

May 2, 1933.

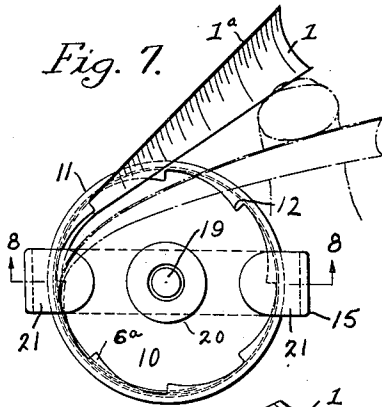
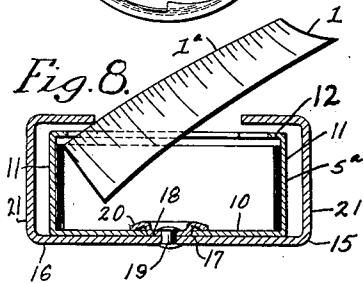
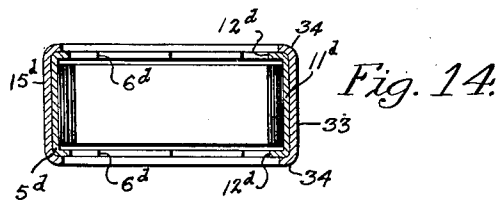
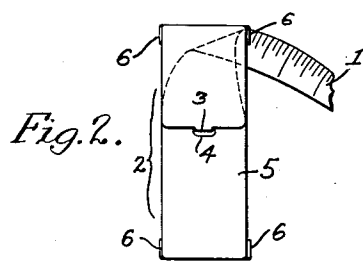
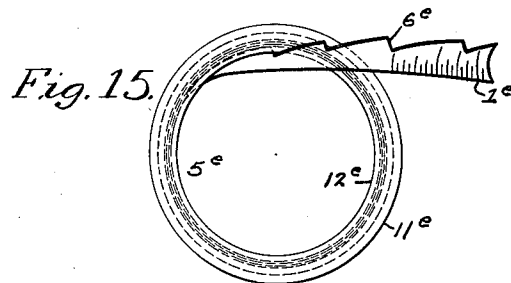
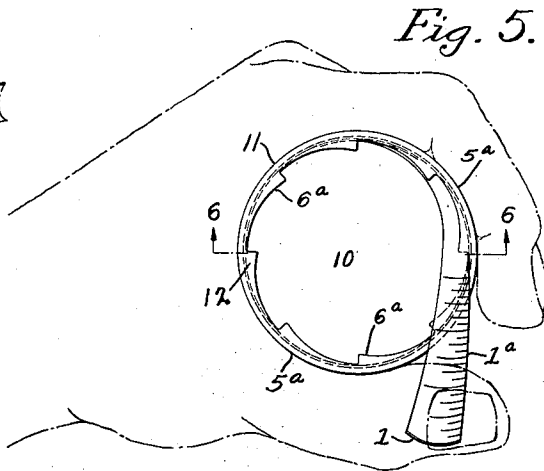
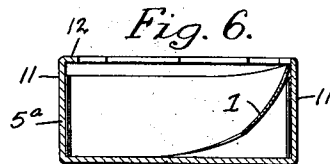
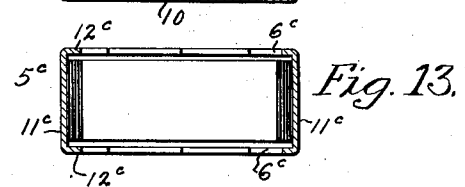
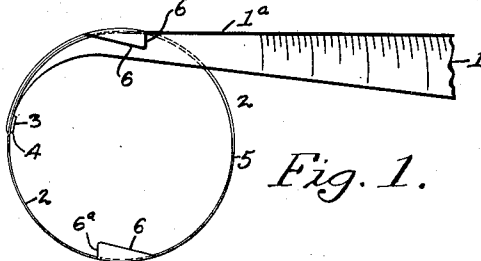
H. A. FARRAND

1,906,456

MEANS FOR CONTROLLING RESILIENT RULES

Filed Nov. 15, 1927

2 Sheets-Sheet 1



Inventor —
Hiram A. Farrand
by his Attorneys
Houson + Houson

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H. A. FARRAND

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MEANS FOR CONTROLLING RESILIENT RULES

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2 Sheets-Sheet 2

Fig. 3.

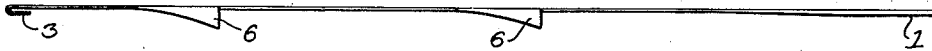


Fig. 4.

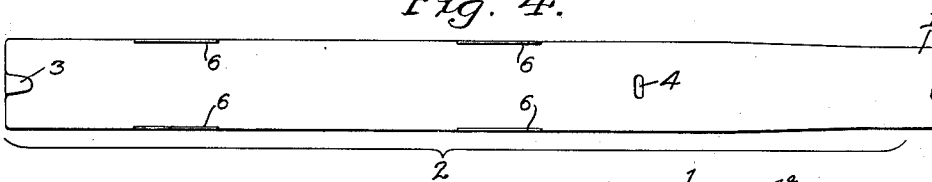


Fig. 12.

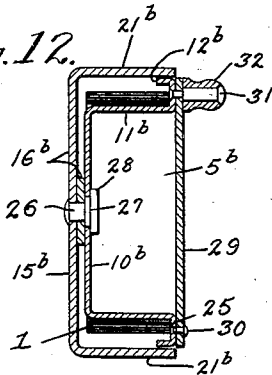


Fig. 11.

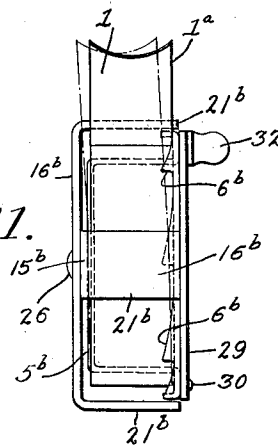


Fig. 9.

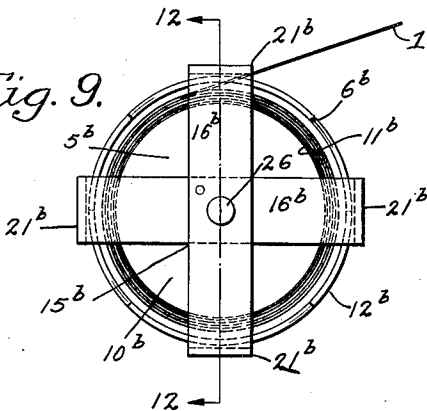
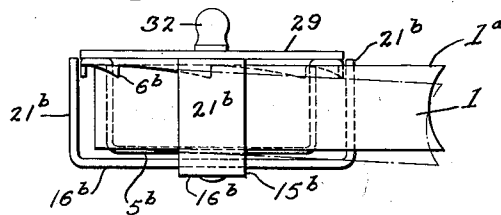


Fig. 10.



Inventor-
Hiram A. Farrand
by his Attorneys,
Howan + Howan

UNITED STATES PATENT OFFICE

HIRAM A. FARRAND, OF BERLIN, NEW HAMPSHIRE, ASSIGNOR TO HIRAM A. FARRAND, INC., OF BERLIN, NEW HAMPSHIRE, A CORPORATION OF NEW HAMPSHIRE

MEANS FOR CONTROLLING RESILIENT RULES

Application filed November 15, 1927. Serial No. 233,417.

This invention relates to means for controlling the movement of resilient rules of the concavo-convex type to and from a coiled condition. This type of rule will, if unrestrained, assume a substantially straight rod-like condition due to its inherent tendencies.

The principal object of this invention is to provide a controlling means in the form of a holder for this type of rule, which will overcome the said inherent tendencies to such an extent that only the desired portion of the total length of the rule, which is manually permitted to uncoil, will assume the said straight rod-like condition, the remainder of the rule remaining quiescent in its coiled state.

Another object of the invention is to so construct the coil holder that the accidental uncoiling of the rule, either in part or complete, will be automatically prevented and the uncoiling movement of the rule arrested as soon as the manual guidance of the rule is ended.

Referring to the accompanying drawings: Fig. 1 is a side elevation of a primitive form of my invention;

Fig. 2 is an edge view of the structure shown in Fig. 1;

Fig. 3 is an edge view of one end of the rule before its conversion into the form illustrated in Fig. 1;

Fig. 4 is a face view of the portion of the rule illustrated in Fig. 3;

Fig. 5 is a side elevation of an advanced form of the invention;

Fig. 6 is a sectional view taken on the line 6-6 of Fig. 5;

Fig. 7 is a side elevation of another advanced form of the invention;

Fig. 8 is a sectional view taken on the line 8-8 of Fig. 7;

Fig. 9 is a side elevation of still another advanced form of the invention;

Fig. 10 is a plan view of the structure shown in Fig. 9;

Fig. 11 is an edge view of the same structure;

Fig. 12 is a sectional view taken on the line 12-12 of Fig. 9;

Fig. 13 is a variation of the structure shown in Fig. 6;

Fig. 14 is a variation of the structure shown in Fig. 8, and

Fig. 15 is a side elevation of the modified form of the invention.

Referring to Figs. 1, 2, 3 and 4, 1 indicates a portion of a resilient rule of the concavo-convex type, such as that illustrated in my copending application, Serial No. 143,267, filed October 21, 1926, Patent #1,828,401. The portion indicated at 2 in Fig. 4 is of a substantially flat cross-sectional configuration. On the end of the flat portion 2, I form a hook 3 which is adapted to enter an opening 4 formed in the said portion 2 of the rule for the purpose of forming a substantially circular holder 5, as illustrated in Figs. 1 and 2. On each of the longitudinally extending edges of the portion 2 of the rule, I form a series of projections or teeth 6, 6 which extend substantially perpendicularly to the plane of the flat portion 2 of the rule.

In order to reduce the rule 1 into a substantially compact coil, the holder portion 5 of the rule is held in the hand of the person using the rule in the manner illustrated in Fig. 5, and by grasping the rule 1 by the fingers of the other hand and moving the rule longitudinally toward the holder 5 the said holder if lightly grasped by the person will revolve within his grasp, the rule being transformed into a substantially compact coil, the successive convolutions of which are formed one within the other and within the holder section 5 thereof.

In changing the rule from the straight form to a coil, the concavo-convex cross-sectional configuration of the rule is changed to a substantially flat cross-sectional configuration and the inherent tendency of the rule to return to the concavo-convex cross-sectional configuration will cause the said rule to automatically assume its straight rod-like condition unless some form of restriction is placed on the rule when in its coiled state. It is for this purpose that the projections 6 are formed on the holder 5, and as the holder revolves when the rule is being coiled the

said projections 6 act as ratchet teeth against the edge 1a of the rule 1. As soon as the manual restriction is removed from the straight part of the rule 1, this said portion of the rule would tend to immediately uncoil. This tendency will cause the rule to remain against the shoulder of the engaged projections 6, and thereby prevent further unwinding of the said rule. Obviously the accidental uncoiling of the rule will be automatically prevented.

In order to manually permit the uncoiling of the rule, the holder 5 is held loosely in the hand in the manner illustrated in Fig. 5 and the end of the rule extending outside the holder is pressed by one of the fingers of the other hand toward the center of the holder 5 which releases the edge 1a from the engaged tooth 6, whereupon the said inherent tendency of the rule to assume its concavo-convex cross-sectional configuration will cause the said rule to uncoil as long as the said edge 1a thereof is pressed inward, thereby guiding the said edge away from the teeth 6 of the holder and permitting said holder to rotate freely within the grasp of the person manipulating the rule. When the rule is completely wound into a compact coil, the free end of the said rule is placed within the holder 5 between the aligned teeth 6, 6 on the opposite longitudinal edges of the holder 5, thereby eliminating any possibility of the said end becoming loosened and getting outside of the said holder 5.

In the form of the invention illustrated in Figs. 5 and 6, the holder 5a is a separate and distinct element from the rule 1, and comprises a cup-shaped element having a bottom 10. The circular side wall 11 is provided with an intumed flange 12 in which the ratchet teeth 6a are formed. The operation of this form of the invention is the same as that described relative to the form illustrated in Fig. 1.

The form of the invention illustrated in Figs. 7 and 8 is the same as that illustrated in Fig. 5, being provided with an outer frame 15 on which the holder 5a is rotatably mounted. The frame 15 comprises a body portion 16 against which the bottom 10 of the cup-shaped holder 5a rotates, the said bottom 10 being provided with a suitable centrally located aperture 17 which is adapted to receive a retaining element 18, which is secured to the body portion 16 of the frame 15 by means of a rivet 19, the retaining element 18 being provided with an annular flange 20 which extends over the bottom 10 around the aperture 17 therein, thereby securing the holder 5a to the frame 15 but permitting rotation of the holder relative to the said frame. The body portion 16 of the frame is provided with extensions 21, 21 which lie parallel to the side wall 11 of the holder 5a, the said extensions 21 being turned inward over the

intumed flange 12 of the holder 5a, as illustrated in Figs. 7 and 8. In this form of the device coiling and uncoiling of the rule is effected in the same general manner as above described with the exception that the person operating the rule may grip the extensions 21 of the frame 15 between the thumb and first finger of the one hand permitting a more convenient manipulation of the rule.

In the forms of the invention thus far described, the rule has been shown as being wound into an internally wound coil in which the successive convolutions are laid one against the other from the inner wall of the holder 5 inwardly toward the center of said holder, and the concaved face of the rule placed toward the center of the holder.

In the form of the invention illustrated in Figs. 9, 10, 11 and 12, the rule is formed into an externally wound coil, that is, each successive convolution of the coil is superposed upon the underlying convolution and the concaved face of the rule is placed outwardly for reasons hereinafter described. In this form of the invention the holder 5b comprises a bottom 10b having a circular wall 11b integrally formed therewith. The said circular wall 11b is provided with an annular laterally extending flange 25. The said laterally extending flange 25 is provided with an intumed flange 12b which in this instance is parallel to the circular wall 11b of the holder. The flange 12b is provided with a series of ratchet teeth 6b. The holder 5b is rotatably mounted in a frame 15b comprising two body members 16b, 16b extending at right angles to each other as illustrated in Fig. 9, on each of which is provided an extension 21b parallel to the circular wall 11b of the holder 5b. The two body members 16b are secured together by means of a centrally located rivet 26, which is provided with an enlarged portion 27 constituting a pivot for the holder 5b, a head 28 being formed on the rivet 26 which rotatably secures the said holder to the said frame.

A top plate 29 is provided for the holder 5b and extends parallel to the bottom 10b thereof, being secured to the lateral flange 25 of the holder 5b by means of rivets 30. One of the rivets is provided with an extension 31 forming a pivot for the finger grip 32, by means of which the holder 5b may be rotated relative to the frame 15b, the same being held in one hand of the person manipulating the rule in much the same manner as illustrated in Fig. 5, the free end of the rule being permitted to run between the end of the thumb and the first finger of the operator.

In externally wound coils, such as that illustrated in the said Figs. 9, 10, 11 and 12, it is desirable to turn the concaved face of the rule outward for the purpose of obtaining the better and firmer engagement between the ratchet teeth 6b and the edge 1a of the rule 1

which will be apparent upon reference to Fig. 11.

As the rule is being wound upon the holder 5b the teeth 6b will move the body of the rule 11, which extends tangentially from the outer convolution of the coil, from the position shown in full lines in Fig. 11 to that shown in broken lines in said figure, the tendency of the rule to assume its natural straight condition causing the said edge 1a of the rule to assume the full line position as each successive tooth 6b passes the edge 1a of the rule. Obviously if the operator were to release the finger grip 32, the holder 5b would immediately rotate in the direction to permit the uncoiling of the rule, which would be automatically arrested by the first tooth 6b engaging the edge 1a of the rule in much the same manner as the operation of a common form of pawl and ratchet mechanism.

The variation of the invention illustrated in Fig. 13 comprises a holder 5c which consists of an annular wall 11c having an intumed flange 12c, 12c at each of its opposite edges, and in each of which is formed a series of flat teeth 6c, 6c. This form of the device is adapted to be operated in the same manner as the form illustrated in Figs. 5 and 6 having the advantage of allowing the rule to be extended from either side of the holder, whereas in the form illustrated in Figs. 5 and 6 the said rule is extensible from one side of the holder only, this form of the device being more convenient for use by persons who are left handed.

The form of the invention shown in Fig. 14 comprises the same form of holder illustrated in Fig. 13, which is provided with a frame 15d consisting of an annular wall 33 which surrounds the circular wall 11d of the holder 5d, and is provided at each of its opposite edges with an intumed flange 34 which partially overlies the intumed flange 12d of the holder. The intumed flanges 12d are provided with the usual series of ratchet teeth 6d. The relative proportion of the holder 5d and the supporting frame 15d are such that the said holder is permitted free rotational movement within the said frame.

In the form of the invention illustrated in Fig. 15, the holder 5e comprises the usual circular wall 11e having an intumed flange 12e formed thereon. In this form of the invention the flange 12e is plain, and the rule 1e is provided along one of its longitudinal edges with a series of ratchet teeth 6e which are adapted to engage the flange 12e of the holder and thereby arrest the rule in its uncoiling movement in substantially the same manner as above described with respect to the other forms of the invention.

While I have described my invention in connection with a resilient rule, obviously the invention is applicable to any form of resilient spring, which possesses the inherent

tendency to assume a rectilinear state, irrespective of its function.

I claim:

1. The combination with a resilient rule element having an inherent tendency to assume a rectilinear state, of an annular element adapted for use in converting said rule element into a coil, and a shoulder formed on one of said elements and adapted to engage the other of said elements to maintain the rule element in a coiled state against its said inherent tendency.

2. A device for controlling a resilient rule element having an inherent tendency to assume a rectilinear state, said device comprising an annular element adapted for use in converting said rule element into a coil, and a shoulder formed on said annular element and adapted to engage the rule element to maintain the rule element in a coiled state against its said inherent tendency.

3. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising an annular holder adapted for use in converting said rule from said rectilinear state to a curvilinear state in the form of a coil; and a shoulder formed on said annular holder and adapted to engage one edge of said rule as it is projected from said holder, for the purpose of arresting the unwinding action of the rule from its coiled state as effected by the said inherent tendency thereof.

4. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a holder adapted for use in converting said rule from said rectilinear state to a curvilinear state in the form of a coil and adapted to support the coil; a flange on said holder adjacent one edge of the coiled rule; and a shoulder formed on said flange and adapted to engage the adjacent edge of said rule as it is unwound from said coil by the said inherent tendency thereof.

5. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a holder adapted for use in converting said rule from said rectilinear state to a curvilinear state in the form of a coil and adapted to support the coil; a flange on said holder adjacent one edge of the coiled rule; and a series of ratchet teeth formed on said flange and adapted to engage the adjacent edge of said rule as it is unwound from said coil by the said inherent tendency thereof.

6. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a holder adapted for use in converting said rule from said rectilinear state to a curvilinear state in the form of a coil; a shoulder formed on said holder and adapted

to engage one edge of that portion of the rule which may be projected from its otherwise coiled state in said holder, for the purpose of arresting further unwinding of the rule due to its inherent tendency; and a frame for rotatably supporting said holder.

7. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a holder adapted for use in converting said rule from said rectilinear state to a curvilinear state in the form of a coil; said holder comprising an annular wall against which said rule is wound; a flange on said annular wall and adjacent one edge of said coiled rule when coiled against said wall for preventing lateral displacement of said coil relative to the said annular wall; and a series of ratchet teeth formed on said flange adapted to engage the adjacent edge of said rule as it is permitted to reassume its rectilinear state.

8. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a holder adapted for use in converting said rule from said rectilinear state to a curvilinear state in the form of a coil; said holder comprising an annular wall against which said rule is wound; a laterally extending flange on said annular wall; and a series of ratchet teeth formed on said flange and adapted to engage the adjacent edge of said rule when projected from said coil.

9. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a cup-shaped holder adapted for use in converting the said rule from said rectilinear state to a curvilinear state in the form of an internally wound coil, said holder comprising a bottom; a circular wall perpendicular to said bottom and against which the outer convolution of said internally wound coil rests; an inturned laterally extending flange on said circular wall and remote from said bottom and adjacent one edge of said coiled rule; and a series of ratchet teeth formed on said flange and adapted to engage the adjacent longitudinal edge of said rule when projected from said cup-shaped holder.

10. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a cup-shaped holder adapted for use in converting the said rule from said rectilinear state to a curvilinear state in the form of an internally wound coil, said holder comprising a bottom; a circular wall perpendicular to said bottom and against which the outer convolution of said internally wound coil rests; an inturned laterally extending flange on said circular wall and remote from said bottom and adjacent one

edge of said coiled rule; a series of ratchet teeth formed on said flange and adapted to engage the adjacent longitudinal edge of said rule when projected from said cup-shaped holder; and a frame for rotatably supporting said cup-shaped holder.

11. Means for controlling a resilient rule and the like having an inherent tendency to assume a rectilinear state, said means comprising a cup-shaped holder adapted for use in converting the said rule from said rectilinear state to a curvilinear state in the form of an internally wound coil, said holder comprising a bottom; a circular wall perpendicular to said bottom and against which the outer convolution of said internally wound coil rests; an inturned laterally extending flange on said circular wall and remote from said bottom and adjacent one edge of said coiled rule; a series of ratchet teeth formed on said flange and adapted to engage the adjacent longitudinal edge of said rule when projected from said cup-shaped holder; a frame for rotatably supporting said cup-shaped holder comprising a main element, lying adjacent and substantially parallel to the bottom of said cup-shaped holder, having extensions projecting substantially parallel to the said circular wall of said holder; and a pivot element for rotatably securing the bottom of said cup-shaped holder to the said main element of said frame.

12. The combination with a resilient rule element having an inherent tendency to assume a rectilinear state, of a coil forming and supporting element adapted for use in converting the rule element into a coil and for supporting said coil, and a relatively fixed shoulder on one of said elements and adapted to engage the other of said elements to prevent self-impelling of the rule element with respect to the coil-supporting element.

13. The combination with a resilient rule element having an inherent tendency to assume a rectilinear state, of a coil forming and supporting element adapted for use in converting the rule element into a coil and for supporting said coil, and a relatively fixed shoulder on the coil-supporting element adapted to engage said rule to prevent self-impelling of the rule with respect to the coil-supporting element.

14. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring adapted for use in converting the strip element into a coil and for supporting the coil.

15. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring attached to one end of the strip element and adapted for use in converting the strip element into a coil and for supporting the coil.

16. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring permanently attached to one end of the strip element and adapted for use in converting the strip element into a coil and for supporting the coil.

17. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring forming an integral part of the strip element and adapted for use in converting the strip element into a coil and for supporting the coil.

18. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring composed of a portion of the strip element adjacent one end thereof and adapted for use in converting the strip element into a coil and for supporting the coil.

19. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring comprising a portion of the strip element adjacent one end thereof bent longitudinally and the said end of the strip element attached to the strip element at a point spaced from said end, said ring being adapted for use in converting the strip element into a coil and for supporting the coil.

20. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring comprising a portion adjacent one end of the strip element bent longitudinally and the said end of the strip element being detachably secured to the strip element at a point spaced from said end, said ring being adapted for use in converting the strip element into a coil and for supporting the coil.

21. The combination with a resilient rule strip element having an inherent tendency to assume a rectilinear state, of a resilient ring adapted for use in converting the strip element into a coil and for supporting the coil, and means adapted to co-operate with said resilient ring to prevent self-impelling of the strip element relative to the resilient ring.

22. A device, for controlling a resilient rule having an inherent tendency to assume a rectilinear state, comprising a drum on which the rule is adapted to be wound in the form of an externally wound coil, and a shoulder on said winding drum adapted to engage said rule to prevent unwinding of the rule from the drum.

23. A device, for controlling a resilient rule having an inherent tendency to assume a rectilinear state, comprising a drum on which the rule is adapted to be wound in the form of an externally wound coil, a flange at one edge of the drum, and a shoulder on

said flange adapted to engage an adjacent edge of the rule to prevent unwinding of the rule from the drum.

24. A device, for controlling a resilient rule having an inherent tendency to assume a rectilinear state, comprising a drum on which the rule is adapted to be wound in the form of an externally wound coil, a flange at one edge of the drum, a shoulder on said flange adapted to engage an adjacent edge of the rule to prevent unwinding of the rule from the drum, and a frame for rotatably supporting said drum.

25. A device, for controlling a resilient rule having an inherent tendency to assume a rectilinear state, comprising a drum on which the rule is adapted to be wound in the form of an externally wound coil, a flange at one edge of the drum, a shoulder on said flange adapted to engage an adjacent edge of the rule to prevent unwinding of the rule from the drum, and a frame for rotatably supporting said drum, and comprising a section disposed adjacent the edge of the drum opposite said flange and between which and the said flange the rule is coiled on said drum.

26. A device, for controlling a resilient rule having an inherent tendency to assume a rectilinear state, comprising a drum on which the rule is adapted to be wound in the form of an externally wound coil, a flange at one edge of the drum, a shoulder on said flange adapted to engage an adjacent edge of the rule to prevent unwinding of the rule from the drum, a frame for rotatably supporting said drum, and comprising a main section disposed adjacent the edge of the drum opposite said flange and between which and the said flange the rule is coiled on said drum, and a section extending from said main section transversely across said drum from the main section of the frame toward the flange on the drum.

HIRAM A. FARRAND.