Jan. 14, 1941. R. HETHERINGTON 2,228,519

ELECTRIC GUIDER FOR TRAVELING STOCK

Filed Jan. 30, 1939 4 Sheets-Sheet 1

Fig. 1.

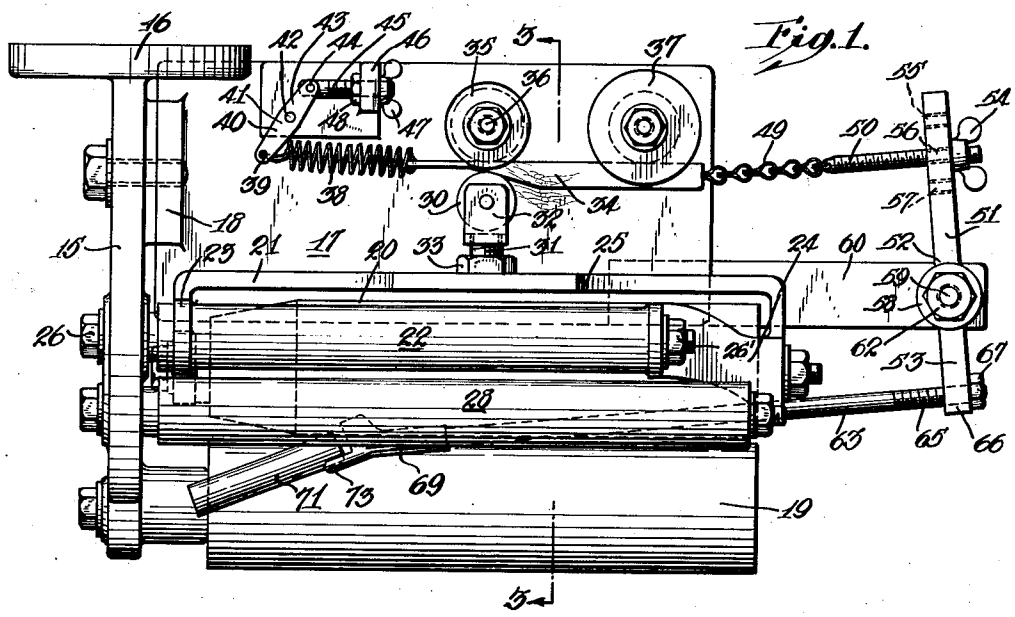


Fig. 2.

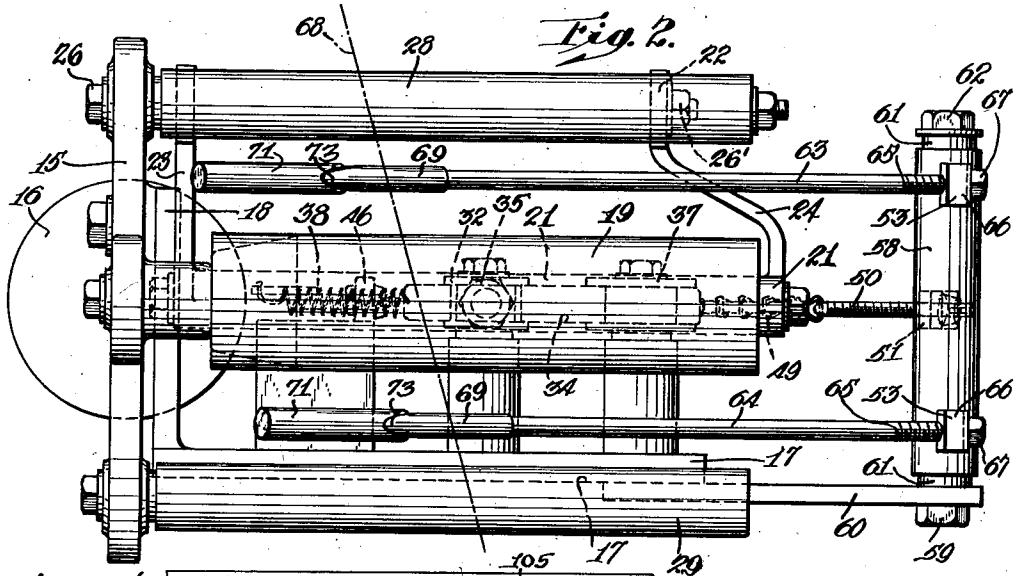
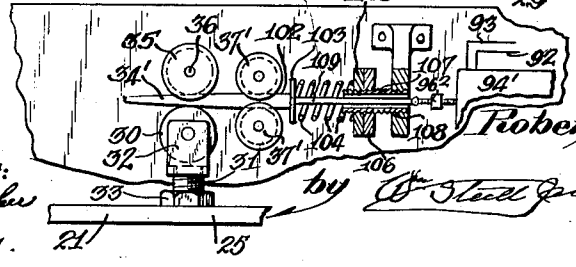


Fig. 10.



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Jan. 14, 1941. R. HETHERINGTON 2,228,519

ELECTRIC GUIDER FOR TRAVELING STOCK

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Fig. 3.

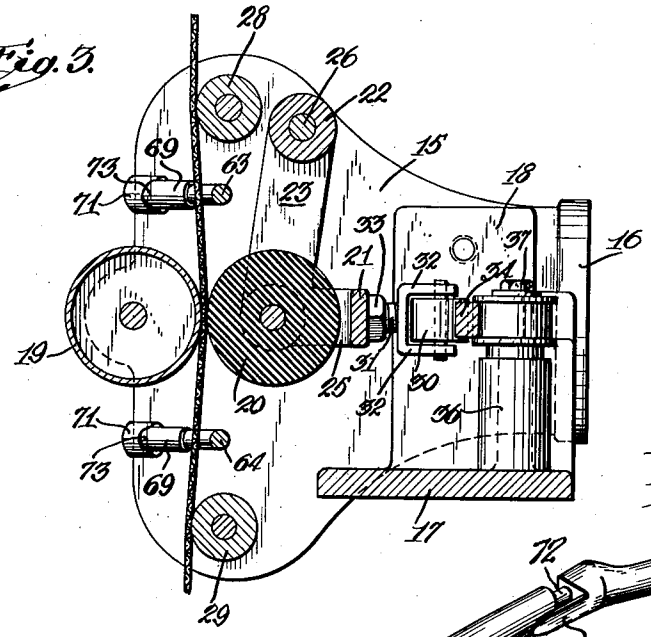


Fig. 4.

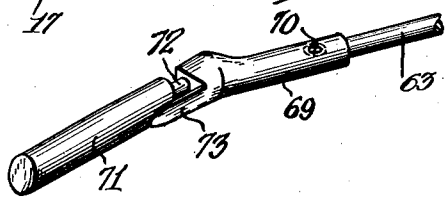


Fig. 5.

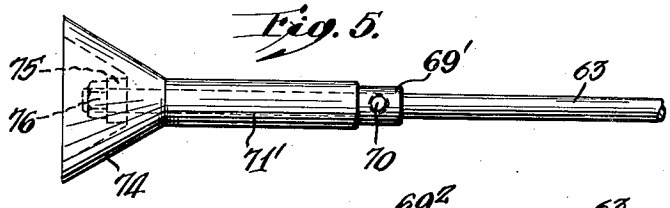


Fig. 6.

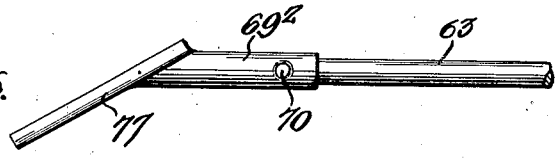
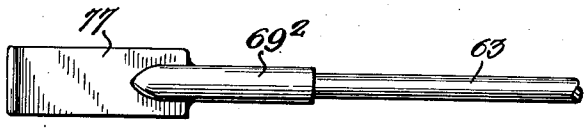


Fig. 7.



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ELECTRIC GUIDER FOR TRAVELING STOCK

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Fig. 8.

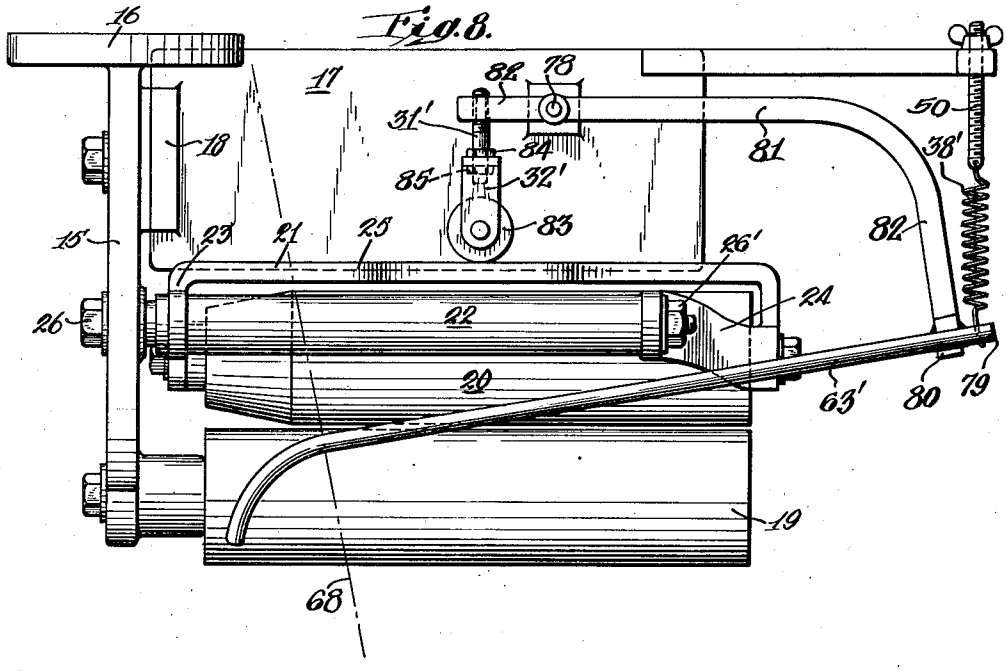
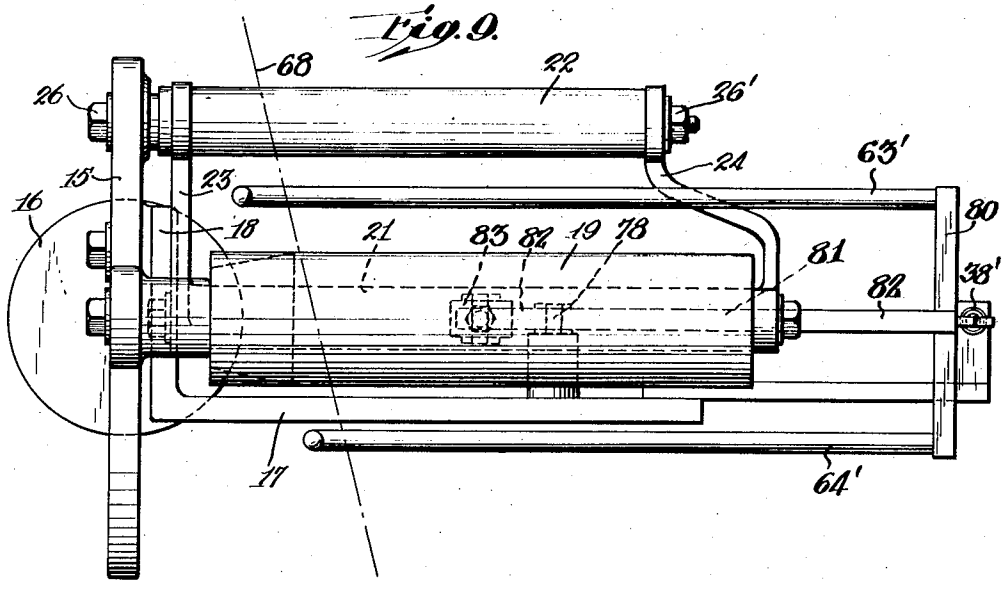


Fig. 9.



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Jan. 14, 1941. R. HETHERINGTON 2,228,519

ELECTRIC GUIDER FOR TRAVELING STOCK

Filed Jan. 30, 1939 4 Sheets-Sheet 4

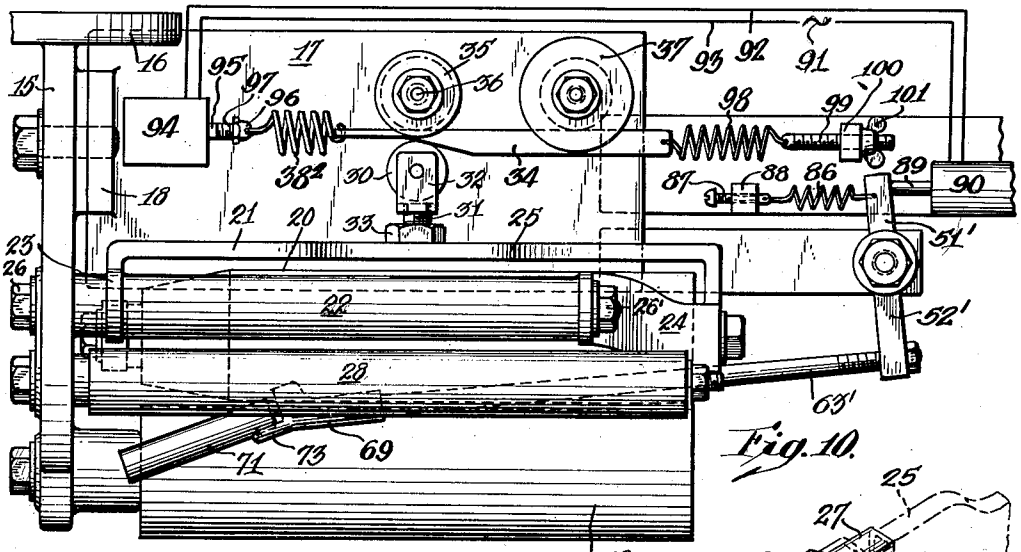


Fig. 10.

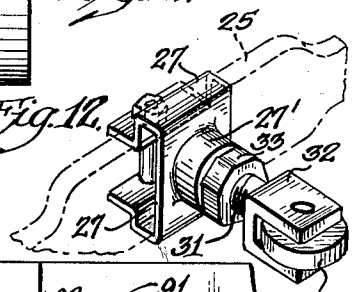


Fig. 12.

Fig. 11.

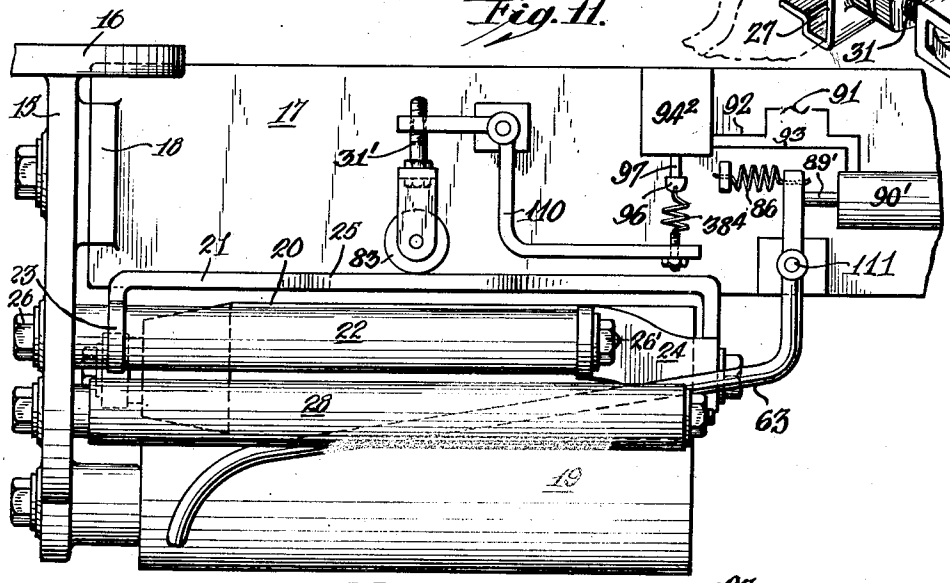
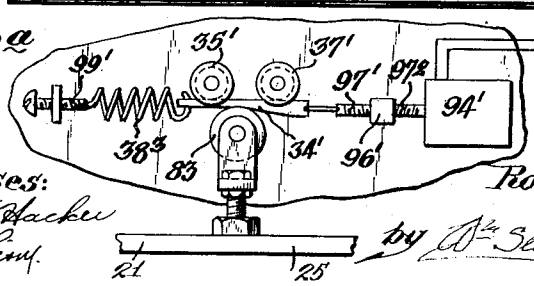


Fig. 10a.



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Patented Jan. 14, 1941 2,228,519

UNITED STATES PATENT OFFICE

2,228,519

ELECTRIC GUIDER FOR TRAVELING STOCK

Robert Hetherington, Sharon Hill, Pa.

Application January 30, 1939, Serial No. 253,565

18 Claims. (Cl. 271—2.6)

My invention relates to guiders intended to keep a textile fabric or other sheet material, herein referred to as "stock" stretched and properly in line during passage to a roll upon which it is being wound.

The main purpose of the invention is to procure simplicity of guider operation with consequent reduced cost of manufacture and for repairs.

A further purpose is to avoid pressure in the plane of the stock upon the edge of the stock being wound.

A further purpose is to perform all of the guiding functions by reason of the purely mechanical pressure of the face of the stock against guider operating mechanism.

A further purpose is to operate a guider by a lever which bears against the face of the stock as distinguished from bearing against the edge of the stock.

A further purpose is to provide operating mechanism which engages the stock with roll surfaces using antifriction bearing devices.

A further purpose is to separate the guide rolls of a pair normally by spring set cam means and to cause engagement of the rolls against the stock by lever engagement with the face of the stock effective to overcome the action of the spring.

A further purpose is to locate levers or feeler fingers on opposite sides of the guider rolls so as to secure increased strength or delicacy of operation.

A further purpose is to provide cam operated pressure means for holding the movable roll of a textile guider against its main roll, to normally hold the cam in operation by spring means and to provide a second spring for assistance of the operating means in the release of the movable roll.

A further purpose is to control spring-operated setting means for the movable roll of a guider roll pair by electromagnetically altering the effect of the spring.

A further purpose is to provide a mechanically set guider with electromagnetic control of the operating position of the guider parts.

A further purpose is normally to press the movable roll of a guider pair against its mate by a spring and to set or release the spring by electromagnetic means controlled by a feeler finger and a switch operated thereby.

A further purpose is to provide spring operation of a lever or wedge adapted to hold the rolls of a textile guider tightly together and to bring the spring into operation to tighten or to release the lever or wedge by feeler finger control of an electromagnet.

A further purpose is to draw guider rolls resiliently together by a spring held in effective position by an electromagnet having a normally closed circuit and to release the spring by feeler finger interruption of the circuit of the electromagnet.

A further purpose is to use a tension spring acting through lever or wedge means to hold rolls together and to alter the effect of the spring by electromagnetic operation controlled by feeler finger operation of a switch.

A further purpose is to apply wedge pressure to guiding rolls by a spring and to release the wedge electromagnetically against the force of the spring, the electromagnet circuit being preferably normally open.

My invention relates not only to methods of operation but to mechanism by which the methods may be carried out.

Further purposes will appear in the specification and in the claims.

I have preferred to illustrate a few only of the structures known to me for practicing my invention, selecting structures which I regard as practical, efficient, reliable and inexpensive, but which have been selected primarily because they well illustrate the principles of the invention.

Figure 1 is a top plan view of a preferred form of mechanical guider.

Figure 2 is an elevation of the structure seen in Figure 1, taken from the rear of the machine.

Figure 3 is a section of Figure 1, taken upon the line **3—3**.

Figure 4 is perspective view of a lever terminal seen in Figures 1 and 2.

Figures 5 and 7 are elevations of different operating lever terminals.

Figure 6 is a top plan view of the structure seen in Figure 7.

Figure 8 is a top plan view of an alternative structure.

Figure 9 is an elevation of the structure seen in Figure 8.

Figures 10, 10*a*, 10*b* and 11 are top plan views respectively of electrical guiders having characteristics similar to the guiders seen in Figures 1 and 8, 10*a* and 10*b* being fragmentary.

Figure 12 is a perspective view of a fastening clip.

My invention is intended to fit in with and be applicable to existing and conventional roll

guiders and for this reason conventional guider support, fixed and movable roll mounts and guides are shown. The conventional bracket 15 is secured to other machinery by base 16. The apron 17 is attached to the bracket by flange 18. Bodily fixed and bodily movable rolls 19 and 20 are shown, the latter mounted upon a cradle 21. The cradle comprises a sleeve 22, arms 23 and 24 and yoke 25, all suspended from a bolt 26 held in place by nut 26'. Guide rolls 28 and 29 are mounted on the bracket by suitable bolts.

Taking up first the form of Figures 1 and 2, the yoke is moved by pressure upon the roller 30 carried by the yoke through stud 31 and spaced ears 32. The stud is threaded into the yoke and is thus adjustable. It is held in adjusted position by a lock nut 33. In Figure 12 the roller, stud and spaced ears cooperate with a clip 27 intended to be bolted to the pad of the cradle yoke. The clip is spread out at the center into an internally threaded tube 27' to which attachment of the stud is made as in the other figures.

The wedge 34 is used to swing the yoke and to press the movable roll toward the fixed roll. It lies between the roller 30 and the grooved roller 35 mounted upon a fixed axis by stud and nut 36. Guide roller 37 supports the wedge. The wedge is normally drawn to position between the two rollers 30 and 35 by a spring 38 whose rear terminal 39 is fixed in use.

For convenience of adjustment, in order to get the desired position and tension for operation of the parts, the terminal 39 is located in the arm 40 of a lever 41 pivoted at 42. The opposite end 43 of the lever is connected by pin 44 to a bolt 45 which passes through a fixed flange 46 and is adjusted in this flange by a wing nut 47. It is locked in adjusted position by a nut 48.

The wedge is connected in any suitable manner as by a chain 49 with a screw 50 held in position within the lever arm 51 of a composite lever 52. At the opposite end of the lever two lever arms 53 are located.

The screw engages threads in the lever arm 51 and is locked in its position by a wing nut 54. The lever arm 51 is apertured and threaded at a number of points 55, 56, 57 so that the screw 50 can be inserted in any one of these apertures to give correspondingly variant leverages.

The lever 52 is pivoted by a barrel 58 upon a bolt 59 supported by an extension 60 of the apron 17. Suitable bearings are supplied. These may include race members 61 held in place by nut 62. The lever arms 53 carry stock-engaging levers 63, 64.

For convenience of manufacture and to allow easy adjustment of the length of the arms both levers 63 and 64 are made up of rods threaded at 65 into the ends 66 of the lever arms 53, being held in position therein by lock nuts 67. The two levers 63 and 64 terminate, respectively above and below the pair of rolls between which the traveling stock is passed and which is guided in its position lengthwise of the rolls by tightening or slackening the grip of the movable roll. This is best seen in Figures 2 and 3.

The guider is so located that the axes of the guide rolls are diagonal to the path of the traveling stock. For convenience of illustration the positions of the guide rolls have been shown in Figure 2 as if the guider were directly transverse, and the traveling stock were diagonal, the line of the stock being shown at 68.

All the guiders may be used for guiding alone, stretching alone or combined guiding and stretching.

The position of this line will vary according to whether the guider is doing almost wholly stretching work, in which it will lie in the general position indicated in Figure 2 or almost wholly guiding work when it will appear about as in Figures 8 and 9.

The levers 63 and 64 are diagonal to the plane of the traveling stock near their ends, where they are intended to be engaged by it. These ends may be parallel to each other. The purpose and effect is that as the grip of the movable roll against the traveling stock and through it against the fixed roll causes the traveling stock excessively to move over to the left in Figure 1, the face near the edge rather than the edge of the traveling stock will engage one at least and preferably both levers 63 and 64, rocking the lever 52 about its axis as a center and pulling upon the chain 49 against the resistance of the spring. This releases the wedge pressure, releasing pressure of the movable roll partly or wholly and thus allows the traveling stock to move toward the right until the pressure of the face of the stock upon the levers 63 and 64 has slackened sufficiently to allow the spring again to pull the wedge between rollers 30 and 35 to effective position.

The extent of movement of the wedge in either direction and the variation in pressure between the rolls are, of course, very slight as the construction is quite sensitive and engagement of the stock with the levers is sufficient at all times to maintain the stock stretched nearly to its proper edge positions.

The adjustment of the position of the anchorage for the spring affects the extent of pull by the spring, determining the normal pressure of the movable roll against the stock and through it against the fixed roll.

The different adjustments provided permit change in the point at which the guides operate, the pressure applied, and the delicacy of operation. All of the adjustments shown are therefore useful in determining the initial setting of the mechanism or special adaptation of the mechanism to changing conditions of stock travel or to variations in the character of stock handled.

The fact that the levers are engaged by the face of the stock rather than by the edge of the stock makes this structure available for fabrics and for other forms of stock which are unusually light in weight or otherwise delicate.

In Figures 4, 5, 6 and 7 I have shown terminals for use in connection with levers such as 63, 64, the terminals shown in Figure 4 being those which are seen in Figures 1, 2 and 3.

In Figure 4 the lever 63 (and the same would be true of 64) carries a sleeve 69 which can be merely fastened upon it or adjusted and set along the length of it by a set screw 70 so as to mount an antifriction roller 71 at an angle with respect to the lever, the angle being that appropriate for engagement by the face of the stock near the edge of the stock. Obviously additional movement of the stock toward the edge will cause it to ride higher upon its roller than would otherwise be the case with additional pressure by the face of the stock upon the lever and consequent release movement of the wedge. The mount between antifriction bearings for the roller and the sleeve appears in stub shaft 72. Because the stock may ride from side to side across the junc-

tion between the sleeve and the roller 71 this junction is protected by shield 73.

In Figure 5 the sleeve 69' is mounted adjustably with respect to the length of the lever such as lever 63 and is set thereon by a set screw 70. It carries a roller 71' whose terminal 74 is bell-shaped to give the same general angular effect as is had by the angular position of the surface of roller 71. The roller is held in position upon the sleeve by a collar 75 and nut 76.

In the form shown in Figures 4 and 5 it has not been considered necessary to show anti-friction bearings which may be roller bearings or ball bearings or any other approved form adequate for the duty intended.

In the form shown in Figures 6 and 7 the sleeve 69^2, similarly held in adjusted position by set screw 70, carries a diagonal contact piece 77 at a proper angle which is finished to offer as little frictional resistance to passage of the stock as possible. The outer ends of the levers 63 and 64 should lie at an angle with the plane of the traveling stock whether special terminals be used or not. See also the bent terminal in Figure 11.

Operation of my mechanism to bring or to relieve pressure between the fixed and movable roll mechanically according to the positions of such levers as 63 and 64 may be carried out by any of a considerable variety of intermediate connections. Figures 1 and 2 show a wedge and operating levers of which levers 63 and 64 form a controlling part. Figures 8 and 9 show full lever operation, wholly mechanical and without wedge intervention. Figures 10, 10*a*, 10*b* and 11 provide feeler finger control of electromagnets which operate either to apply or to overcome spring or lever actuation.

I make no attempt to illustrate the great variety of ways in which my invention can be applied and show the diversified constructions illustrated for the purpose largely of indicating the breadth of the invention, the wedge and lever being fairly representative of distinctive types of mechanical connections and the normally closed and normally open circuit controls being sharply different.

In the construction seen in Figure 8 the lever arms 63' and 64' have stock engagement terminals integral with the arms and curved to serve the general purpose of the angularity of roller 71.

Though the effective lever arm is determined by the projected distance of the lever from the lever axis 78, the additional resilience secured, the greater convenience of attachment of the spring 38' at an intermediate position 79 thus provided and the additional leverage of the spring about the axis 78 have made it desirable to extend the lever arms 63', 64' comprising parts of the complete lever to one side of the axis then back again to the right as seen, and there to unite them with bar 80 at the end of lever section 81 pivoted about the axis 78.

The lever extends ultimately beyond axis 78 in the opposite direction to form an arm 82 within which the roller 83 is mounted. The roller 83 corresponds generally to the roller 30 which in Figures 1, 2 and 3 is mounted upon the yoke for the purpose of transmitting pressure to the movable roll in a direction across the roll. The construction of roller 83 and of its mount corresponds generally to the construction seen in Figures 1, 2 and 3, with the difference however, that the roller is now mounted upon the lever arm, instead of being mounted in the yoke. Lever arm mounting is shown in the U-shaped roller holder 32', stud 31' and nuts 84 and 85, each acting as a lock nut with respect to the other.

The spring 38' corresponds generally with the spring 38 of previous figures. The adjusting screw 50 corresponds in function generally with the adjusting screws 45 and 50 seen in Figure 1, but most resembles screw 50.

In Figures 8 and 9, as in Figures 1 to 3, the movable roll normally is pressed against the fixed roll by the operation of the spring, which spring thus becomes the measure of the pressure by which the rolls engage the traveling stock.

The arc of movement of roller 83 about axis 78 is, at the point of roller contact, nearly enough parallel to the engaged surface of the yoke to produce slight movement only of the movable roll.

In Figures 10 and 11 structures corresponding generally to Figures 1 and 8 have been adapted for electromagnetic operation. The arms, 63, 64, 63', 64', corresponding to the lever arms 63 and 64 cease to be operating arms and become feeler fingers (i. e. control arms) instead and the release or setting of the pressure exerted by the movable roll is effected by electromagnets. Whether the circuits of the electromagnets be normally closed or normally open they are governed by the feeler fingers. The control is exerted by opening or closing an electric switch within the corresponding electromagnet circuit.

It will be noted that in each of these forms a spring, corresponding in this particular to the spring 38, forms the measure of the pressure upon the stock as in Figures 1–3, 8 and 9.

Taking up first the form of Figure 10 and comparing with Figure 1, the same longitudinally movable wedge and cooperating pressure guider rolls appear and the spring 38^2 corresponds in general with the spring 38 of Figure 1.

This construction operates on a normally closed circuit, i. e. to keep the pressure on between the rolls, opening the circuit by clockwise movement of feeler finger lever 52' when movement of the line of the edge of the stock too far to the right in the figures requires release of the rolls to readjust the line position.

The wedge 34 may be set to as nearly free from operating engagement with rollers 30 and 35 as desired, when the circuit is open to cause as little or as much pressure then of the movable roll against the stock with increase of the pressure when the anchorage for this spring 38^2 is fixed by energization of the electromagnet. The difference between open and closed circuit conditions of pressure will depend upon the slope of wedge and the stroke of the electromagnets as well as upon the strength of the spring. In practical operation there is likely to be engagement for partial pressure when the circuit is open and one causing a more effective pressure when the circuit is closed.

It is desirable that the stroke of the electromagnet be very short and depending upon the slope of the wedge the stroke may be short enough so as never to release the wedge from pressure engagement between the rollers 30 and 35. It has been my purpose to provide adjustments at all points in order that the construction may be adapted to the individual use contemplated.

The feeler fingers 63' and 64' are connected with the same general type of lever 52' as is seen in lever 52 in Figure 1, but the lever arm is here pulled in a direction to press the feeler fingers

against the traveling stock by the spring 86 whose strength is adjustable by means of screw 87 fitting through the support 88 for the spring.

The arm 51' in clockwise rotation engages plunger 89 of a normally closed contact switch 90 causing movement of the plunger to the right and breaking the circuit. When the arm 51' is released the circuit is closed at the contact by means of a resetting spring, not shown, within the switch 90. The circuit is connected through a source of power 91 and conductors 92, 93 to a preferably solenoidal electromagnet 94. Alternating current electromagnets are preferred but the character of current used as well as any need for condensers connected with the contacts are not further discussed because they do not relate to the invention intended to be claimed. The electromagnet's armature plunger 95 is adjustably connected with the anchoring end of spring 38^2. The adjustment between the spring and the plunger is represented by the threading of the terminal 96 upon the plunger at 97.

A spring 98 weaker than spring 38^2 is connected with the wedge 34. The strength of this spring in a given wedge position is adjustable through screw 99 threading into a fixed support 100 and locked by nut 101.

If the wedge face be steep so that the wedge is self-releasing the spring at 98 loses one of its functions but is still effective to release the wedge more quickly than otherwise would be the case. If the wedge be a slow wedge, i. e. one of very low angle, so as not to be self-releasing, the spring 98 not only speeds up its movement but insures movement where otherwise it might be uncertain or there might be no movement.

Both the spring 38^2 and the spring 98 act in preventing jar when the solenoid core reaches the inner part of its stroke, or when electromagnetic mechanism of different character used to make the spring 38^2 effective has come "home."

The adjustments shown make it possible to position the wedge with respect to the feeler fingers and solenoid stroke, to control the stroke length and wedging force and generally to secure a much more desirable balance than would otherwise be available. The adjustment of screw 87 permits selection of just the right pressure of feeler fingers against the face of the stock.

The form shown in Figure 10*a* is comparable with that shown in Figure 10 but with the difference that the electromagnet (preferably a solenoid) normally has an open circuit and is placed at the opposite side of the wedge with respect to the spring.

The wedge 34 engages between the two rollers as before to press the yoke of the cradle and to shift the movable roll. As the circuit of the electromagnet 94' is normally open the position of the wedge is determined by the pull of spring 38^3 and its position is adjustable by tightening or loosening the screw 99'. The length of the connections between the wedge and the solenoid core is adjustable by a coupling 96' upon parts threaded at 97', 97^2, so taht when the circuit is open—normally—the wedge is set by the strength of spring 38^3 as adjusted by the screw to its left. When movement of the feeler fingers 63, 64 as in Figure 10 closes the switch to complete the circuit through the electromagnet the pull of the electromagnet releases or reduces the extent of engagement of the wedge, at the same time further stretching the spring 38^3. The spring 38^3 acts to prevent jar at the end of the movement of the solenoid core toward the right in Figure 10*a* and generally cushions movement of the parts.

Figure 10*b* follows in general the construction of Figure 10*a* but is designed to bring out the fact that a compression spring may be used instead of a tension spring. The wedge 34' need have no connection at the small end of the wedge but in that event is preferably steadied by two guide rollers 37' bearing upon a straight part 102 of the wedge. The body of the wedge shown tapers at both sides.

At the end of the wedge a collar 103 takes the thrust of a compression spring 104 which is anchored at its opposite end against a nut 105 locked by nut 106 upon a threaded tubular support 107.

The support 107 seats within the spring at one end and is threaded into a bracket 108 at the other end. A rod 109 attached to the wedge passes through the spring support end bracket and connects through a right and left coupling 96^2 (to make the length adjustable) with the armature of an electromagnet whose circuit may be controlled by feeler-finger switch mechanism paralleling Figure 10. Preferably the electromagnet circuit is normally open.

The Figure 10 and Figure 11 constructions would operate upon normally open electromagnet circuits and the Figure 10*a* and Figure 10*b* constructions would work on normally closed electromagnet circuits, but not so well in any of these cases as with normally closed circuits in Figures 10 and 11 and normally open circuits in Figures 10*a* and 10*b*.

In Figure 11 the construction follows in part the construction of Figure 8. The roller 83 is applied to press the movable roll toward the fixed roll and to grip the stock between the rolls by reason of counterclockwise movement of the lever 110. When the electromagnet (preferably solenoid) 94^2 is energized—and it is normally energized—the spring 38^4 is rendered effective to pull the lever 110 in counterclockwise direction and this pull is maintained through the spring 38^4, making use of the resilience of spring 38^4 both to damp the movement of the solenoid core into the solenoid and to bring resilient pull upon the lever so as to push roller 83 against the carrier cradle of the movable roll. Adjustments of the position of the roller 83 and of the normal projection of the solenoid core from the solenoid appear in the threading of the stud 31' into the lever and in the threaded connection between plunger 97 and plunger terminal 96.

Feeler finger levers 63^2, 64^2 operate about axis 111 against tension of spring 86 to shift a switch plunger 89' within normally open electromagnet switch 90' so as to close, and by release open circuit 92, 93 through the electromagnet 94^2. The source of current is typified as battery 91.

In the form shown in Figures 1–3, normally the spring 38 draws the wedge between the rollers 30 and 35 until the tension of the spring is balanced against the pressure exerted upon the stock by the movable roll. When the stock rides too far to the left (outside) the pressure of the face of the stock against the levers 63 and 64 causes the wedge to be withdrawn in part against the spring tension reducing the pressure of the movable roll against the stock until the stock edge moves to the right, releasing pressure upon the levers.

In operation in the form of Figure 8, the mechanical operating lever is pulled resiliently by its spring so as to bring pressure upon the cradle carrying the movable roll. The pull of

the spring also presses the lever arms **63'**, **64'** against the face of the moving stock.

The lever arms **63'** and **64'** are engaged by the face of the stock at pressures differing according to the lateral position of the edge of the stock. With movement of the stock so that its edge recedes from the left of Figure 8 the lever arms swing in a counterclockwise direction to allow additional pressure upon the cradle yoke causing a greater pressure between the fixed and movable rolls against the stock between them and resulting in the traveling stock being pulled to the left in that figure.

When the stock moves too far to the left it engages the curved terminals of the lever arms **63'**, **64'** swinging these lever arms in clockwise direction against the force of the spring, causing slight release of the pressure against the yoke of the cradle and resulting in movement of the stock to the right in Figure 8. As in the case of Figures 1, 2 and 3 the action is purely mechanical and the device may be made so sensitive that very slight shifts in the position of the edge of the stock set the correcting mechanism in motion. As a result great accuracy can be secured with resultant minimal variation of the position of the edge of the stock.

In the operation of the electrical form in Figure 10 the electric circuit for the solenoid is normally closed with the result that the solenoid armature **95** is pulled to the left in Figure 10 stretching the adjacent spring and making this spring effective to pull the wedge between the rollers **30** and **35**. The yoke of the cradle will thus force the movable roll toward the fixed roll and against the traveling stock between, with any desired pressure determined by the various adjustments provided for, the strengths of the springs within the ranges of spring extension used and by the relative positions of the parts.

When the travel of the stock too far to the left in Figure 10 shifts the levers (now feeler fingers) about their axis in clockwise direction against their retracting spring, the circuit through the solenoid is interrupted with the result that the operating wedge spring is no longer stretched to the same extent but is slack or is relatively slackened and the wedge is free to release from between the rollers **30** and **35**.

The second spring, connected with the base of the wedge pulls the wedge back or hastens movement of the wedge, as the case may be, depending upon the extent of slope of the wedge.

The effective strength of the wedge spring to press the wedge between rollers **30** and **35** is the difference between the strengths of the wedge spring and the release spring. In order properly to position the wedge when the contact is closed and also to select the limits of spring extension at which it is desired to operate this structure is shown as adjustable at both ends of the wedge.

The effect of release of the electromagnet anchorage of the wedge spring depends upon a number of factors, including particularly the length of stroke of the electromagnet's armature, the extent of slope of the wedge, whether the wedge is wholly to release or only slack somewhat and the range of wedge movement between effective release of the movable roll and sufficient tightening of the roll to cause the stock to be drawn toward the left in Figure 10. I contemplate short wedge movements, permissibly of the order of one-sixteenth to one-eighth of an inch.

In Figures 10*a* and 10*b* a single spring only is used and the electromagnet (here again preferably solenoidal) circuit is normally open. The rest of the structure may follow for example, that of my Figure 10. The single spring serves several purposes and renders the use of a second spring unnecessary. This particularly is true because it not only acts as a protection to the electromagnet armature and permits this armature to be given full stroke but it gives an initial set to the wedge. Because the pull upon the wedge is dependent upon the spring, and a spring of proper resilience can be selected, any desired pressure of the movable roll against the stock may be secured just as is the case in the form of Figures 1–3.

As in Figures 1–3 the strength of the spring is adjustable by the adjustable anchorage of the spring. The connection of the wedge with the electromagnet plunger is also made adjustable so that it is possible not only to determine the effective strength of the spring by varying the initial extension of the spring and thus controlling the strength within the range of spring extension which is to be used, but also to vary the position of the wedge with respect to the wedge engagement by which it is to be applied to the cradle carrying the movable roll.

With the further capability of control of the effect of any given wedge movement by determining the slope of the wedge and of being able to control the total wedge movement by the range of electromagnet armature throw it is possible to operate at much more nearly the roll pressure requisite for maintaining the stretch of the stock—cloth or other fabric for example, required than would be possible with the mechanical retraction of the wedge. This is due in large measure to the more rapid response of the electromagnet to delicate feeler finger switch control than can be secured where the work of wedge withdrawal must be performed by actual pressure of the stock.

In the form shown in Figure 11 the operating spring is anchored electromagnetically as in Figure 10, the anchorage making the setting spring effective to apply pressure through the movable roll. The circuit normally is closed giving the spring anchorage by the pull of the armature, and the spring is released with corresponding release of the pressure by opening the circuit through feeler finger switch operation.

Through a coupling the position of the wedge when the circuit is closed is made adjustable, and closing the circuit causes release of the wedge against the strength of spring. The feeler fingers are spring retracted and adjustment of the strength of the retraction spring may be the same as in Figure 10. Clockwise movement of the feeler finger arm causes interruption of the circuit and hence permits spring setting of the wedge whereas counterclockwise movement of the feeler finger causes the circuit to close and releases or partly releases the wedge, according to the proportioning and setting of the parts.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain part or all of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

Having thus described my invention what I

claim as new and desire to secure by Letters Patent is:

1. In a guiding device for traveling stock, a support, bodily fixed and bodily movable rotatable rolls, a cradle pivoted on the support and carrying the movable roll, a wedge and connections cooperatively adapted to apply pressure to the cradle through the wedge, spring means for positioning the wedge to apply such pressure and lever means for shifting the wedge terminating in an operating arm engaged by the face of the traveling stock and movable toward and away from the plane of the face of the stock.

2. In a guider for traveling flat material, a pair of guider rolls, one fixed, the other movable, a support for the rolls, a mount for the movable roll, a roller connected with the mount, a fixedly supported roller opposite the first roller forming a path between them, a wedge movable in said path and engaging both rollers, a spring pulling the wedge between the rollers, a lever and connections from one of the arms to the wedge for release of said wedge and an operating arm forming part of said lever and engaged by the face of the traveling stock near its edge to release the wedge.

3. In a guider for traveling flat material, a pair of guider rolls, one fixed, the other movable, a support for the rolls, a mount for the movable roll, a roller connected with the mount, a fixedly supported roller opposite the first roller forming a path between them, a wedge movable in said path and engaging both rollers, a spring pulling the wedge between the rollers, an adjustment for the spring, a lever and connections from one of the arms to the wedge for release of said wedge, an adjustment in said connections and an operating arm forming part of said lever and engaged by the face of the traveling stock near its edge to release the wedge.

4. In a mechanical guider, a pair of guider rolls one of which is movable, a cradle for the movable roll, wedge connections with the cradle for swinging the cradle, a spring holding the wedge normally in operating position to press the movable roll against its mate, an adjustable anchorage for the spring, a stock-operated lever engaging the wedge to pull it against the spring and an adjustment in the position of the lever with respect to the stock.

5. In a guider for traveling stock, a support, bodily fixed and bodily movable rotatable rolls mounted in the support, spring-operating-wedge means for moving the movable roll, means for releasing the wedge operated by traveling stock engagement and roller means for relieving the friction of the traveling stock with the releasing means.

6. In a guider for traveling stock, a support, bodily fixed and bodily movable rotatable rolls mounted in the support, a swinging cradle carrying the movable roll, spring-set wedge and lever means for normally holding the rolls pressed toward each other and releasing the rolls with traveling stock engagement and a terminal for said lever engaged by the traveling stock and having a roller upon said lever forming the surface engaged by the stock.

7. In a guider for traveling stock, a support, bodily fixed and bodily movable rotatable rolls mounted in the support, a swinging cradle carrying the movable roll, spring-operated wedge means for tilting the cradle, lever means for releasing the wedge operated by traveling stock engagement and swinging toward and away from the plane of the stock, means for varying the action of the spring to vary the sensitiveness of wedge release and separate means for altering the point at which the wedge release becomes effective by engagement of the traveling stock so as to alter the amount of side stretch given to the traveling stock.

8. In a guider, a pair of guider rolls, one of which is bodily movable, a movable support for the movable roll, a wedge and an abutment adapting the wedge to shift the movable roll when the wedge is operated, a spring engaging the wedge and tending to tighten the wedge and electromagnetic means for pulling on the spring to tighten the wedge.

9. In a guider, a pair of guider rolls, one of which is bodily movable, a movable support for the movable roll, a wedge and an abutment adapting the wedge to shift the movable roll when the wedge is operated, a spring engaging the wedge and tending to tighten the wedge and electromagnetic means acting to furnish an anchorage for the spring to make it effective to tighten the wedge.

10. In a guider, a pair of guider rolls, one of which is bodily movable, a movable support for the movable roll, a wedge and an abutment adapting the wedge to shift the movable roll when the wedge is operated, a spring engaging the wedge at the small end and tending to tighten the wedge, electromagnetic means for pulling on the spring to tighten the wedge, the circuit of the electromagnet being normally closed and stock-operated-feeler-finger switch means for interrupting the circuit when excessive lateral movement of the stock toward its edge takes place.

11. In a guider, a pair of guider rolls, one of which is bodily movable, a movable support for the movable roll, a wedge and an abutment adapting the wedge to shift the movable roll when the wedge is operated, a spring engaging the wedge at its small end and tending to tighten the wedge, electromagnetic means for anchoring the spring to make it effective and stock-operated means for controlling the circuit of the electromagnet.

12. In a guider, a pair of guider rolls one of which is bodily movable, a movable support for the movable roll, a wedge and an abutment adapting the wedge to shift the movable roll when the wedge is operated, a spring engaging the wedge at the small end and tending to tighten the wedge, electromagnetic means for anchoring the spring to make it effective, stock-operated means for controlling the circuit of the electromagnet and an adjustment between the electromagnet and the spring whereby the range of the spring operation can be altered by said adjustment.

13. In a guider, a pair of guider rolls, one of which is bodily movable, a movable support for the movable roll, a wedge and abutment adapting the wedge to shift the movable roll, a spring engaging the small end of the wedge and tending to tighten the wedge, electromagnetic means for anchoring the spring to make it effective, a second spring at the opposite end of the wedge, lighter in effect than the first spring adapted to release the wedge when the first spring is not operating and an anchorage for the second spring and stock-operated means for controlling the circuit of the electromagnet.

14. In a guider, a pair of guider rolls, one of which is bodily movable, a movable support for

the movable roll, a wedge and abutment adapting the wedge to shift the movable roll when the wedge is operated, a spring engaging the wedge and tending to tighten the wedge, a second spring at the opposite end of the wedge, lighter in effect than the first spring adapted to release the wedge when the first spring is not operating, an anchorage for the second spring and an adjustment for the position of the anchorage, electromagnetic means for anchoring the spring to make it effective and stock-operated means for controlling the circuit of the electromagnet.

15. In a guider, a pair of guider rolls, one of which is movable, a mount for the movable roll, wedge connections with the mount whereby the movable roll is tightened against or slackened from the other roll, a pair of springs one at each end of the wedge, of different strengths, the stronger spring tending to tighten the wedge, anchorages for the two springs, electromagnetic means for fixing or releasing the anchorage of the stronger spring, stock-operated-means for closing and opening the circuit of the electromagnet and an adjustment for the strength of one of the springs.

16. In a guider, a pair of guider rolls, one of which is movable, a mount for the movable roll, wedge connections with the mount whereby the movable roll is tightened against or allowed to slacken from the other roll, a pair of springs, one at each end of the wedge, of different strengths, the stronger spring tending to tighten the wedge, anchorages for the two springs, electromagnetic means for fixing or releasing the anchorage of the stronger spring, stock-operated-means for closing and opening the circuit of the electromagnet and adjustments for the strengths of both springs.

17. In a guider for traveling stock, fixed and movable guider rolls, a support for the movable roll, a wedge adapted to tighten the movable roll against the fixed roll, an abutment, a spring between the abutment and the wedge tending to tighten the wedge, an electromagnet connected with the wedge, tending to release the wedge by moving it against the force of the spring and stock-operated means for controlling the electromagnet circuit.

18. In a guider for traveling stock, fixed and movable guider rolls, a support for the movable roll, a wedge adapted to tighten the movable roll against the fixed roll, an abutment, a spring between the abutment and the wedge tending to tighten the wedge, an electromagnet connected with the wedge tending to release the wedge by moving it against the spring, an adjustment in the connections between the electromagnet and the wedge and stock-operated means for controlling the electromagnet circuit, the circuit normally being open.

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