

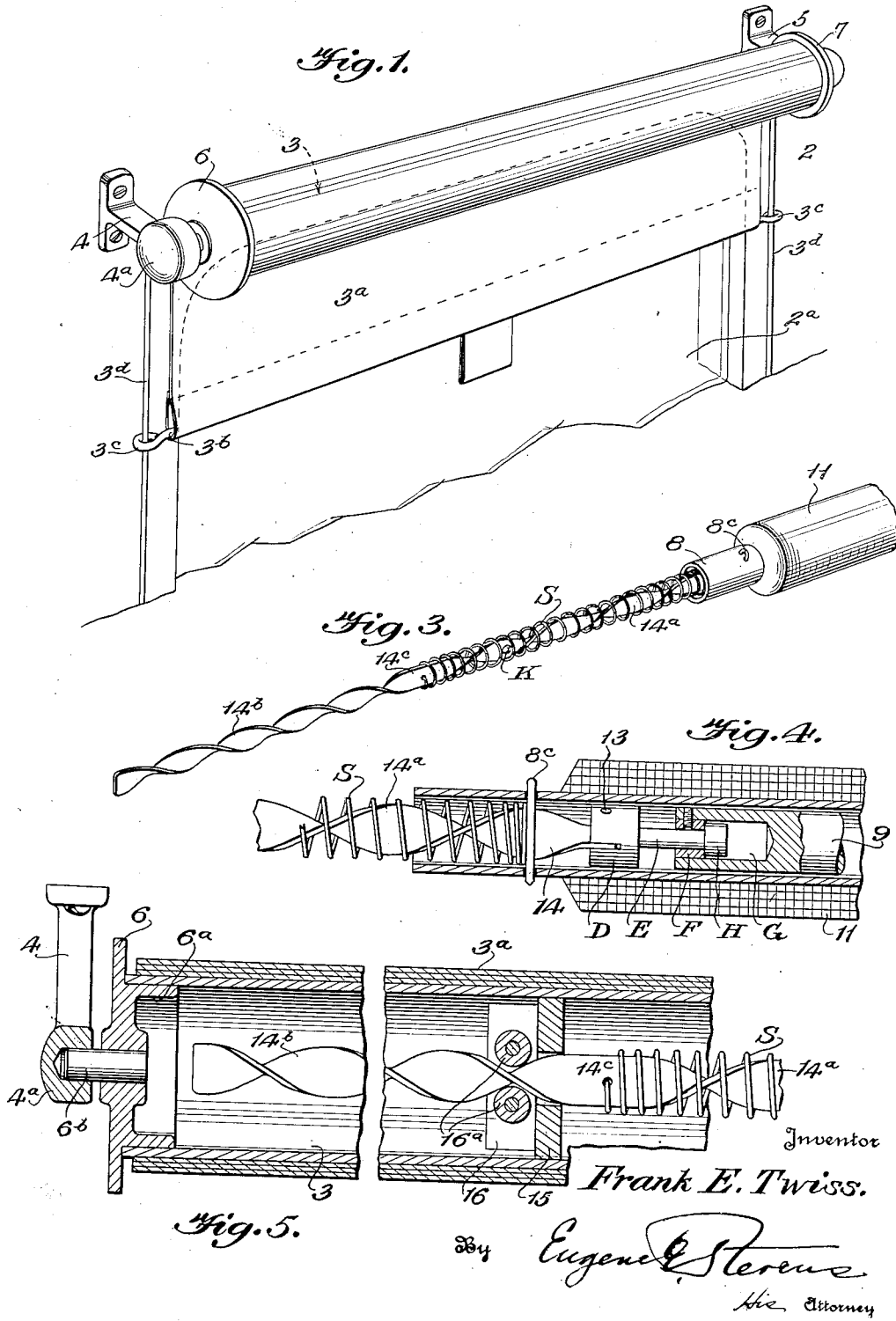
Sept. 29, 1936.

F. E. TWISS

2,055,511

ROLLER CURTAIN AND OPERATING MEANS THEREFOR

Original Filed July 24, 1931 3 Sheets-Sheet 1



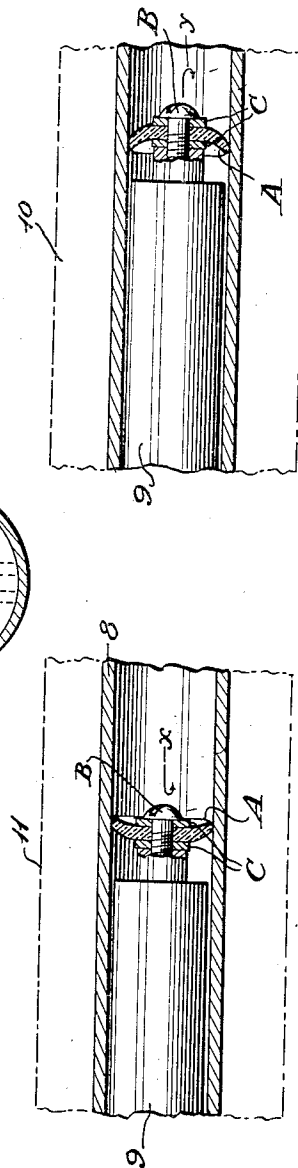
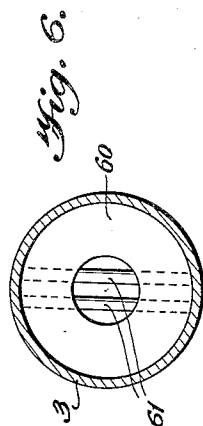
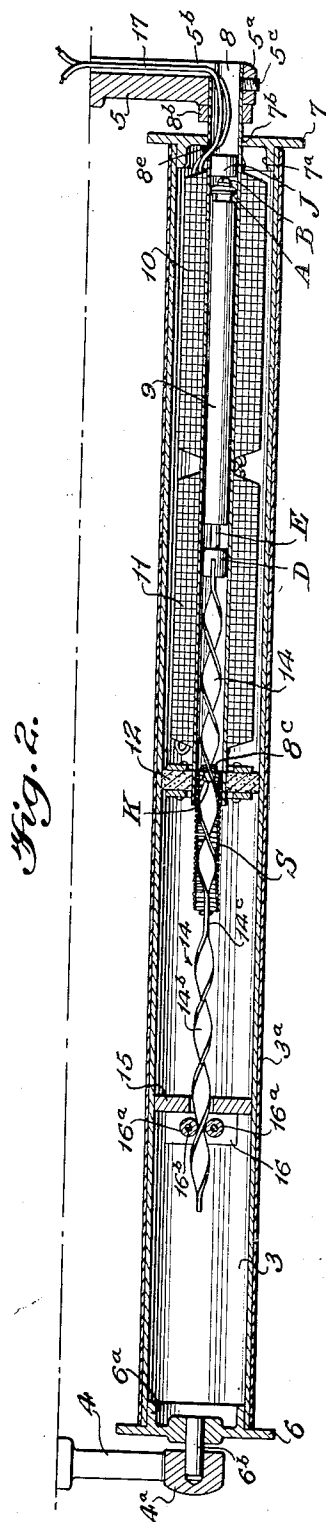
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2,055,511

ROLLER CURTAIN AND OPERATING MEANS THEREFOR

Original Filed July 24, 1931 3 Sheets-Sheet 2



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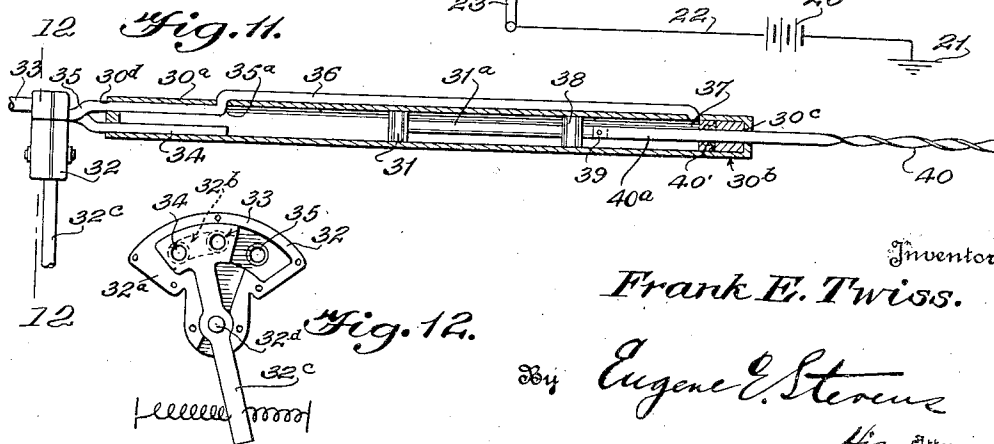
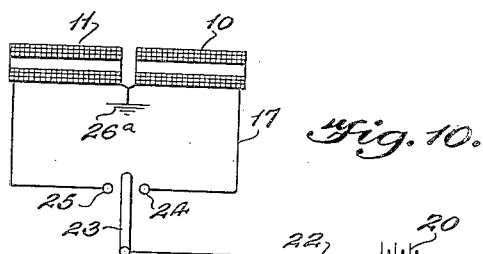
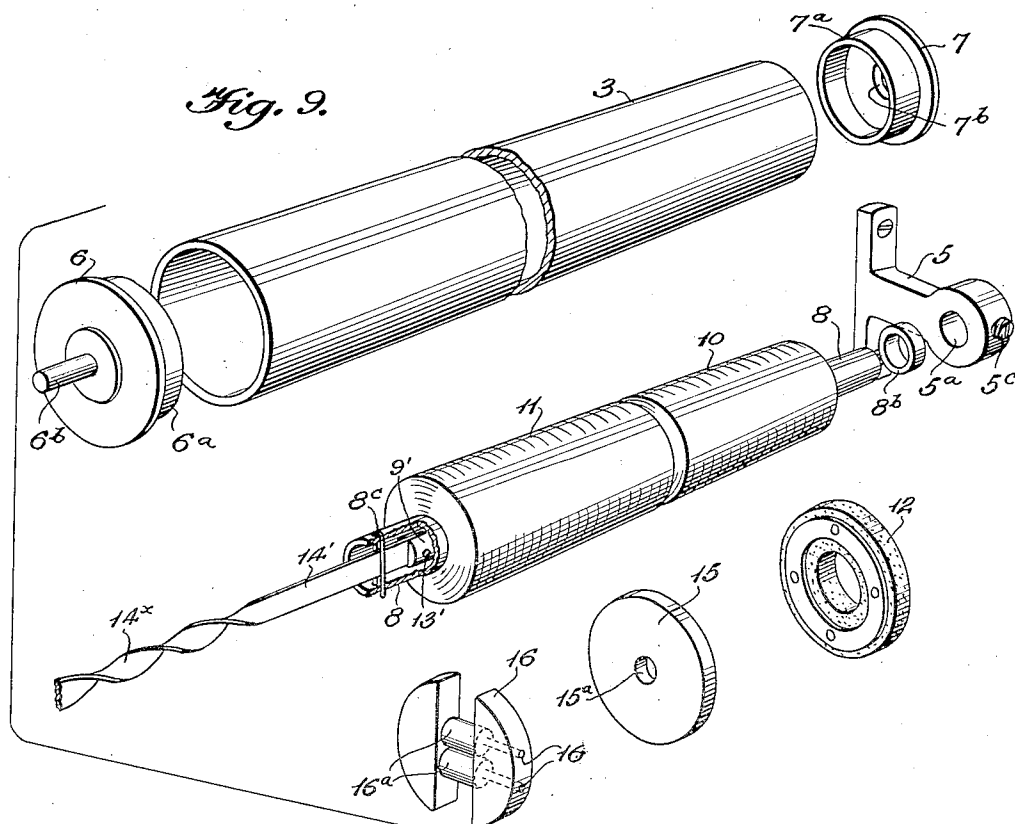
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F. E. TWISS

2,055,511

ROLLER CURTAIN AND OPERATING MEANS THEREFOR

Original Filed July 24, 1931 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,055,511

ROLLER CURTAIN AND OPERATING
MEANS THEREFOR

Frank E. Twiss, Taunton, Mass.

Application July 24, 1931, Serial No. 552,961
Renewed December 18, 1935

49 Claims. (Cl. 156—28)

My invention relates to improvements in roller curtain structures, with particular reference to such as are used for the windows of closed automobiles,—although it is to be understood, of course, that the invention in its broadest aspects is susceptible of many applications. The present invention is an improvement upon the construction of my co-pending application Serial No. 527,553, filed April 3, 1931.

10 Briefly stated, the invention has for its primary object to provide a device of the character specified which will be mechanically operable, and wherein the operating mechanism will be of very simple and positively acting construction,—un-
15 likely to get out of order, and entirely concealed within the curtain roll itself, so as not to detract from the appearance of the car, and further so that the working parts will be protected from dust, etc.

20 Other objects of this invention, (and by way of improvement over the structure disclosed in my said prior application) are to provide, in a device of this kind, a stabilizing or counterbalancing means for balancing the weight of the
25 wholly or partially unrolled curtain so as to lighten the load upon the source of power, also the provision of brake means for initially resisting the winding or unwinding movement of the roll,—there preferably being a lost motion connection between elements of the roll-actuating
30 means so that the latter will not be working against the load of the curtain roll while overcoming the initially acting brake means.

35 The invention also contemplates a mechanically operable roller curtain or the like, which is adapted to be readily installed in a motor vehicle without the exercise of any particular skill or special training,—the matter of installation being one that can be taken care of by the ordi-
40 nary mechanic.

Still another object of the invention is to provide a roller curtain structure wherein the roller comprehends a rotatably supported sleeve providing a self-contained operating means which
45 includes a driven spiral element, operatively engaged with the sleeve for rotating the same.

A further and more specific object of the invention is to furnish a roller curtain having contained within the roller electro-magnetic means for operating the roller,—which means provides
50 a portion serving as a bearing for supporting the roller.

Still another object of the invention is to provide a device of this kind wherein the roller has
55 self-contained electro-magnetic means, prefer-

ably of the solenoid type, and which includes two aligned and independent coils selectively operable to actuate a core in opposite directions,—the core having a spiral extension operatively connected with the roll, and the supporting means for the coils and plunger serving as the axis or bearing support upon which the roller is journaled.

The invention also resides in certain novel features of construction, combination and arrangement of the various parts, and in certain modes of operation and methods of use as will be readily apparent to those skilled in the art upon reference to the accompanying drawings in connection with the detailed descriptive matter appearing hereinafter.

In the drawings,

Figure 1 is a perspective view illustrating the application of one form of my roller curtain to the rear body wall of a sedan type automobile;

Figure 2 is a longitudinal sectional view illustrating one form of the invention and showing an actuating strip twisted to provide right and left hand spiral flights;

Figure 3 is a fragmentary perspective view of a portion of the roll-actuating means of Figure 2;

Figure 4 is an enlarged sectional detail view illustrating the counterbalance or stabilizing spring and the lost motion connection between the spiral strip and plunger;

Figure 5 is a fragmentary lineal sectional view through the curtain roll;

Figure 6 is a cross-sectional view through the roller and showing a modified form of slot-providing partition for the roll to be engaged by the spiral actuating strip;

Figure 7 is a lineal and fragmentary sectional view through the mounting tube of the roll and solenoids,—and showing the novel braking element of the solenoid core in the position it assumes when the curtain is being rolled up,—or has been fully rolled up;

Figure 8 is a view similar to Figure 7, but showing the brake element in the position it assumes when the curtain is being, or has been, fully lowered;

Figure 9 is a group perspective view illustrating a modified form of actuating strip having a single spiral flight instead of two; also certain parts of the device as shown in Figures 1 and 2;

Figure 10 is a wiring diagram;

Figure 11 is a longitudinal sectional view through a pneumatically operable actuating unit for the roller; and

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Figure 12 is a sectional view taken on the line 12—12 of Figure 11.

- Referring specifically to the drawings wherein the same reference characters have been used to designate the same parts in all views,—numeral 2 indicates the rear wall of a closed car having the usual window 2^a which is adapted to be covered by the curtain 3^a secured to the sleeve type roll 3.
- 10 Brackets 4, 5 are mounted as usual upon the rear wall 2 of the body for the purpose of supporting the curtain structure,—there being novel bearing means for the roll 3 to which reference will now be made.
- 15 As stated, the roll 3 is a sleeve and the curtain 3^a is adhesively secured thereto, or in any preferred manner. A cap 6 provides a flange 6^a insertable into one end of the tube 3 with a tight friction fit. Such cap 6 provides the concentric, exterior pintle 6^b which is rotatable in the bearing 4^a of the bracket 4 to support, or cooperate in supporting, one end of the roll 3,—although in the last analysis (as will be understood later) the bracket 4 and its bearing 4^a has for its chief
- 20 function to limit axial movement of the roll 3 theretoward.

- The other end of the roll 3 is adapted to be closed by a cap 7 whose flange 7^a is insertable into the roll,—but which cap in lieu of a pintle
- 30 is provided with a relatively large, concentric hole 7^b for receiving the adjacent end of a tubular member 8.

- The tubular member 8, as will be evident from Figure 2, provides a bearing support for cap 7 and the adjacent end of roll 3 with which the cap is frictionally engaged as mentioned in the case of cap 6.

- Figure 2 clearly illustrates that the tube 7 also serves to support and guide the solenoid core 9 in addition to supporting the oppositely wound and lineally spaced solenoids 10, 11. Besides this, the inner end of this multi-function tube 8 serves to rotatably support the intermediate portion of the roller 3 through the partition bearing 12 (Figure 2) which is secured to the roller. This partition bearing 12 is shown in detail in Figure 9, and is simply frictionally held therein, but may be otherwise held.

- Figure 2 also depicts the curtain roll 3 as having a second fixed partition 16 (shown in detail Figure 9) providing closely spaced parallel rollers 16^a which define a bearing slot for receiving the spirally twisted forward end portion 14^b of an actuating strip 14 controlled by the reciprocation
- 50 of the solenoid core 9. This partition 16 may be backed by a partition disk 15 having a medial circular hole 15^a (Figure 9) through which the strip 14 rotatably extends.

- The rear end portion 14^a of strip 14 is spirally twisted in the opposite direction from that of the portion 14^b, and passes through the slot provided by the legs of a staple 8^c carried by the tube 8 and extending transversely thereinto.

- It will be clear from Figures 2 and 3 that when the solenoid core 9 moves to the left (Figure 2), the outward thrusting of the strip 14 will be accompanied by a clockwise movement (see Figure 3) by reason of the engagement "left hand" spiral twists or flight 14^a with the legs of staple 8^c.

- Obviously, when the strip 14 is rotated, as aforesaid,—the mere engagement of a plane outer strip portion in the roller-defined bearing slot of the curtain roll partition 16 would effect a corresponding clockwise movement of the roll
- 75 3 to wind the curtain thereon. However, upon

the out-thrust of strip 14 from tube 8 the "right hand" twist or flight 14^b, through its working engagement with the slot-defining rollers 16^a of partition 16,—substantially doubles the clockwise rotational speed of the curtain roll 3.

When the solenoid core 9 is drawn inwardly, or to the right (Figure 2), the roll 3 will be driven at a correspondingly accelerated speed in a counter-clockwise direction (Figure 1) to unwind the curtain 3^a therefrom.

Figure 9 shows a modified form of an actuating strip as at 14' having but a single spiral flight 14^x and having a plane rear portion connected as at 13' to the solenoid core 9'. The plane rear end of strip 14' works through the staple 8^c as before and flight 14^x works through the roller-defined slot of partition 16.

The rollers 16^a obviously facilitate the reciprocation of the plunger 9 and its connected strip member 14, and assure a free and rapid response of curtain roll 3 to the movements of the common solenoid core 9. The use of a spiral strip such as 14^b is very advantageous because inasmuch as its entire width may be used for drivingly engaging the roll, there is less tendency to bind than would otherwise be true.

As indicated, the invention comprehends means for counterbalancing the weight of the curtain 3^a when wholly or partially unrolled. The now preferred form of this counterbalance is a coil spring S (see Figs. 2, 3, 4, and 5) having one end anchored to the intermediate plane portion 14^c of the double twisted spiral strip 14, while the other end is adapted to extend into the tubular member 8 and bear against the staple 8^c (Fig. 4). When the curtain 3^a is being unrolled the solenoid core and spiral strip 14 will be urged or actuated inwardly so as to compress the spring between points 14^c and 8^c as shown in Fig. 2.

On the other hand when the curtain is being rolled up the spring S will act in a direction to assist the rolling up of the curtain and will, in effect, substantially balance the weight of the curtain so that the source of power,—namely the solenoids,—will be subjected only to the resistance of the roller and will not have the added weight of the curtain. By the same token, when the curtain is being unrolled the spring S substantially counterbalances the weight of the curtain 3^a, as previously intimated.

The spring S therefore assures ease and smoothness of operation of the roll, its effective power being at all times substantially proportionate to the amount of curtain 3^a that is unrolled. The power of the spring must never be sufficient to lift the curtain. Of course, the spring can be omitted, if desired.

It has been found in practice that the vibration of the car in transit tends to affect the position of the curtain 3^a. For instance, if the curtain is down there is apt to be a tendency for it to roll up slightly,—while the reverse is true when the curtain is rolled up. Now in order to meet this situation, I provide the inner end of the solenoid core 9 with a novel brake element,—preferably in the form of a rubber, or other resilient gasket or washer, which is (shown in Figs. 2, 7 and 8) designated as at A, and secured in place by a screw B,—there being small wear gaskets C at either side of the washer A.

It is believed to be obvious that when the solenoid core 9 is moved inwardly,—or toward the right in Figure 2 to lower curtain 3^a,—the frictional engagement of the washer A with the tube 8 will cause the washer to flex toward the left

as indicated in Figure 8. Manifestly, the washer A when disposed as in Figure 8 will yieldingly resist retraction of the core 9 toward the left to actuate roll 3 to raise the curtain 3^a.

However, a slight leftward movement of core 9 will overcome the resistance of washer A (Figure 8) and will flex it toward the right (Figure 7). The arrows X, Y in Figures 7 and 8 (respectively) indicate the direction of solenoid core movement which the washer A resists. By reason of its thin body and flexible resilient nature it will be readily understood that once the washer A has been unseated from either of its holding positions it will admit of free movement of the core 9 to raise or lower the curtain.

In order that the solenoid core 9 shall not be loaded simultaneously with the load of the curtain roll and the seating resistance of the washer A (Figures 7 and 8), I connect the twisted actuator strip 14 to a relatively slidable and rotatable extension D of the solenoid core 9. This extension or block element D (Figures 2 and 4) has a stem E extending into the bore G of core 9 which bore is provided, at its outer end, with a bearing bushing F for said stem E. Outward movement of the block D from bore G is limited by the engagement of the stem enlargement or head H with the bushing F.

It will be apparent that when the core 9 is moved to the right (Figures 2 and 4) to lower the curtain, the solenoid extension D will be dragged or pulled along through the engagement of the stem head H with the bushing F. Thus, when rightward movement stops there will be a space between block D and the end of core 9. Therefore, it will be clear that when core 9 is actuated in the opposite direction (left) the spiral strip 14 will not be moved until the end of the solenoid core 9 engages the extension or block D. During this brief interval of movement, the flexible washer A will be unseated from its locking or holding position (Figure 8), and flexed to the position of Figure 7 so as not to resist travel of the solenoid core in the leftward direction to raise the curtain 3^a. This follows from the fact that the core 9 will be in engagement with the block D when rightward movement begins but the block will not be moved to actuate the spiral strip 14 until the stem head H engages bushing F.

The flexible washer has been found to be very efficient in practical use and will, when in the positions shown in Figures 7 and 8, offer sufficient resistance to axial movement of the plunger, in the directions indicated by X and Y, respectively, to effectively prevent movement of the curtain, except through energization of one or the other of the solenoids 10, 11.

It has been found in practice that when the curtain 3^a is being lowered through rightward movement (Figure 2) of the solenoid core 9 that the block D tends,—due to the weight of the curtain and the impetus of its downward travel,—to ride inwardly slightly toward bushing F (Figure 4), after the end screw B (Figures 2, 7 and 8) of the solenoid has engaged the fixed stop J in tube 8. Of course, the spring S quickly draws the block D away from the core 9 again but frequently with enough of a backlash or snap to unseat the brake element or washer from its holding position depicted in Figures 2 and 8.

In order to overcome this backslashing of block D,—I provide the spiral flight 14^a of strip 14 with a stop element K which, as shown in Figure 2, is so positioned as to come into contact

with the legs of the staple 8^c at the instant the screw extension B of the core 9 engages the tube stop J. This means, of course, that core 9 and block D will be stopped simultaneously and the objectional relative movement of block D toward the adjacent end of core 9 prevented when the curtain reaches lowered position,—and this without interfering with the novel free initial leftward movement of the core toward the block D to unseat the brake or washer A from the position of Figure 8 preparatory to the actuation of strip 14 to raise the curtain.

As shown in the wiring diagram (Figure 10), the solenoid coils 10, 11 are each grounded on the tube 8 which, in turn, is grounded 26^a to the chassis frame of the car. Coils 10, 11 are supplied through the current-carrying wires 17 leading from the respective switch contacts 24, 25, which are selectively engageable by the movable switch arm 23, having the connection 22 with one side of the battery 20 whose other side is grounded as at 21 on the car chassis. These wires 17 and the tube ground wire 26^a are led in through the outer groove 5^b of the bracket 5 and into the rear end of the tube 8, (see Figure 2) and then outwardly through a hole 8^c to the solenoid coils 10, 11.

The tube 8, also has a collar 8^b, as shown, serving as a stop for limiting movement of the cap 7 in the direction of the adjacent bracket 5. The tube 8 will be adapted to be rigidly held against rotation in the bearing portion 5^a of the bracket 5 by means of a set screw 5^c. There will be times when it will be desirable to have the tube 8 rotate within the bearing 5^a of the bracket 5, as will be presently apparent.

The operation of the device is very simple, and also the installation of the same. The two wires 17 and tube ground wire 26^a are led out through the groove 5^b (Figure 2) in the bracket 5, and will be passed in rear of the upholstery or lining of the car. Wires 17 will be connected to the switch member contacts 25, 24 (Figure 10) adjacent the driver's seat, while wire 26^a will be grounded on the chassis, as aforesaid.

In lieu of the slot-providing partition 15, 16 I may employ the partition 60 of Figure 6 having the medial hole which is spanned by the adjacent rods or pins 61.

A mere touch of the switch member 23 to one or the other of the contacts 24, 25 will serve to actuate the curtain roll the desired distance. Manifestly, switch 23, 24, 25 may take any preferred or desired form, and, per se, forms no part of this invention.

The conventional curtain is provided with the reinforcing strip 3^b in its looped lower edge and this provides guide eyes 3^c engaging the guide wires 3^d, which may be carried by the brackets 4, 5 at one end and secured in the usual fashion to the rear wall 2 of the car at the other end.

The preferred mode of installing the device in the car will be as follows. The curtain roller will be stood on either end and the tube 8 will be firmly held against rotation. The roller will be rotated to either the right or left to bring the plunger or core 9 to the extreme leftward or projected position, which it will occupy when the curtain is rolled up.

This having been done, the curtain is attached to the roller and the bracket secured to the wall. The set screw 5^c is loosened and the roller and tube 8 are turned until the curtain is rolled up. Then the wires 17, 17 and 26^a, which have been merely extending out through the end of tube

8 during the adjustment, are bent down in the bracket slot 5^b and carried back of the upholstery, as mentioned.

Figures 11 and 12 illustrate a pneumatically operated control unit for the roll 3 of Figure 1,—the brackets and roll being deleted for the sake of clarity.

Here, the opposite ends of tube 30 provide spaced bearings 30^a, 30^b for the tube end cap 7, and intermediate partition 12 (Figures 2 and 9). This tube is closed at each end as at 30^c, 30^d to provide a piston chamber for the reciprocatory piston 31 having the stem 31^a to which is connected (39) the plane faced end portion 40^a of a strip, whose outer end is spirally twisted as at 40. The spirally twisted strip end portion 40 is adapted to pass between the slot-providing rollers 16^a to actuate the curtain roll as mentioned in connection with strip 14. The plane-sided strip portion 40^a works through the packing gland slot 40^b.

The casing 32 of a two way valve receives compressed air or fluid from the pipe 33, and the manually swingable valve 32^a provides the by-pass 32^b which is operable to selectively establish communication between the inlet pipe 33 and one or the other of the outlet pipes 34, 35 leading into casing 32.

Valve 32^a may be operated by handle 32^c,—and in the position shown in Figure 12 the fluid will be directed through the outlet pipe 34 against the adjacent side of the piston 31. When the by-pass 32^b registers with inlet pipe 33 and outlet pipe 35 the fluid will be passed through such outlet pipe 35 and its offset portion 36 to the opposite side of the piston 31 through the inlet hole 37 of the piston chamber which is located adjacent the packing gland 40^b.

The supply of fluid through outlet pipe 35, 36, 37 forces the piston 31 to the left as viewed in Figure 11,—the end of pipe 34 and the shoulder 35^a provided by the offset portion 36 of pipe 35 serving as a stop to limit leftward movement of the piston.

When the fluid is supplied through pipe 34, the guide partition 38 through which the piston stem 31^a extends serves to limit rightward movement of the piston 31 as indicated in Figure 11.

The valve casing 32 will be located at any preferred point for convenient operation and the tubing passed back of the upholstery. The form of invention shown in Figures 11 and 12 has been described as pressure operated but obviously vacuum operation is the full equivalent and in many instances will be preferred over pressure. The curtain could be operated in the same fashion as a wind shield wiper from the intake manifold-created vacuum.

A coil spring 50, secured intermediate its ends to the handle 32^c and at its ends to suitable fixed elements, serves to yieldably hold the valve 32^a in its central position to cover only the inlet opening 33. Thus the fluid will be supplied to passages 34, 35 only upon manual operation of the handle.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of a curtain comprising a roll, self-contained reciprocatory driving means within the roll and operatively connected therewith, a single lineally extending shaft constituting the sole support for said driving means and extending substantially throughout the length of the same, and bearing portions carried by said

roll and journaled upon said driving means support, said bearing portions being independent of the connection between said driving means and roll.

2. The combination of a curtain roll, a self-contained driving means within the roll, said driving means including a spiral strip operatively engaged with the roll, a support for said driving means and providing a controlling guide for said strip for lineal movement, and bearing portions carried by said roll and journaled upon said driving means support, one of said bearing portions being between the ends of the roll.

3. The combination of a curtain roll, a self-contained driving means within the roll, said driving means including a spiral strip lineally operable and having an operative anti-friction engagement with the roll, a support for said driving means and providing a controlling guide for said strip for lineal movement, and spaced bearing portions carried by said roll and journaled upon said driving means support.

4. In a curtain roll, a self-contained driving means within the roll, said driving means including a spiral strip operatively engaged with the roll, a support for said driving means and providing a controlling guide for said strip for lineal movement, bearing portions carried by said roll and journaled upon said driving means support, oppositely wound and lineally spaced solenoid coils upon said support, a plunger common to both of said solenoid coils and guided within said support, and a connection between one end of said plunger and said strip.

5. The combination set forth in claim 4, and the strip-controlling guide portion of said support providing means for limiting the axial movement of said plunger.

6. A supporting and actuating unit for curtain rolls comprising a bearing support for the roll adjacent one end and at a point remote therefrom and insertable therinto from one end, and a driven element carried by said support and operatively engaged with the roll.

7. In a curtain roll, a support for said roll providing a piston chamber, fluid pipes opening into said chamber at opposite sides of the piston, a strip connected to said piston and having a twisted portion extending beyond said piston chamber, a driving connection between said strip and roll, and one of said fluid pipes cooperating to provide a stop for limiting movement of the piston in one direction.

8. In a curtain roll, an elongated body providing a support for said roll adjacent one end and at a point remote therefrom providing a piston chamber, fluid pipes opening into said chamber at opposite sides of the piston, and a strip connected to said piston and having a twisted portion extending beyond said piston chamber, a driving connection between said strip and roll.

9. A supporting and actuating unit for curtain rolls comprising an elongated body providing a bearing, a support for said roll adjacent one end and at a point remote therefrom and insertable into the roll, said body providing a piston chamber, fluid pipes opening into said chamber at opposite sides of the piston, a strip connected to said piston and having a twisted portion extending beyond said piston chamber, a driving connection between said strip and roll, and valve means for selectively effecting the flow of fluid through said pipes.

10. In a curtain roll and curtain, driving means for the roll and having a source of power, a sup-

port for said drive means, and counterbalancing means in addition to the driving means and carried by the driving means and its support for relieving the source of power of the load of the curtain when same is being moved by the driving means and when it is wholly or partially unrolled.

11. In a curtain roll and curtain, self-contained driving means and a support therefor insertable within the roll, said driving means being operatively connected with the roll, and a counterbalancing coil spring connected to the support and driving means for relieving the latter of the load of the curtain when same is being moved and when it is wholly or partially unrolled.

12. The combination of a curtain roll and curtain, self-contained driving means within the roll and comprising a spiral strip operatively connected with the roll, actuating means for said strip, a support for said strip and actuating means, and a coil spring anchored to said strip at one end and surrounding the same, the other end of said coil spring adapted to engage said support whereby to relieve the actuating means of the load of the curtain when wholly or partially unrolled.

13. The combination of a curtain roll and curtain, driving means for the roll, a support for said driving means, compensating means carried by the driving means and its support for substantially relieving the driving means of the weight of the curtain when same is not fully rolled up, and frictional brake means associated with said driving means and its support and tending to hold said curtain against movement in a predetermined direction.

14. The combination of a curtain roll and curtain, actuating means for the roll, a reversible drive means for said actuating means, a lost motion connection between said actuating and drive means whereby the drive means will have initial free movement when changing from one direction of movement to another, and a brake associated with said drive means and adapted to be released by such initial free movement.

15. The combination of a curtain roller and curtain, a mounting tube upon which said roller is journaled, a pair of lineally spaced solenoid coils wound on said tube and within said roller, a common core for said solenoid coils and slidable in said tube, said core having a flexible rubber washer at one end, said washer being diametrically larger than the tube whereby to seat itself to initially resist movement of said core in a new direction, a spiral rod operatively engaging said roll, said rod extending into said tube and having a lost motion connection with the other end of said core whereby to admit of limited initial free movement of the core in a new direction to unseat said washer, a stabilizing coil spring for substantially counterbalancing the weight of any unwound portion of the curtain, said coil spring being carried by said spiral rod and having one end anchored to an intermediate portion thereof, a slot providing guide element for said rod and located in the adjacent end of said tube, the other end of said spring being adapted to bear against said guide element whereby to be compressed upon inward movement of the spiral rod to unroll the curtain from the roll, and separate stop means for simultaneously limiting inward movement of said core and spiral rod to prevent said spring from back lashing said spiral rod to unseat said washer from holding position.

16. In a curtain roll and self-contained driving means therefor, a spirally twisted strip having an operative connection with the roll, operating means for said strip, a support for said operating means, having a strip guide portion, and said strip guide portion constituting a stop for limiting movement of said operating means in one direction.

17. The combination of a curtain roll, a self-contained driving means within the roll and operatively connected therewith, a support for said operating means, a mounting member for rotatably receiving said support whereby the support may be rotated bodily relatively of the mounting member to roll or unroll the curtain when installing the device, and means for locking said mounting member and support against relative movement.

18. The combination of a curtain roll and reciprocatory driven element within the roll and operatively connected therewith at approximately its axis, a supporting guide for said driven element, and said guide and reciprocatory driven element having cooperating portions for rotating said driven element when it is reciprocated.

19. A supporting and actuating unit for curtain rolls comprising an elongated body insertable into the roll and providing a bearing support for the roll adjacent one end and at a point remote therefrom, said body providing a piston chamber, and a reciprocable piston in said chamber and operatively connected to the roll.

20. In a curtain roll operating means or the like, a reciprocatory operating means, a guide therefor, and a flange-like flexible element carried by said operating means and bucklingly engaging said guide.

21. The combination of a curtain roll and curtain, driving means for the roll, supporting means for said driving means, and a frictional brake element carried by one of said driving means and supporting means and yieldingly engaging the other to resist initial relative movement of the driving and supporting means in a particular direction.

22. The combination of a curtain roll and curtain, actuating means for the roll, a reversible drive means for said actuating means, a lost motion connection between said actuating and drive means whereby the drive means will have initial free movement when changing from one direction of movement to another.

23. The combination of a curtain roll and curtain, actuating means for the roll, a reversible drive means for said actuating means, a lost motion connection between said actuating and drive means whereby the drive means will have initial free movement when changing from one direction of movement to another, means limiting movement of the drive means in one direction, and means in part carried by said actuating means for correspondingly limiting movement of the same in such direction.

24. In a power-operated curtain structure comprising a roll, driving means within the roll and operatively connected therewith, a combined roll and driving means support, and bearing portions independent of the driving connection between the roll and drive means and carried by said roll and engaging said driving means support.

25. In a power-operated curtain structure comprising a roll, a reciprocatory driving means within the roll and operatively connected therewith, a combined roll and driving means support, bearing portions independent of the driving con-

nection between the roll and drive means and carried by said roll and engaging said driving means support, and said support providing a guide for said reciprocatory drive means.

5 26. In a power-operated curtain structure comprising a roll, a reciprocatory driving means within the roll and operatively connected therewith, a combined roll and driving means support, bearing portions carried by said roll and engaging
10 said driving means support.

27. In a power operated curtain structure comprising a roll, a self-contained driving means within the roll, said driving means including a spiral strip operatively engaged with the roll, a
15 support for said driving means and providing a controlling guide for said strip for lineal movement, and bearing portions carried by said roll and journaled upon said driving means support.

28. In a power operated curtain structure comprising a roll, a self-contained driving means within the roll, said driving means including a member having spiral portions operatively engaged with the roll, a support for said driving
20 means and providing a controlling guide for said member for lineal movement, and bearing portions carried by said roll and journaled upon said driving means support.

29. A supporting and actuating unit for curtain rolls comprising a bearing support for the roll and
30 insertable therein from one end, and a lineally driven spirally twisted strip carried by said support and having at least the major portion of its width operatively engaged with the roll.

30. The combination of a curtain device comprising a roll, self-contained reciprocatory driving means within the roll, a spirally twisted strip incorporated in said reciprocatory driving means and operatively connected with the roll, a support for said driving means, and roll-supporting
35 bearing means journaled upon said driving means support and engaging the roll at lineally spaced points whereby the driving means support constitutes a complete support for the roll.

31. The combination of a curtain roll, a self-contained driving means within the roll, said driving means including a reciprocally driven spirally twisted strip having at least the major portion of its width operatively engaged with the roll, and a support for said driving means and
40 providing a controlling guide engaging said strip in its lineal movement.

32. The combination of a rotatably mounted curtain roll, a lineally operable spirally twisted strip extending into and having at least the major
55 portion of its width operatively engaged with the roll, and means for reciprocating said strip whereby to rotate the roll.

33. The combination of a curtain roll, a strip having oppositely twisted spiral portions extending toward its respective ends, one spiral portion of the strip extending into the roll and being operatively engaged therewith, a support engaging and providing a controlling guide for the other spiral strip portion, and means for reciprocating
60 said strip.

34. The combination of a curtain roll, a self-contained driving means within the roll, said driving means including a reciprocally driven strip having oppositely twisted spiral portions extending in opposite directions toward the respective ends of the strip, a support for said driving means and operatively engaging one spirally twisted strip portion to provide a controlling guide for the strip in its lineal movement, an operative
70 connection between the other spirally twisted

strip portion and the roll, and roll-supporting bearing means journaled on said driving means support at lineally spaced points.

35. The combination of a curtain roll, a self-contained driving means within the roll, said driving means including a reciprocally driven strip having oppositely twisted spiral portions extending in opposite directions toward the respective ends of the strip, a support for said driving means and operatively engaging one spirally
10 twisted strip portion to provide a controlling guide for the strip in its lineal movement, and an operative connection between the other spirally twisted strip portion and the roll.

36. The combination of a curtain roll, a driving means within the roll, said driving means including a reciprocally driven strip having oppositely twisted spiral portions extending in opposite directions toward the respective ends of the strip, a support operatively engaging one spirally
15 twisted strip portion to provide a controlling guide for the strip in its lineal movement, and an operative connection between the other spirally twisted strip portion and the roll.

37. The combination of a curtain roll, a driven element operatively connected therewith, driving means for said driven element, and a lost motion connection between said driving means and driven element.

38. The combination of a curtain roll, a spirally twisted strip operatively connected therewith and adapted to extend therein, reciprocatory driving means for said strip, and a lost motion connection between driving means and strip.

39. In a curtain roll, an actuating unit insertable therein from one end, a lineally driven spirally twisted strip incorporated in said unit operatively engaged with the roll, reciprocatory driving means for said strip, and a lost motion connection between said driving means and strip.

40. The combination of a curtain roll, a strip having oppositely twisted spiral portions extending toward its respective ends, one spiral portion of the strip extending into the roll and being operatively engaged therewith, a support engaging and providing a controlling guide for the other spiral strip portion, and means for reciprocating said strip, and a lost motion connection between said last named means and strip.

41. The combination of a curtain roll, actuating means for the roll, a reversible drive means for said actuating means, a lost motion connection between said actuating and drive means whereby the drive means will have initial free movement when changing from one direction of
55 movement to another, and a brake associated with said drive means.

42. The combination of a rotatably mounted curtain roll, a lineally operable spirally twisted strip extended into and operatively engaged with
60 the roll, means for reciprocating said strip whereby to actuate the roll, and brake means for holding the roll against rotation when the strip is stationary relative to said roll.

43. The combination of a rotatably mounted curtain roll, a lineally operable spirally twisted strip extended into and operatively engaged with the roll, drive means for reciprocating said strip whereby to actuate the roll, and brake means associated with and acting through said drive
70 means.

44. The combination of a rotatably mounted curtain roll, a lineally operable spirally twisted strip extended into and operatively engaged with the roll, operating means for said strip and in- 75

cluding a solenoid plunger, a lost motion connection between said solenoid plunger and said strip, and brake means for holding the roll against rotation when the solenoid plunger is stationary.

5 45. The combination of a rotatably mounted curtain roll, a lineally operable spirally twisted strip extended into and operatively engaged with the roll, operating means for said strip and including a solenoid plunger, and a lost motion
10 connection between said solenoid plunger and said strip.

46. The combination of a rotatably mounted curtain roll, a lineally operable spirally twisted strip extended into and operatively engaged with
15 the roll, operating means for said strip and including a solenoid plunger, and brake means for holding the roll against rotation when the solenoid plunger is stationary.

20 47. A supporting and actuating unit for curtain rolls comprising a solenoid magnet, a sleeve incorporated in said magnet and providing a bearing support for the roll and insertable there-

into from one end, said magnet having a core slidable in said sleeve, and a spirally twisted strip connected to said core and adapted to be operatively engaged with the roll.

48. A reeling apparatus comprising, a solenoid 5 provided with an axially movable core, an operating circuit for said solenoid, a winding drum, and means operatively connecting said core and drum for translating linear movement of the core into rotary movement of the drum. 10

49. In a reeling apparatus, a driving member arranged for reciprocal linear movement, a driven member arranged for rotary movement, a reeling drum on said driven member, means for reciprocating said driving member, means on said driving member for rotating said driven member as the driving member moves, and means operable by the driving member at each extent of its movement for restraining said driven member against any rotation not imparted by said driving 20 member.

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