March 31, 1931. H. A. FARRAND 1,799,044

MEANS FOR CONTROLLING RESILIENT RULES

Filed July 5, 1929

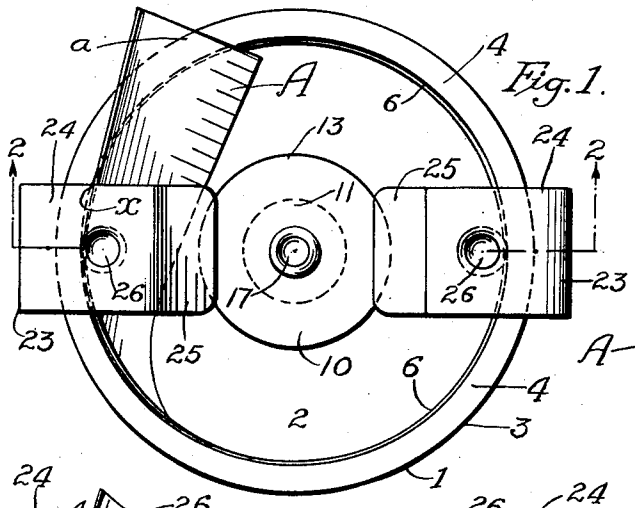


Fig. 1.

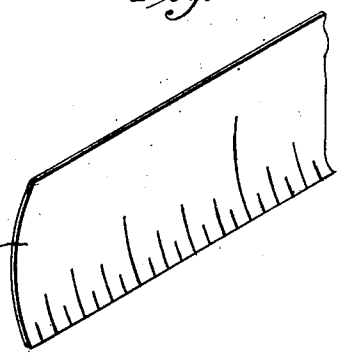


Fig. 5.

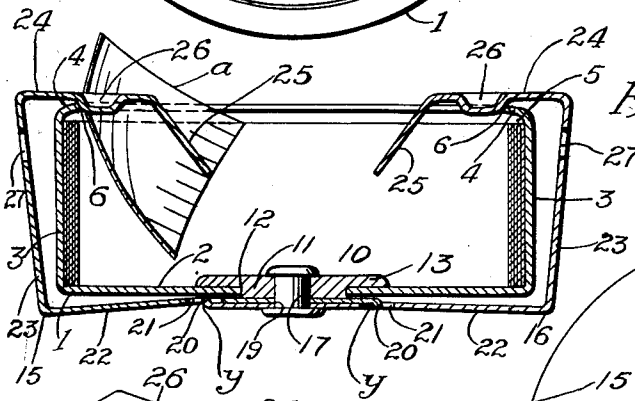


Fig. 2.

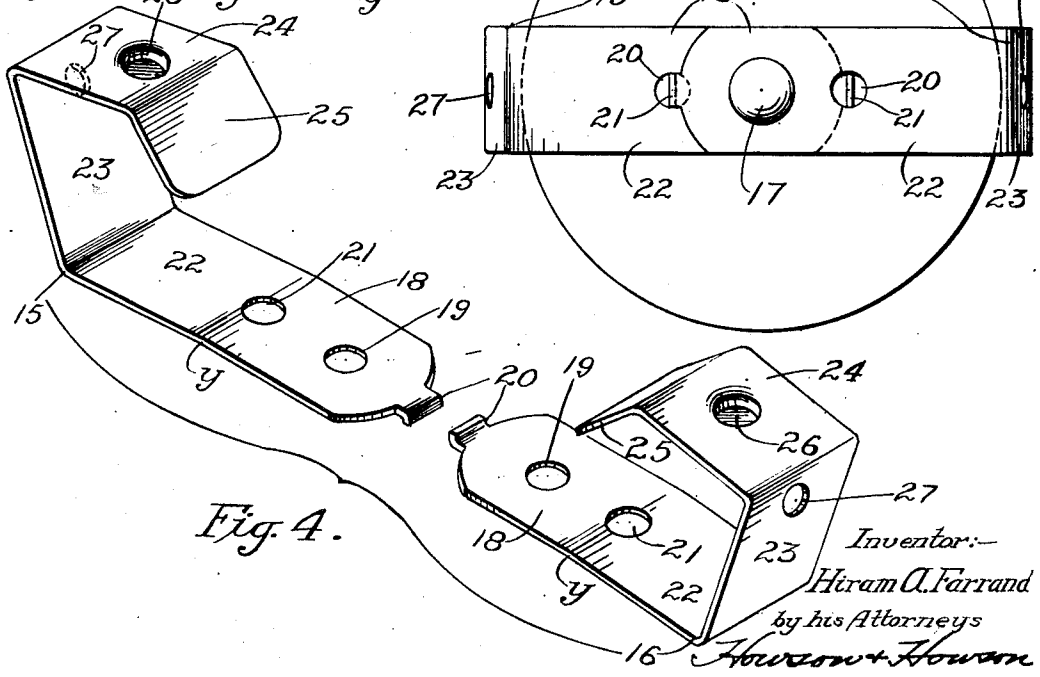


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE

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MEANS FOR CONTROLLING RESILIENT RULES

Application filed July 5, 1929. Serial No. 376,214.

This invention relates to means for controlling resilient rules of the concavo convex type, that is a rule composed of a relatively thin strip of spring metal bent transversely in such a manner that one face of the rule is concaved and the opposite face is convexed and substantially parallel to the concaved face.

A rule of this type has an inherent tendency to assume at all times a rectilinear state, that is, if the rule is unrestricted it will extend itself into a straight rod-like form, and the cross-sectional curvature of the rule will maintain it in its rectilinear state.

The controlling means for a rule of this type, which forms the subject matter of the present invention, constitutes an improvement on a somewhat similar device illustrated in my co-pending application, Serial No. 310,578, filed October 5, 1928.

The object of the present invention is to provide a controlling means, which will be as efficient as any of the types shown in the said co-pending application and at the same time be composed of a relatively smaller number of parts than the more complicated forms illustrated in the said co-pending application.

Another object of the invention is to so construct the elements of which the device is composed that they will be durable and capable of standing rough usage such as a device of this character is subjected to, and at the same time be relatively inexpensive to manufacture and assemble.

The construction and operation of the device forming the subject of the present application will be fully disclosed hereinafter, reference being had to the accompanying drawings, of which:

Fig. 1 is a plan view;

Fig. 2 is a sectional elevation taken on the line 2—2, Fig. 1;

Fig. 3 is an inverted plan view;

Fig. 4 is a detached perspective view of certain details of the invention; and

Fig. 5 is a fragmentary perspective view of the concavo-convex type of rule.

The device comprises a suitable cup or holder 1 having a bottom 2, around the periphery of which is formed a circular flange or wall 3, which extends substantially at right angles to the plane of the bottom 2. The upper edge of the circular wall 3 is provided with an inturned flange 4 which extends at an angle relative to the circular wall 3, and also at an angle with respect to the plane of the bottom 2.

As shown in Fig. 2, the rule A is completely wound into an internally wound coil. The outer convolution of such a coil lies in contact with the inner surface of the circular wall 3, and the subsequent convolutions lie one within the other and in contact with each other, as clearly illustrated in said figure.

When in its unrestricted form, the rule assumes a transverse curvature, such as illustrated in Fig. 5, but when the rule is wound within the cup or holder 1 the cross-section of the rule is transformed from the arcuate form shown in Fig. 5 to the flat form illustrated in Fig. 2. The wound coil lies within a circular pocket 5 defined by the inner edge 6 of the inturned flange 4 and the inner surface of said circular wall 3.

Mounted within and axially aligned with the cup 1 is a suitable pivot structure 10. The pivot structure 10 comprises a circular element 11 adapted to fit within a similarly formed opening 12 in the bottom 2 of the cup 1. The circular element 11 is provided with a flange 13 at its upper end which overlies and rests upon the inner surface of the bottom 2 of the cup 1.

Bearing against the opposite end of the circular member 11 is one end of a brake arm 15. Bearing against the said end of the brake arm 15 is the corresponding end or a similar brake arm 16, the said ends of the said arms being secured to the circular pivot member 11 by means of a rivet or other suitable fastening element 17 which is axially aligned with the pivot member 11 and extends through the same and through the superposed ends of the said arms 15 and 16. Each of the brake arms 15 or 16 comprises a flat end 18 which is provided with an aperture 19, through which the securing element 17 extends. The ends 18, 18 of the arms 15

and 16 are adapted, when the device is assembled as in Fig. 2, to lie substantially parallel to the bottom 2 of the holder 1. The extreme end of each of the flat portions 18 is provided with a tongue 20 which is bent at right angles to the plane of the flat portion 18 and is adapted to extend into an opening 21 formed in the other of the said brake arms.

In the drawings, the tongue 20 of the arm 15 extends downwardly into the opening 21 of the arm 16, and the tongue 20 of the arm 16 extends upwardly into the opening 21 of the arm 15. Other than this difference the two arms 15 and 16 are of identical construction, each comprising a portion 22 which is disposed in a plane extending at an angle with respect to the plane of the flat portion 18 of the arm, being thereafter bent substantially at right angles to form a portion 23 which is adapted to extend upwardly and to the outside of the circular wall 3 of the cup 1, the upper end of the portion 23 being bent inwardly toward the flat portion 18 as illustrated at 24, the portions 24, 24 of the said arms 15 and 16 extending above the inturned flange 4 of the cup 1 and terminating at their inner ends in sections 25, 25 which are bent at an obtuse angle with respect to the portions 24, and these angular portions 25, 25 extend downwardly into the said cup a substantial distance below the inturned flange 4 thereof.

As shown in the drawings, each of the inturned sections 24 is provided with a downwardly extending projection 26 which, in the present instance, is formed by depressing the metal of which the arm is composed but which may obviously be an independent element riveted, welded, or otherwise secured to the underside of the portion 24 of the arm. These projections 26, 26 as illustrated in Figs. 1 and 2 of the drawing are adapted to engage the inner edge 6 of the flange 4 of the cup 1, and thereby prevent relative rotation between the arms 15 and 16 and the said cup 1.

In operation the portions 23, 23 of the brake arms 15 and 16 respectively are adapted to be gripped, for example, between the thumb and first finger of the left hand. One end of the rule is then placed in the cup between the downwardly extending portion 25 of the arm, which is gripped by the first finger, and the point of intersection indicated at x in Fig. 1 of the one edge of the arm with the inner edge 6 of the flange 4. By pressing the arms 15 and 16 toward the cup 1 the projections 26, 26 are released from engagement with the inner edge 6 of the flange 4, whereby free rotation of the cup 1 is permitted relative to the arms 15 and 16, and by subsequently pushing the rule longitudinally and into the cup the rule may be readily wound into an internally wound coil within the circular cavity 5 of the cup.

Releasing of the arms 15 and 16 will permit the said arms to flex at points outward from the points indicated at y, y in Fig. 2, it being understood that the arms 15 and 16 are composed of a relatively springy material and having an inherent tendency to flex around the point y moving the portions 23 and 24 radially outward with respect to the axis of the holder 1 and in opposite directions with respect to each other, whereby the projections 26, 26 will be brought into engagement with the inner edge 6 of the inturned flange 4 at diametrically opposed points thereon for the purpose of preventing relative rotation between the cup 1 and the arms 15 and 16, which would take place due to the inherent tendency of the rule A to assume its rectilinear state.

After the rule has been forced into the holder to the extent illustrated in Figs. 1 and 2, the outer end a of the rule may be readily placed down into the cup so that the said end will bear against the innermost convolution of the coil lying within the circular cavity 5, whereupon pressing of the arms 15 and 16 may be effected without danger of the rule extending itself outward from the cup or holder 1. The inturned and downwardly extending portions 25, 25 of the arms 15 and 16 function to prevent any portions of the rule from accidently moving out of the cup and further act as a means for guiding the rule into the circular cavity 5 and out of the said cavity 5 when the rule is being moved in or out of the coil within the cup 1.

In order to secure a good grip on the portions 23, 23 of the arms 15 and 16 respectively, the said portions 23 are each provided with an opening 27 into which a portion of the finger will extend when pressure is applied to the arms thereby preventing the arms 15 and 16 from accidently slipping relative to the fingers.

From the above description, it will be obvious that I am able to provide an efficient device composed of a minimum number of parts, each of which may be readily produced in mass quantity at a relative low cost, and that due to the small number of parts involved and the simplicity of the construction of these parts they may be readily and quickly assembled by unskilled labor at a relatively low cost.

I claim:

1. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder provided with a circular wall against which the rule is adapted to be wound in the form of a coil, and an inherently resilient arm pivotally mounted on said holder, said arm having a portion adapted under predetermined conditions to engage the holder to prevent relative rotation between the two.

2. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder provided with a circular wall against which the rule is adapted to be wound in the form of a coil, an inherently resilient arm pivotally mounted on said holder, said arm having a portion adapted under predetermined conditions to engage the holder to prevent relative rotation between the two, and a portion so disposed with respect to said circular wall as to guide the rule into and out of the coil formed against the said wall.

3. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder provided with a circular wall against which the rule as adapted to be wound in the form of a coil, an inherently resilient arm pivotally mounted on said holder, said arm having a portion adapted under predetermined conditions to engage the holder to prevent relative rotation between the two, a portion so disposed with respect to said circular wall as to guide the rule into and out of the coil formed against the said wall, and another portion so disposed with respect to the holder as to prevent the accidental displacement of the rule relative to the holder.

4. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder having a circular wall against the inner surface of which the rule is adapted to be wound in the form of an internally wound coil, a plurality of arms pivotally mounted on said holder and extending radially around the outside thereof, at least one of said arms having an inwardly extending portion projecting over one edge of the said circular wall and adapted to guide the rule into position against said circular wall, and at least one of said arms being of an inherently resilient nature and having a portion adapted under predetermined conditions to engage the said holder in a manner to prevent relative rotation between the holder and the arms.

5. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder having a circular wall against the inner surface of which the rule is adapted to be wound in the form of an internally wound coil, a plurality of arms pivotally mounted on said holder and extending radially around the outside thereof, at least one of said arms having an inwardly extending portion projecting over one edge of the said circular wall and adapted to guide the rule into position against said circular wall, at least one of said arms being of an inherently resilient nature and having a portion adapted under predetermined conditions to engage the said holder in a manner to prevent relative rotation between the holder and the arms, and at least one of said arms having a portion extending into the holder to a point spaced inwardly from the said edge of said circular wall to prevent accidental displacement of the rule relative to the holder.

6. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder having a circular wall against the inner surface of which the rule is adapted to be wound in the form of an internally wound coil, a plurality of arms pivotally mounted on said holder and extending radially around the outside thereof, at least one of said arms having an inwardly extending portion projecting over one edge of the said circular wall and adapted to guide the rule into position against said circular wall, at least one of said arms being of an inherently resilient nature and having a portion adapted under predetermined conditions to engage the said holder in a manner to prevent relative rotation between the holder and the arms, and means for preventing relative angular movement between said arms.

7. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder having a circular wall against the inner surface of which the rule is adapted to be wound in the form of an internally wound coil, a plurality of arms pivotally mounted on said holder and extending radially around the outside thereof, at least one of said arms having an inwardly extending portion projecting over one edge of the said circular wall and adapted to guide the rule into position against said circular wall, at least one of said arms being of an inherently resilient nature and having a portion adapted under predetermined conditions to engage the said holder in a manner to prevent relative rotation between the holder and the arms, at least one of said arms having a portion extending into the holder to a point spaced inwardly from the said edge of said circular wall to prevent accidental displacement of the rule relative to the holder, and means for preventing relative angular movement between said arms.

8. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder comprising a substantially flat circular bottom having a peripheral wall disposed substantially perpendicular thereto, against the inner surface of which the rule is adapted to be wound in the form of an internally wound coil, a pair of inherently resilient arms pivoted to the said bottom at the center thereof and extending radially from the axis of said holder around the outside of said holder, each arm having a portion extending inwardly over the open edge of said wall adapted to guide the rule into position against said wall, and a portion adapted to engage the holder

under predetermined conditions to prevent relative rotation between the arms and the holder.

9. The combination, in a device for controlling a resilient rule having an inherent tendency to assume a rectilinear state, of a holder comprising a substantially flat circular bottom having a peripheral wall disposed substantially perpendicular thereto, against the inner surface of which the rule is adapted to be wound in the form of an internally wound coil, a pair of inherently resilient arms pivoted to the said bottom at the center thereof and extending radially from the axis of said holder around the outside of said holder, each arm having a portion extending inwardly over the open edge of said wall adapted to guide the rule into position against said wall, a portion adapted to engage the holder under predetermined conditions to prevent relative rotation between the arms and the holder, and a portion extending into the open side of said holder to a point intermediate the said bottom and the said open edge of the holder to prevent accidental displacement of the rule relative to the holder.

10. The combination, in a device for controlling a resilient rule having a tendency to assume a rectilinear state, of a holder comprising a substantially flat circular bottom and a peripheral wall substantially perpendicular thereto said circular wall having an inturned flange at the open side of the holder providing a circular cavity in which the rule is adapted to be wound in an internally wound coil, a pair of inherently resilient arms pivotally mounted on the bottom of the holder at the center thereof and extending radially in opposite directions from said center around the outside of said holder, each arm having a portion extending inwardly over the said inturned flange adapted to cooperate with said flange to guide the rule into position within the cavity, and a projection on said portion adapted to engage the inturned flange of the holder to prevent relative rotation between the holder and the arms under predetermined conditions.

11. The combination, in a device for controlling a resilient rule having a tendency to assume a rectilinear state, of a holder comprising a substantially flat circular bottom and a peripheral wall substantially perpendicular thereto said circular wall having an inturned flange at the open side of the holder providing a circular cavity in which the rule is adapted to be wound in an internally wound coil, a pair of inherently resilient arms pivotally mounted on the bottom of the holder at the center thereof and extending radially in opposite directions from said center around the outside of said holder, each arm having a portion extending inwardly over the said inturned flange adapted to co-operate with said flange to guide the rule into position within the cavity, a projection on said portion adapted to engage the inturned flange of the holder to prevent relative rotation between the holder and the arms under predetermined conditions, and means for preventing relative angular movement between said arms.

12. The combination, in a device for controlling a resilient rule having a tendency to assume a rectilinear state, of a holder comprising a substantially flat circular bottom and a peripheral wall substantially perpendicular thereto said circular wall having an inturned flange at the open side of the holder providing a circular cavity in which the rule is adapted to be wound in an internally wound coil, a pair of inherently resilient arms pivotally mounted on the bottom of the holder at the center thereof and extending radially in opposite directions from said center around the outside of said holder, each arm having a portion extending inwardly over the said inturned flange adapted to co-operate with said flange to guide the rule into position within the cavity, a projection on said portion adapted to engage the inturned flange of the holder to prevent relative rotation between the holder and the arms under predetermined conditions, and means for preventing relative angular movement between said arms comprising a tongue on at least one of said arms adapted to project into an opening in the other of said arms at a point removed from the said pivot.

13. The combination, in a device for controlling a resilient rule having a tendency to assume a rectilinear state, of a holder comprising a substantially flat circular bottom and a peripheral wall substantially perpendicular thereto said circular wall having an inturned flange at the open side of the holder providing a circular cavity in which the rule is adapted to be wound in an internally wound coil, a pair of inherently resilient arms pivotally mounted on the bottom of the holder at the center thereof and extending radially in opposite directions from said center around the outside of said holder, each arm having a portion extending inwardly over the said inturned flange adapted to co-operate with said flange to guide the rule into position within the cavity, a projection on said portion adapted to engage the inturned flange of the holder to prevent relative rotation between the holder and the arms when the arms are free, and each arm having an opening adjacent the circular wall of the holder into which a portion of a person's finger may protrude when the arms are pressed toward the holder to release the holder for free rotation relative to the arms.

14. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element extending through

an opening formed in the bottom of the holder and having a flange at one end overlying the bottom of the holder around said opening, a pair of inherently resilient arms extending around the outside of the holder in a plane coincident with the pivotal axis of the holder, said arms each having a relatively flat portion disposed in superposed relation to each other and located on the pivot element at the outer end thereof and a portion adapted to engage the holder to prevent relative movement between the holder and the arms, a securing element passing through the pivot element and the said arms for securing the assemblage together, and means for securing the arms against relative angular movement with respect to each other.

15. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element extending through an opening formed in the bottom of the holder and having a flange at one end overlying the bottom of the holder around said opening, a pair of inherently resilient arms extending around the outside of the holder in a plane coincident with the pivotal axis of the holder, said arms each having a relatively flat portion disposed in superposed relation to each other and located on the pivot element at the outer end thereof and a portion adapted to engage the holder to prevent relative movement between the holder and the arms, a securing element passing through the pivot element and the said arms for securing the assemblage together, and means for securing the arms against relative angular movement with respect to each other comprising an element carried by and projecting from one arm and extending into an opening in the other arm.

16. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element extending through an opening formed in the bottom of the holder and having a flange at one end overlying the bottom of the holder around said opening, a pair of inherently resilient arms extending around the outside of the holder in a plane coincident with the pivotal axis of the holder, said arms each having a relatively flat portion disposed in superposed relation to each other and located on the pivot element at the outer end thereof and a portion adapted to engage the holder to prevent relative movement between the holder and the arms, a securing element passing through the pivot element and the said arms for securing the assemblage together, and means for securing the arms against relative angular movement with respect to each other comprising a tongue bent from the plane of the flat portion of one arm and extending into an opening formed in the other of said arms.

17. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element extending through an opening formed in the bottom of the holder and having a flange at one end overlying the bottom of the holder around said opening, a pair of inherently resilient arms extending around the outside of the holder in a plane coincident with the pivotal axis of the holder, said arms each having a relatively flat portion disposed in superposed relation to each other and located on the pivot element at the outer end thereof and a portion adapted to engage the holder to prevent relative movement between the holder and the arms, a securing element passing through the pivot element and the said arms for securing the assemblage together, and means for securing the arms against relative angular movement with respect to each other comprising a tongue on each arm bent at right angles to the plane of the flat portion thereof and adapted to enter an opening formed in the flat portion of the other of said arms.

18. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element rotatably mounted in the bottom of said holder, a pair of inherently resilient arms each having a relatively flat portion secured to the said pivot element, a portion disposed at an angle relative to said flat portion and extending outwardly from said pivot element, adjacent the bottom of the holder, a portion bent substantially at right angles to the said angular portion and adapted to extend upwardly along the side of the holder, a portion bent at an angle relative to said right angle portion and adapted to extend inwardly over the top edge of the holder, and a projection on the last said portion adapted to engage the top edge of the holder.

19. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element rotatably mounted in the bottom of said holder, a pair of inherently resilient arms each having a relatively flat portion secured to the said pivot element, a portion disposed at an angle relative to said flat portion and extending outwardly from said pivot element, adjacent the bottom of the holder, a portion bent substantially at right angles to the said angular portion and adapted to extend upwardly along the side of the holder, a portion bent at an angle relative to said right angle portion and adapted to extend inwardly over the top edge of the holder, a portion bent at an angle relative to the last said portion and adapted to extend downwardly into the holder to a point intermediate the bottom and the top edge of the holder, and a projection on the said inwardly extending portion adapted to engage the upper edge of the holder.

20. The combination, in a device for controlling a resilient rule, of a cup-shaped holder, a pivot element rotatably mounted in the

bottom of said holder, a pair of inherently resilient arms each having a relatively flat portion secured to the said pivot element, a portion disposed at an angle relative to said flat portion and extending outwardly from said pivot element, adjacent the bottom of the holder, a portion bent substantially at right angles to the said angular portion and adapted to extend upwardly along the side of the holder, a portion bent at an angle relative to said right angle portion and adapted to extend inwardly over the top edge of the holder, and a projection on the last said portion adapted to engage the top edge of the holder, the upwardly extending portion of each arm being provided with an aperture affording a grip when the arms are pressed toward the holder to release the holder for free rotation relative to the arms.

21. The combination, with a resilient rule having an inherent tendency to assume a rectilinear state, of a holder having a circular wall against which the rule is adapted to be wound in the form of a coil, and an element adapted to move radially of the holder into contact with one of said elements to prevent rotation of the holder and the coil carrier thereby.

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