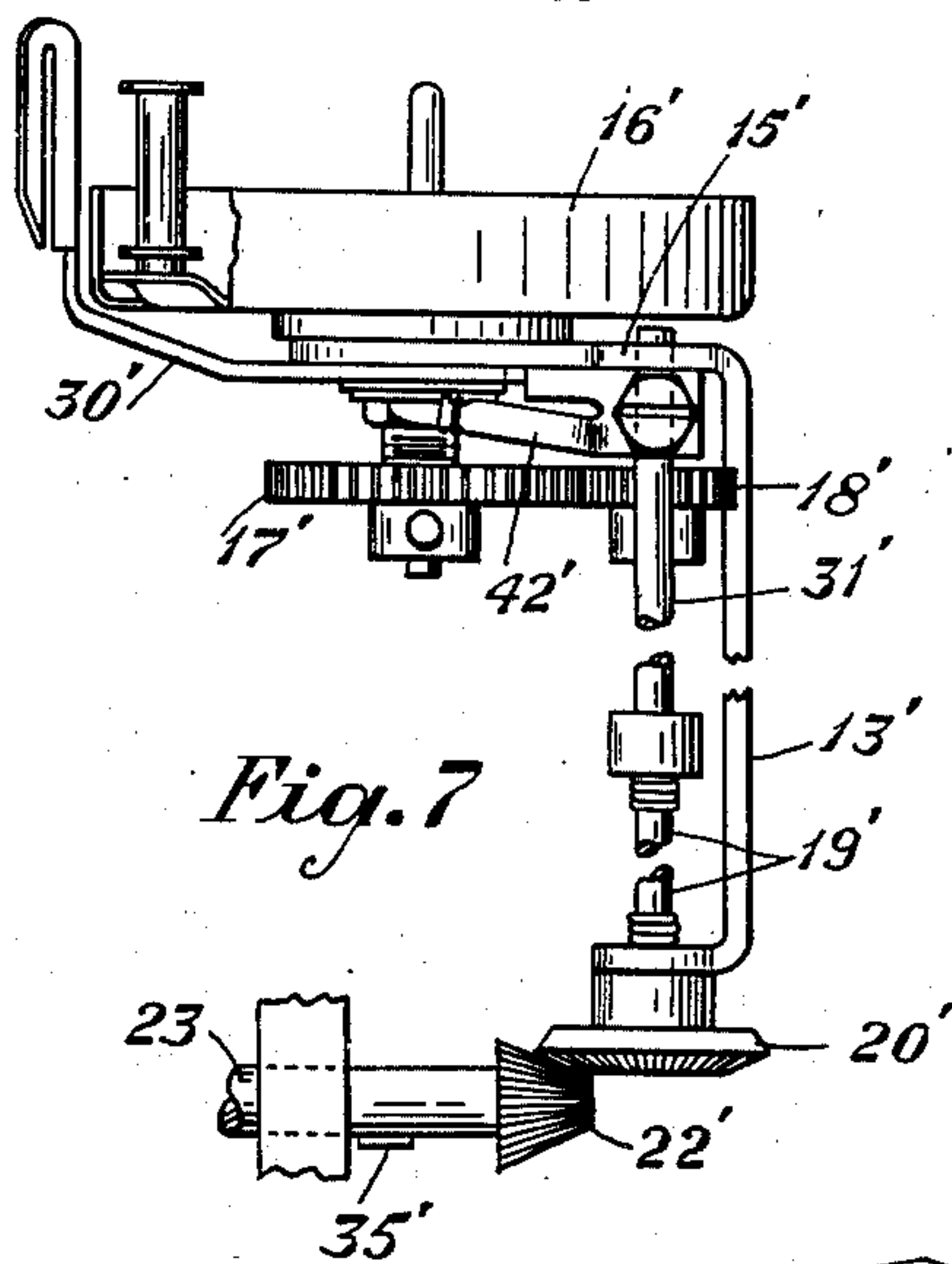
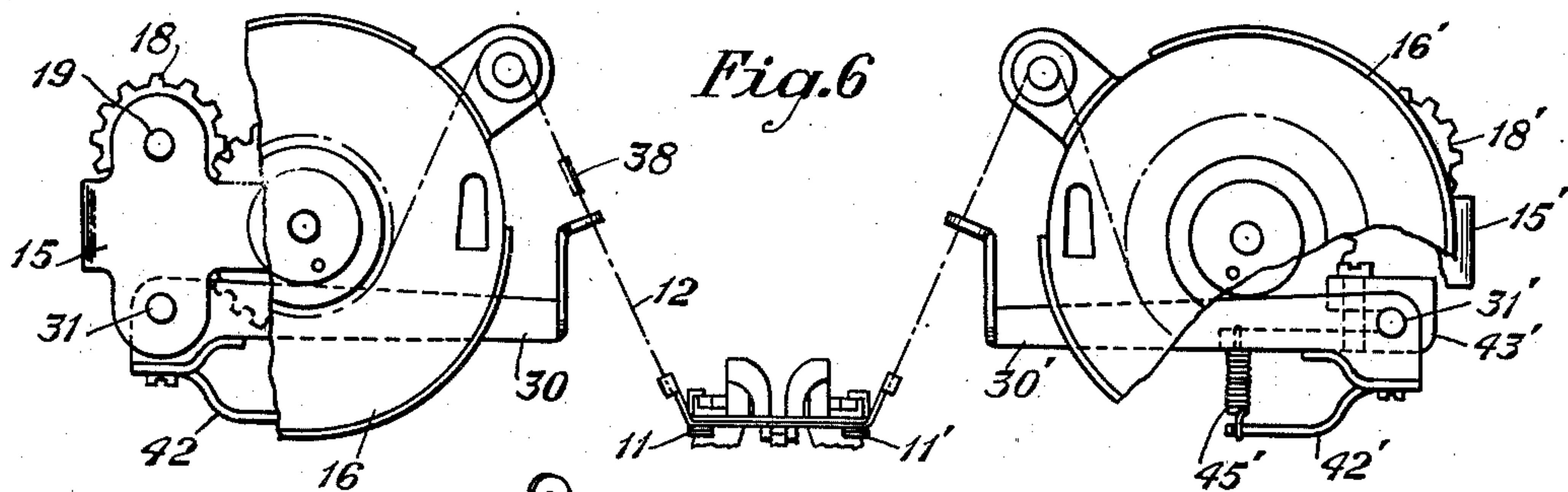
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RIBBON REVERSE MECHANISM

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2,257,553

RIBBON REVERSE MECHANISM

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Application February 6, 1941, Serial No. 377,642

4 Claims. (Cl. 197—165)

This invention relates to a ribbon reverse mechanism for a typing machine such as a typewriter or teletypewriter or the like, and is more particularly applicable to teletypewriter machines.

In a machine of the character above referred to the ribbon is wound upon one spool and is gradually unwound from that spool and wound upon another spool as the typing operation proceeds. When the ribbon approaches its end it operates a reversing mechanism which causes the ribbon to be unwound from the second spool and again rewound upon the first spool. This result is accomplished by having associated with each spool a ribbon reverse arm mounted upon a ribbon reverse shaft which operates the reversing mechanism. The ribbon reverse arm is usually provided with a slotted arrangement through which the ribbon passes, and as the ribbon approaches the end, a button or eyelet in the ribbon engages the reverse arm to rotate the reverse shaft through a small arc and thereby cause the reverse mechanism to operate.

There is, of course, a reverse arm and shaft associated with each ribbon spool, and it has been found in practice that occasionally an attendant, desiring to change the ribbon inadvertently moves one or the other of the ribbon reverse arms through a greater arc than it is intended to operate. This results in either moving the reverse arm with respect to the ribbon reverse shaft upon which it is mounted or else the reverse shaft is moved with respect to the lever clamped thereto at its bottom and which serves to operate the reversing mechanism. In either case the reversing mechanism is out of adjustment and does not operate properly.

The object of the present invention, therefore, is to provide a yielding arrangement in the ribbon reverse mechanism so that when the attendant inadvertently applies pressure against the ribbon reverse arms, slippage of the parts clamped to the ribbon reverse shaft will not occur.

The invention will now be more fully understood from the following detailed description, when read in connection with the drawings, in which Figure 1 shows how the ribbon reverse arm is mounted on the ribbon reverse shaft; Fig. 2 shows a detail of the yielding connection between the reverse arm and the shaft; Fig. 3 shows a plan view of the ribbon reverse arm; Fig. 4 shows the clamp associated with the ribbon reverse arm and which, when assembled, is mounted upon the end of the ribbon reverse

shaft; Fig. 5 is a perspective view of a portion of the type bar carriage of a teletypewriter showing particularly parts of the ribbon reversing mechanism as seen generally from the rear; Fig. 6 is a broken plan view, looking from above, of the ribbon spool cups with the ribbon spools mounted therein and of the ribbon shield and the associated ribbon reverse arms; Fig. 7 is a side view of a ribbon spool cup and its associated ribbon reverse arm together with certain other elements of the reversing mechanism; and Fig. 8 is a perspective view looking generally toward the bottom of the type bar carriage and showing parts of the ribbon reverse mechanism.

Referring to the drawings and particularly Fig. 5 thereof, portions of a main frame 1 for a type bar carriage are shown. Upon this frame a spacing rack 2 is mounted, the latter serving to move the type bar carriage step by step by means of a ratchet mechanism as the letters are printed. A type bar segment 3 is mounted on the front side of the frame 1 (Fig. 5 is a view looking from the rear) which is provided with a bearing rod 4 mounted in a suitable longitudinal groove and functioning as the pivot about which type bars such as 5 are caused to swing when actuated by a pull bar 6 in a well known manner. The various type bars and their associated pull bars are mounted to operate in parallel slots 7 in the type bar segment 3. The pull bars are held in their rearward position by means of coiled springs such as 8.

In front of the frame 1 but to the rear and above the type bar segment 3 a bracket 9 is mounted, said bracket having arms upon which the arms of a ribbon shield 10 are mounted to slide up and down. The arms of the ribbon shield 10 have slotted members 11 and 11' through which the ribbon 12 passes in such a manner that it may be stretched in front of a platen (not shown) during the printing operation. The ribbon shield 10 may be operated by means of a ribbon oscillator 12 in such a manner that after the character has been printed the ribbon shield is moved downwardly to pull the ribbon below the point on the platen at which the character was printed, thus enabling the operator to view the printed character.

Referring to Figs. 7 and 8, U-shaped brackets 13 and 13' are suitably mounted on projections such as 14 of the frame 1, as more clearly shown in Fig. 8. On the upper arms 15 and 15' of the bracket 13 and 13', respectively, ribbon spool cups 16 and 16' are rotatably mounted as shown in Figs. 5, 6 and 8. The pivotal mountings of

these cups have attached thereto on the opposite sides of the bracket arms 15 and 15' pinion gears 17 and 17' respectively. These mesh respectively with pinion gears 18 and 18' mounted upon vertical ribbon feed shafts 19 and 19' respectively. At the lower end of each of these shafts are beveled gears 20 and 20', by means of which the shafts may be rotated to in turn rotate the ribbon spool cups 16 and 16'.

The ribbon 12 is wound upon ribbon spools 21 and 21'. As shown in the drawing the ribbon is being unwound from the spool 21 and being re-wound on the spool 21'. By reason of the fact that the beveled gear 20' is in mesh with a beveled gear 22' carried upon a ribbon feed shaft 23, at the opposite end of which is another beveled gear 22, the beveled gear 22 is not, as shown, in mesh with its corresponding beveled gear 20 on the vertical feed shaft 19. The ribbon feed shaft 23 carries a ribbon feed shaft gear 24 which is in mesh with a ribbon feed ratchet gear 25. The latter is mounted on the same shaft with a ribbon feed ratchet 26 which is moved step by step by a pawl 27, the latter being operated by a plunger 28 through the medium of a lever 29. The plunger 28 is slidably mounted in the main frame 1 so that it is moved backward and forward (up and down in Fig. 8) each time a character is printed. As a consequence, each time a character is printed the pawl actuates the ribbon feed ratchet 26 one step. Thus the ribbon feed shaft 23 is rotated one step for each character and it in turn rotates the vertical ribbon feed shaft 19' one step for each character. This action continues until the ribbon is substantially unwound from the ribbon spool 21' and is substantially fully wound upon the ribbon spool 21, when a ribbon feed reversal takes place.

The mechanism for reversing the ribbon feed includes two ribbon reverse arms 30 and 30' yieldably mounted on the upper ends of ribbon reverse shafts 31 and 31' in a manner that will be described later. At the lower ends of the ribbon reversing shafts 31 and 31', short U-shaped arms or levers 32 and 32' are respectively fixed by means of set screws. From each of these arms or levers links 33 and 33' extend respectively to reverse pawls 34 and 34' pivotally mounted upon the ends of rocker arms 35 and 35', the latter being pivotally mounted by means of pivots 36 and 36' upon the main frame 1. The rocker arms 35 and 35' when rocked upon their pivots engage the back sides of the beveled gears 22 and 22', respectively, to move the ribbon feed shaft 23 longitudinally to cause engagement of the pairs of beveled gears 20 and 22, or 20' and 22', respectively.

With the ribbon reverse arms 30 and 30' in normal position the ribbon reverse pawls 34 and 34' are held out of engagement with the ends of the ribbon reverse bail 37 carried by the oscillating bail plunger 28. Consequently, while the bail 37 is oscillated back and forth each time a character is printed, it cannot affect any ribbon reversing action until one or the other of the arms 30 or 30' is actuated by the ribbon 12. In order to actuate one of these arms the ribbon 12 is provided with eyelets such as 38 (see Fig. 6) at either end thereof, and as the ribbon is unwound from the spool carried by the ribbon spool cup 16, for example, the eyelet 38 engages the slotted end of the arm 30, causing it to move in the direction of the guide 11 about its pivot 31.

As the arm 30 so moves it rotates the ribbon reverse shaft 31 through a small arc, thus shifting

the lower end of the arm or lever 32 in Fig. 8 to the right. This causes the link 33 to move the upper end of the ribbon reverse pawl 34 to the right so that its shoulder is engaged by the ribbon reverse bail 37 upon the next movement rearwardly (upwardly in Fig. 8) of the bail plunger 28. Upon this movement the end of the bail 37 engages the shoulder of the ribbon reverse pawl 34 and thereby rocks the rocker 35 about its pivot so as to rotate it in a counter-clockwise direction.

As a consequence, the upper part of the reverse arm engages the back of the beveled gear 22 and moves the ribbon feed shaft 23 to the left, so that the beveled gear 22' becomes disengaged from the beveled gear 20' and the beveled gear 22 engages the beveled gear 20. As the shaft 23 is moved, a shoulder 39 mounted thereon is snapped past a roller 40 carried by a spring arm 41 so that the shaft 23 will be held in the shifted position. When so shifted the shaft 23 is moved step by step by means of the pawl 27 and ratchet 26 each time a letter is printed. This causes the beveled gear 22, in mesh with the beveled gear 20, to drive the ribbon feed shaft 19, which acting through the pinion gears 17 and 18, causes the ribbon spool 21 to begin winding the ribbon thereon. As the ribbon 12 is wound upon the spool 21 it unwinds from the spool 21'.

When the ribbon is completely wound upon the spool 21, an eyelet near the other end of the ribbon operates the ribbon reverse arm 30', thus moving the ribbon reverse pawl 34' to the left. As a consequence it is engaged by the end of the bail 37 upon the next movement of the latter to rock the rocker arm 35' and shift the ribbon feed shaft 23 to the right, thus reversing the operation and causing the ribbon to wind up on the spool 21'.

In removing the ribbon 12 and the spools 21 and 21' and replacing them with a new ribbon and new spools, the attendant is apt to move one of the arms 30 or 30' further than it is intended to go, by inadvertently pressing against it with his fingers. This may force the arm to pivot about the ribbon reverse shaft 31 or 31' as the case may be, or it may force the shaft to rotate with respect to the levers 32 or 32'. In either event the ribbon reverse mechanism will be out of adjustment and will not operate properly. In order to prevent this the ribbon reverse arms 30 and 30' are mounted upon the shafts 31 and 31' by means of a yieldable mounting.

The details of this yieldable mounting are shown in the case of the arm 30' in Figs. 1, 2, 3 and 4. As shown in Figs. 1 and 2 the arm 30' is not fixed to the shaft 31' but is rotatably mounted on the upper end of said shaft, and carries at its butt end a small projecting arm 42', this arm 42' being fixedly mounted on said butt end of the ribbon reverse arm 30'. A second arm 43' has its butt end mounted between the two flanges of the butt end of the ribbon reverse arm 30' and is clamped to the ribbon reverse shaft 31' by means of a screw 44'. The arm 42' of the ribbon reverse arm is connected to the arm 43' fixedly attached to the shaft by means of a stiff coiled spring 45'. Consequently, as the ribbon reverse arm 30' moves counter clockwise with respect to the shaft 31', its arm 42' acting through the spring 45' carries with it the arm 43' which is fixedly attached to the shaft 31'. Thus the shaft 31' rotates in a counter clockwise direction with the ribbon reverse arm 30'.

However, the operator in working with the

ribbon may accidentally move the arm 30' counterclockwise further than it is intended to go, so that the shaft 31' in effect comes up against a stop. For example, if the ribbon reverse pawl 34' engages the bail 37, the spring 45' will begin to yield and permit the arm 30' with its associated arm 42' to continue to move in a counterclockwise direction. This it can do without causing any relative shifting, with respect to the shaft 31', of either the arm 43' at the top of the shaft 31', or the arm 32' at the bottom thereof. This yielding arrangement enables the ribbon reverse arms to be abnormally shifted without causing any maladjustment of the ribbon reverse mechanism. At the same time the arrangement permits the normal shifting of the ribbon reverse arm by means of the eyelet upon the ribbon to cause a corresponding rotation of the ribbon reverse shaft without undue yielding of the coiled spring 45' or 45 as the case may be.

It will be obvious that the general principles herein disclosed may be embodied in many other organizations widely different from those illustrated without departing from the spirit of the invention as defined in the following claims.

What is claimed is:

1. In a typing mechanism, a ribbon, a pair of spools, means to gradually unwind said ribbon from one of said spools and wind it upon the second spool, reversing mechanism to reverse the winding operation so as to rewind the ribbon upon the first spool, said reversing mechanism including a shaft for controlling the reversing operation, an arm associated with said shaft and engaging said ribbon, a member on said ribbon for moving said arm through a small arc to institute the reversal operation, and a yieldable connection between said arm and said shaft to permit an accidental movement of said arm greater than said small arc without causing damage to or maladjustment of said mechanism.

2. In a typing mechanism, a ribbon, a pair of spools, means to gradually unwind said ribbon from one of said spools and wind it upon the second spool, reversing mechanism to reverse the winding operation so as to rewind the ribbon upon the first spool, said reversing mechanism including a shaft for controlling the reversing

operation, an arm associated with said shaft and engaging said ribbon, a member on said ribbon for moving said arm through a small arc to institute the reversal operation, and a spring connected between said arm and said shaft to permit an accidental movement of said arm greater than said small arc without causing damage to or maladjustment of said mechanism.

3. In a typing mechanism, a ribbon, a pair of spools, means to gradually unwind said ribbon from one of said spools and wind it upon the second spool, reversing mechanism to reverse the winding operation so as to rewind the ribbon upon the first spool, said reversing mechanism including a shaft for controlling the reversing operation, an arm associated with said shaft and engaging said ribbon, a member on said ribbon for moving said arm through a small arc to institute the reversal operation, and a spring connected between said arm and an element fixed to said shaft to permit an accidental movement of said arm greater than said small arc without causing damage to or maladjustment of said mechanism.

4. In a typing mechanism, a ribbon, a pair of spools, means to gradually unwind said ribbon from one of said spools as typing takes place and wind it upon the second spool, said means including a driving shaft associated with each spool, reversing means to selectively operate said shafts so that one shaft will be operated to wind said ribbon on one spool under certain conditions and the other shaft will be operated under other conditions to reverse the operation and wind the ribbon on the other spool, a reversing shaft associated with each spool for controlling said reversing operation, an arm associated with each of said reversing shafts and engaging said ribbon, means carried by said ribbon for selectively operating one or the other of said reversing shafts to move it through a small arc to institute the reversing operation, and a yieldable connection between said arm and said shaft to permit an accidental movement of said arm greater than said small arc without causing damage to or maladjustment of said mechanism.

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