

April 26, 1932.

P. J. THOMAS

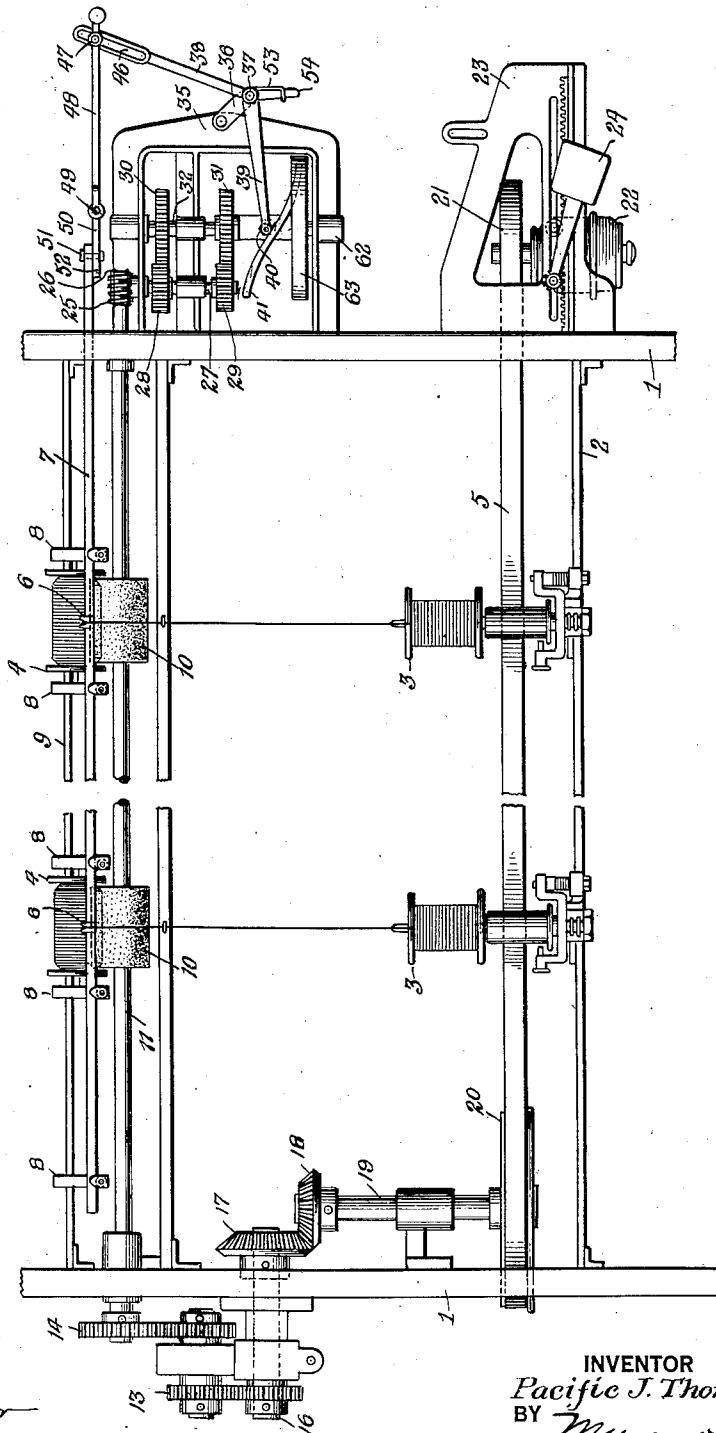
1,856,004

TRAVERSE MECHANISM

Filed April 24, 1930

3 Sheets-Sheet 1

Fig. 1.



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3 Sheets-Sheet 2

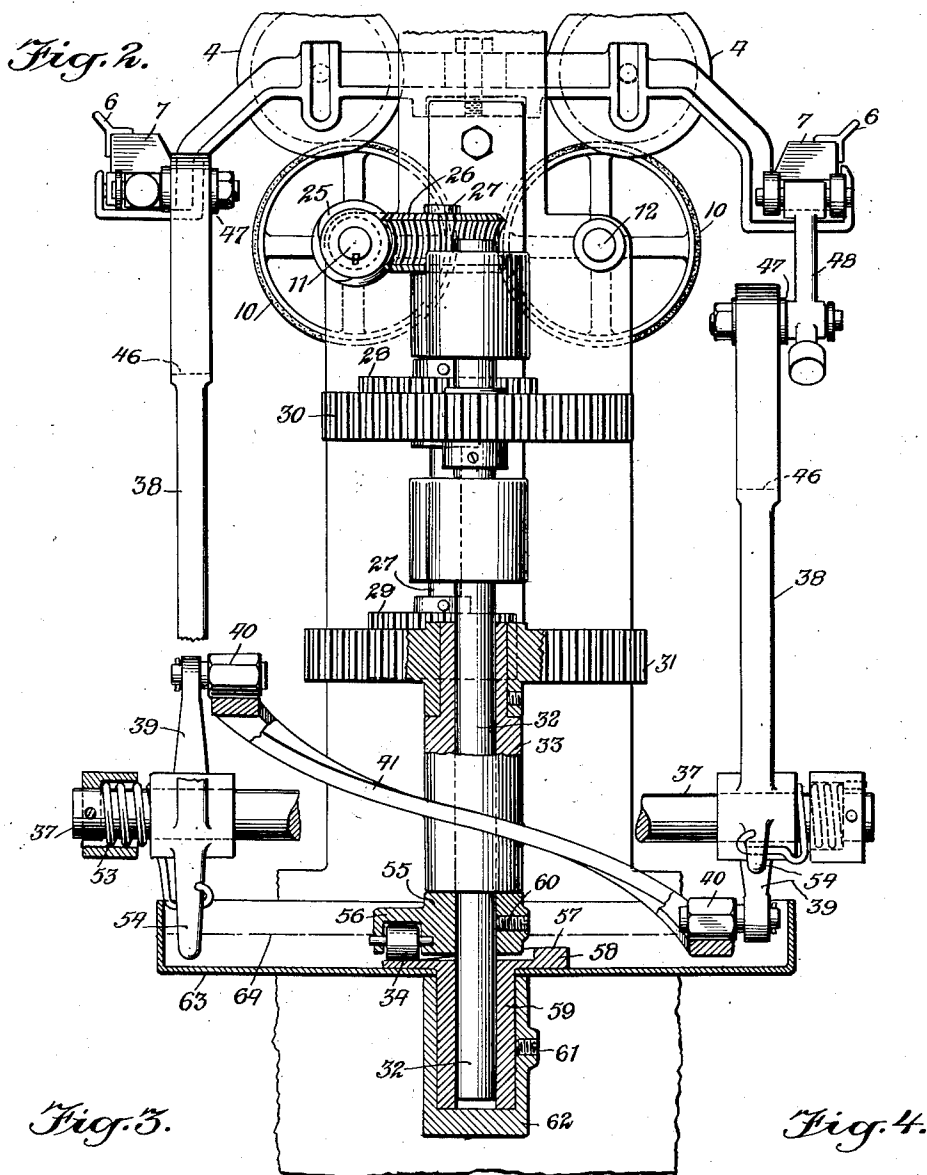


Fig. 3.

Fig. 4.

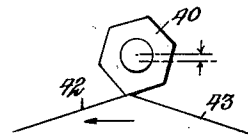
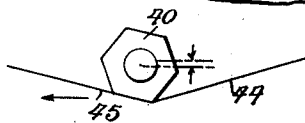
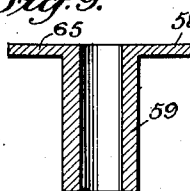
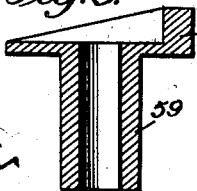


Fig. 8.

Fig. 9.



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3 Sheets-Sheet 3

Fig. 5.

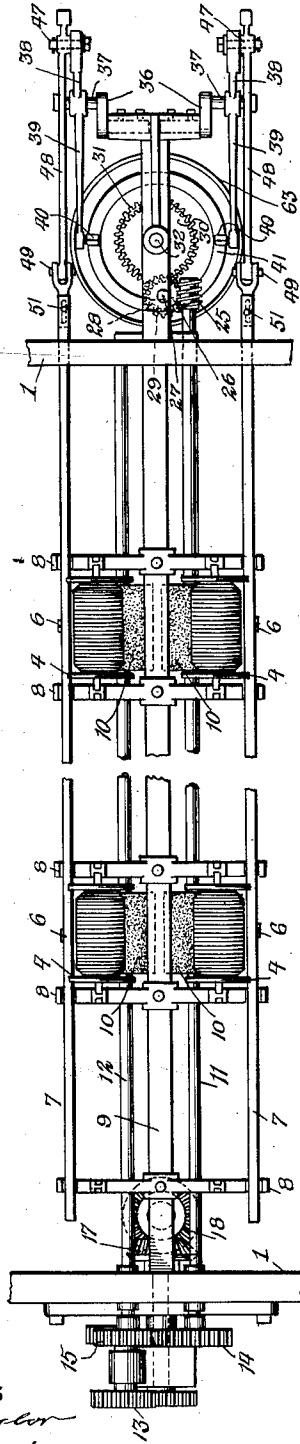


Fig. 7.

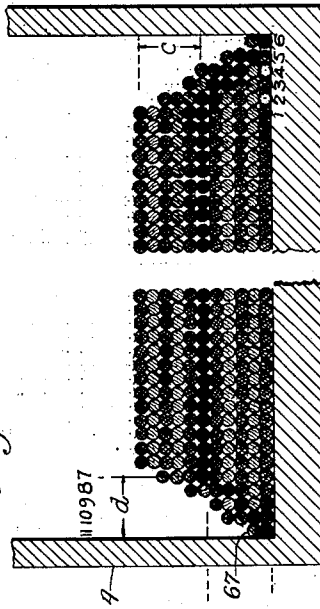
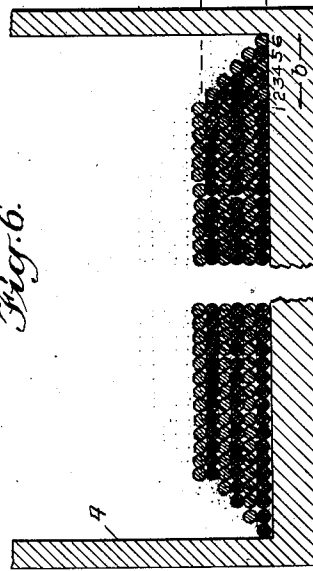


Fig. 6.



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UNITED STATES PATENT OFFICE

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TRAVERSE MECHANISM

Application filed April 24, 1930. Serial No. 446,992.

This invention relates to twisting machines, and particularly to an improved twisting machine which twists silk, the object of the invention being to provide an improved construction which may be adjusted to wind on a spool the thread immediately after twisting, and to build up the thread on the spool in a way whereby the thread will not press against the ends of the spool when the parts are adjusted in one way, and will wind the thread in the ordinary manner when the parts are set in a different position.

Another object of the invention is to provide a traverse mechanism for twisting machines wherein the operative position of the traverse bar is shifted during the winding operation, whereby the thread is built up on the spool without causing the thread to crowd against the ends of the spool.

A further object of the invention is to provide an improved traverse mechanism in connection with a tension device and belt drive whereby the twisting mechanism is operated at a speed proportionately to the traverse mechanism, regardless of whether the thread is being wound or placed on a spool in the usual manner or in a special manner.

In the accompanying drawings—

Figure 1 is a side view of the upper part of a twisting machine disclosing an embodiment of the invention;

Figure 2 is an end view on a large scale of the right hand end of the structure shown in Figure 1, certain parts being shown in section for better illustrating the construction;

Figure 3 is a diagram showing the low point on a cam illustrated in Figure 2, together with the contact shoe coacting therewith;

Figure 4 is a view similar to Figure 3 but showing a high point on the cam;

Figure 5 is a top plan view of the construction shown in Figure 1;

Figure 6 is an enlarged sectional view through part of a spool with part of a winding thereon illustrating how the different layers are positioned when the winding has been only partially applied;

Figure 7 is a view similar to Figure 6 show-

ing the winding in an advanced stage, and illustrating how the ends are built up without crowding the ends of the spool.

Figure 8 is a sectional view showing a modified form of stationary cam to that shown in Figure 2;

Figure 9 is a further modified form of cam to that shown in Figure 2.

Referring to the accompanying drawings by numerals 1 indicates a frame of any desired kind having suitable connecting and bracing bars 2 and other bars which form no part of the present invention except that they help make up the frame. This frame and associated parts make up what is known as a twisting machine and the same may be a single deck machine or a double deck machine.

In all twisting machines there is provided some form of support for the respective spools 3, and the thread or yarn for these spools passes through suitable guides to the respective spools 4. Different means have been provided for rotating the spools 3, and in the present instance an endless belt 5 is used as part of the mechanism for rotating the spools 3, whereby as the thread or yarn leaves these spools it is twisted before it reaches spool 4.

From Figure 1 it will be noted that the thread or yarn passes over a guide 6 for each spool 4. These guides are carried by a traverse bar 7. In the accompanying drawings the machine is shown with two traverse bars 7, with the other parts also doubled so that the machine will function properly and there will be presented pairs of spools 4 as shown in Figure 5.

For the purpose of illustration only two pairs of spools 4 have been shown, but it is evident that a large number are used in a twisting machine. The bar 7 acts to guide the threads back and forth as they are wound on these spools. The bars 7 are adapted to reciprocate and are supported in suitable brackets 8, whereby they may reciprocate preferably without the use of oil. The various brackets 8 are preferably carried by a centrally positioned bar 9 rigidly secured in any desired manner in the frame 1.

In order to rotate the spools 4 drums 10 are provided, said drums being preferably of cork or some other resilient material and secured to their respective shafts 11 and 12. A train of gears 13 act to drive shafts 11 and 12, there being one gear wheel on each shaft continually in mesh, one of these gear wheels being connected to the remaining train of gears.

As shown in Figure 5 gear wheel 14 is secured to shaft 11, while gear wheel 15 is secured to shaft 12, and as these gear wheels are of the same size and continually in mesh the shafts 11 and 12 are rotated at the same speed, gear wheel 15 being driven by the train of gears 13 one of which is secured to shaft 16. Said shaft 16 carries a bevel gear 17 which continually meshes with bevel gear 18 on shaft 19. Shaft 19 carries a large pulley 20 over which belt 5 passes. Belt 5 also passes over a driving pulley 21 driven by an electric motor 22 which is slidingly mounted on bracket 23. A weighted member 24 acts on motor 22 for tending to move the same in a direction away from pulley 20, whereby belt 5 is maintained taut at all times and power is transmitted through the belt to the various spools 3 and to the pulley 20 and from thence to the various mechanisms above described for rotating shafts 11 and 12. It will thus be seen that shafts 11 and 12 rotate in a certain ratio to the movement of the spools 3.

In my co-pending application Serial No. 443,545, filed April 11, 1930 the mounting of the motor 22 and its tension device is fully described so that no additional description will be necessary.

Shaft 11 at the end opposite the train of gears 13 is provided with a worm 25 which continually rotates as long as shaft 11 rotates. Worm 25 continually meshes with worm wheel 26. Worm wheel 26 is rigidly secured to a shaft 27. Shaft 27 carries pinions 28 and 29. Pinion 28 continually meshes with gear wheel 30 while pinion 29 continually meshes with gear wheel 31. Gear wheel 30 is rigidly secured to shaft 32, while gear wheel 31 is rigidly secured to sleeve 33. Gear wheels 30 and 31 are of slightly different sizes whereby when the device is in operation sleeve 33 will rotate at a lower rate of speed than shaft 32. The ratio shown in the accompanying drawings is such that there is about one-eleventh of a revolution difference, or, in other words, when the roller 34 is in its lowermost position, as shown in Figure 2, and is rotated eleven times, sleeve 33 and shaft 32 will be back to their starting point. It is, of course, understood that the relative size of the gear wheels can be varied so as to require more revolutions to secure this result or less revolutions. This arrangement is made in order to build up the thread or yarn on the spools 4 as illustrated in Figures 6 and 7, whereby there will be substantially no binding of the

thread against the end walls of the spools 4.

It will be noted from Figures 1 and 2 that the shafts 27 and 32 and associated parts are carried by the bracket 35 bolted or otherwise rigidly secured to the frame 1. The crank shaped member or bracket 36 is rigidly secured to bracket 35 and is provided with a stub shaft 37 on each side of the machine, as shown in Figure 5. As both sides of the machine are identical the description of one side will apply to both.

As illustrated in Figures 1 and 2 bracket 36 carries an arm 38 on the stub shaft 37, said arm having an extension 39 acting as a lever, said extension having an anti-friction member 40 rotatably mounted thereon. The anti-friction member 40 is preferably a hexagon shaped roller, as shown in Figures 2 and 3, whereby when it reaches the top of the rotatable cam 41, as shown in Figure 4, it will not hesitate but at the proper time will flop over from the surface 42 to the surface 43 and begin the downward movement. The same kind of a structure is arranged at the lowermost part of cam 41, as illustrated in Figure 3, the surfaces 44 and 45 extending in the opposite direction so that there will be a depression at this point rather than a ridge, as shown in Figure 4. The result, however, is the same as the anti-friction member 40 will flop over from the surface 45 to the surface 44, and consequently will not hold the parts stationary so that the bars 7 will immediately begin their return movement.

It will be noted from Figure 1 that arm 38 is provided with a slot 46 carrying a clamping pin 47 whereby link 48 is adjustably clamped on arm 38. Link 48 is hingedly connected at 49 to an adjusting plate 50, said plate carrying a clamping bolt 51 extending through slot 52 in plate 50 and through an aperture in the bar 7. This allows a longitudinal adjustment of bar 7, but not a lateral adjustment.

Spring 53 surrounds the stub shaft 37, as shown in Figure 2, and acts on the stub shaft and on the extension 54 of arm 38 for giving this arm a tendency to move to the left, as shown in Figure 1. This causes member 40 to always press against the surface of cam 41, and as cam 41 rotates spring 53 causes the bars 7 and associated parts to move to the left, as shown in Figure 1. When cam 41 is functioning to move extension 39 and arm 38 it does so against the action of the spring 53. In this way spring 53 moves the bar 7 in one direction and cam 41 moves the bar in the opposite direction.

An open faced cam has been shown as cam 41, but if desired a grooved cam may be used without departing from the spirit of the invention. It is to be noted that cam 41 is rigidly secured to sleeve 33, and that sleeve 33 has gear wheel 31 rigidly secured thereto, which sleeve is also loosely mounted on shaft

32 so as to rest on collar 55. Collar 55 carries an extension 56 in which is rotatably mounted roller 34 which moves continually on the face 57 of cam 58.

5 Cam 58 is provided with a tubular extension 59 in which the lower part of rod on shaft 32 extends. A set screw 60 rigidly secures collar 55 to shaft 32, while the set screw 61 rigidly secures the tubular extension 59 on cam 58 to the hollow enlargement 10 62 on bracket 35.

In order to catch any drippings of oil from the various gear wheels and other moving parts, and also in order that roller 34 may 15 operate in oil, a pan 63 is clamped to the enlargement 62 by cam 58, as shown in Figure 2. This pan is sufficiently deep to reach substantially to the top of collar 55, whereby when there is a level of oil indicated by the 20 line 64, roller 34 and stationary cam 58 will be continually lubricated. Also, cam 41 extends downwardly into the oil pan 63, as shown at the right of Figure 2, whereby this cam is maintained oiled so that the anti- 25 friction member 40 will properly function.

As the collar 55 rotates at a different speed to the sleeve 33 it requires a certain number of revolutions of both members before they can register again. It will be noted that cam 30 58 is of a certain height in Figure 2 and consequently will elevate the cam 41 a certain distance at each one-half revolution, and will then lower the cam 41 at each one-half revolution.

35 In Figure 8 a modified form of cam 58' is shown wherein the cam surface is made higher at the high point and consequently there will be a greater lift to cam 41, and consequently a greater action with regard to 40 the way the ends of the threads are arranged on the spools 41. In case it is desired to have an ordinary straight winding without the ends tapering, as shown in Figures 6 and 7, cam 58'' may be used, said cam having a flat 45 surface 65. Instead of using cam 58'', pinion 28 and gear wheel 30 can be eliminated and sleeve 33 rigidly secured to shaft 32. When this is done collar 55 will be also eliminated. By arranging the parts as just described 50 there will be no up-and-down movement of cam 41 and consequently the reciprocation of bars 7 would be the same at all times so that the threads will be laid on the spool evenly from one end to the other, whereby while 55 lifting and lowering cam 41 the operating position of the arm 48 is gradually shifted to cause the operating position of the bar 7 to be gradually shifted, thus laying the threads on the ends as illustrated in Figures 6 and 7.

60 In Figure 6 the threads 66 are shown as they would appear after the roller 34 has made eleven revolutions. After this has been done the roller 34 and associated parts will repeat their operations and consequently the 65 first revolution of the parts will place the

first yarn 67 as shown in Figure 7 and later on build up the other yarns as shown in black in Figure 7.

In this way the cone or tapering at the ends is maintained and the threads are not pinched 70 between the wound portion and the end of the spool 4 when the end winding or layer of threads are in the position as indicated by the numeral 67 in Figure 7.

What I claim is:

75 1. A cross winding traverse mechanism for twisting machines, comprising a reciprocating traverse bar, an arm for moving said bar, means for moving said arm in one direction, a movable cam for moving said arm in the 80 opposite direction, a stationary cam, means acting on said stationary cam for causing said movable cam to shift the operative position of said arm and thereby cause said bar to function in different positions. 85

2. A traverse mechanism comprising a reciprocating bar, a pivotally mounted arm for moving said bar, a movable cam for swinging 90 said arm to cause the arm to function in one direction, means for causing said arm to function in the opposite direction, a stationary cam, and means acting on said stationary cam and on said movable cam for moving said 95 movable cam to a different operative position and thereby cause said arm to function in a different position at each operation.

3. A traverse mechanism comprising a reciprocating bar, a pivotally mounted arm for reciprocating said bar, a rotatable cam acting 100 to swing said arm to cause the arm to move in one direction, spring means for moving said arm in the opposite direction, a stationary cam, and means coacting with said stationary cam and said rotatable cam for 105 causing said rotatable cam to move upwardly gradually during the functioning of the machine for causing said arm to function in a different position on each rotation of said rotatable cam.

4. A traverse mechanism including a reciprocating bar, a pivotally mounted arm for reciprocating said bar, a movable cam 110 for swinging said arm to cause the arm to move in one direction, means for causing said arm to move in the opposite direction, a stationary cam and means acting on said stationary cam for gradually raising and lower- 115 ing said movable cam and thereby cause the movable cam to function from a different position at each rotation. 120

5. A cross winding traverse mechanism including a reciprocating traverse bar, a pivotally mounted arm for reciprocating said bar, a rotatable cam acting on said arm for 125 moving the arm in one direction, means for moving said arm in the opposite direction, and means for gradually raising and lowering said cam, said means including a stationary cam, and means including a roller 130 moving on said stationary cam and acting to

continually support said movable cam and raise and lower the same as the roller moves over said stationary cam.

6. A traverse mechanism including a reciprocating bar provided with thread guides, a pivotally mounted arm for reciprocating said bar, said arm having an extension, a rotatable cam coacting with said extension for swinging said arm in one direction, means for swing the arm in the opposite direction, a circular stationary cam, and a rotatable collar for supporting the rotatable cam, said collar having an extension radiating therefrom, an anti-friction device carried by said extension contacting with the stationary cam, whereby as the collar rotates it will raise and lower said rotatable cam so that the cam will act on said arm from different positions and thereby vary the stroke of said traverse bar.

7. A cross winding traverse mechanism for twisting machines, including a driving means having a driving shaft in combination with means operated by the driving shaft for reciprocating the traverse bar of the twisting machine, said means including a shaft, a sleeve mounted on said shaft, gears connected with said shaft for rotating the same, gearing connected with said sleeve for rotating the same independently of the shaft, a cam rigidly secured to said sleeve, a pivotally mounted arm coacting with said cam, and swung by said cam in one direction, means for swinging the arm in the opposite direction, and means for connecting one end of the arm with said traverse bar whereby the traverse bar is reciprocated as said cam is rotated.

8. A traverse mechanism including a reciprocating bar, a pivotally mounted arm for reciprocating said bar, a spring for actuating said arm in one direction, a rotatable cam for actuating the arm in the other direction, means including a stationary cam for raising and lowering said cam for causing the cam to function in progressively different positions.

9. A cross winding traverse mechanism for twisting machines, including a traverse bar, a pivotally mounted arm, articulate means for connecting the bar with said arm, a spring for moving the arm in one direction, a rotatable cam for moving the arm in the opposite direction, a rotatable collar supporting said cam, said collar moving at a different speed to the cam, a stationary cam acting as a support for said collar whereby as the collar rotates over the stationary cam it will raise and lower the first-mentioned cam, and by reason of the different speeds of the collar and first mentioned cam the first mentioned cam will be caused to swing said arm the same distance at all times but shift said arm to different operative positions in a certain sequence.

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