March 31, 1931. H. A. FARRAND 1,799,094

MEANS FOR CONTROLLING RESILIENT RULES

Filed Oct. 5, 1928 4 Sheets-Sheet 1

Fig. 1

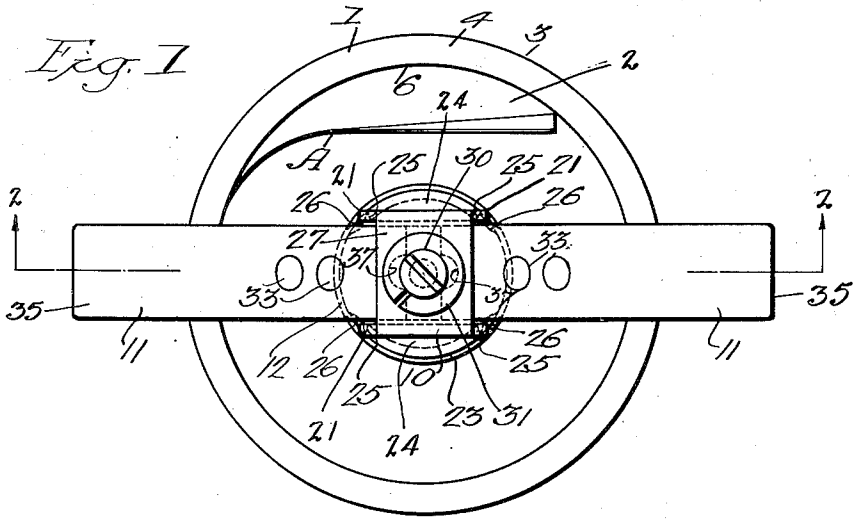


Fig. 2.

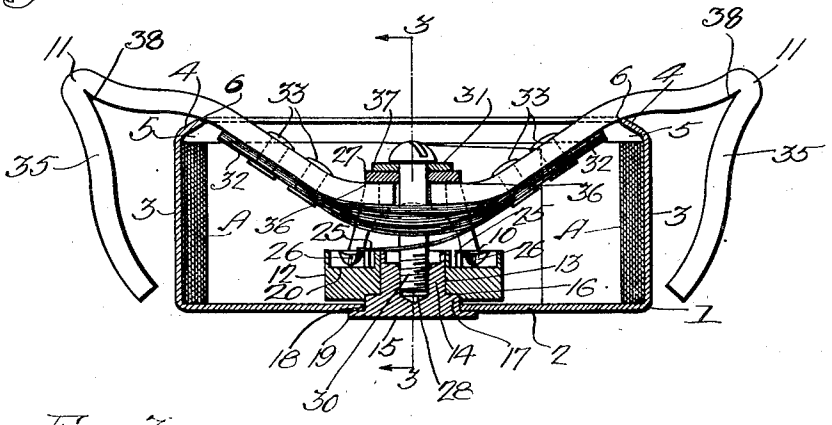
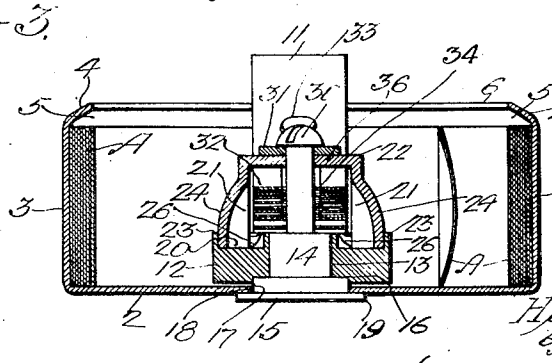


Fig. 3.



Inventor:
Hiram A. Farrand
by his Attorneys.
Howson & Howson

March 31, 1931. H. A. FARRAND 1,799,094

MEANS FOR CONTROLLING RESILIENT RULES

Filed Oct. 5, 1928 4 Sheets-Sheet 2

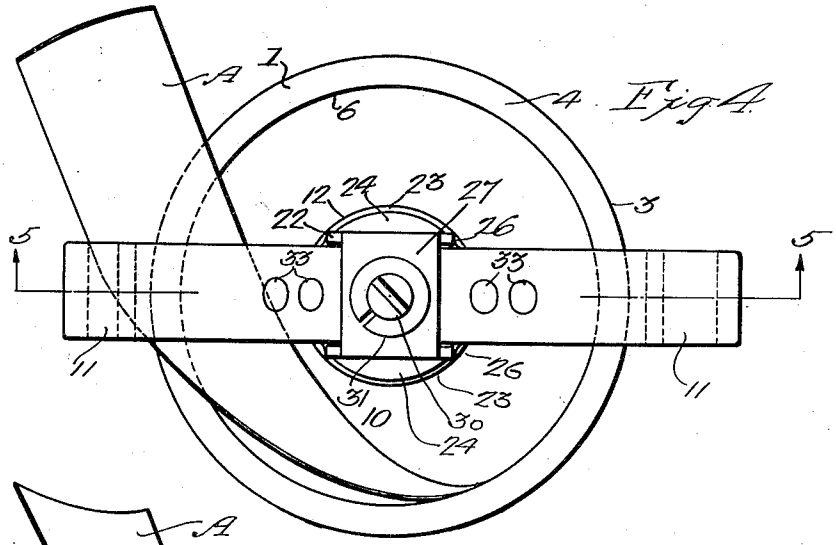


Fig. 4.

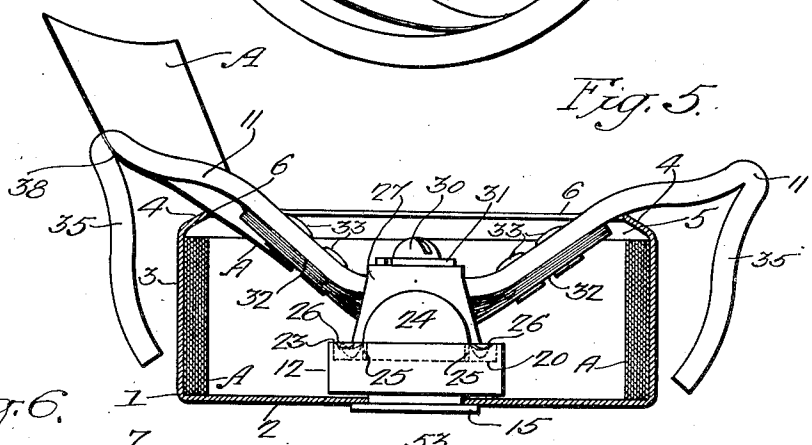


Fig. 5.

Fig. 6.

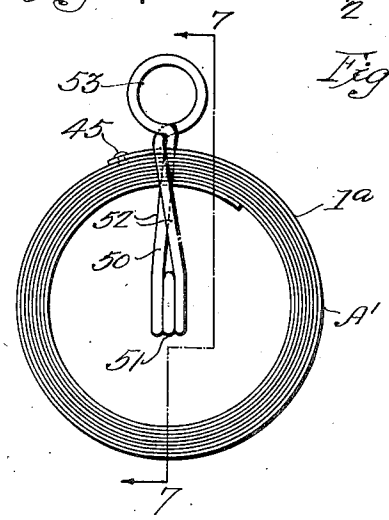
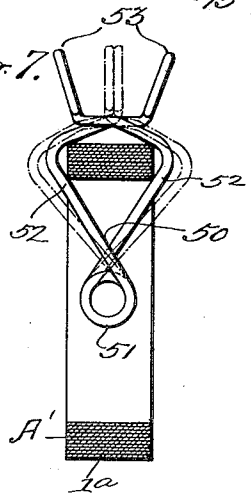


Fig. 7.



Inventor:
Hiram A. Farrand
by his Attorneys
Howson & Howson

March 31, 1931. H. A. FARRAND 1,799,094

MEANS FOR CONTROLLING RESILIENT RULES

Filed Oct. 5, 1928 4 Sheets-Sheet 3

Fig. 8

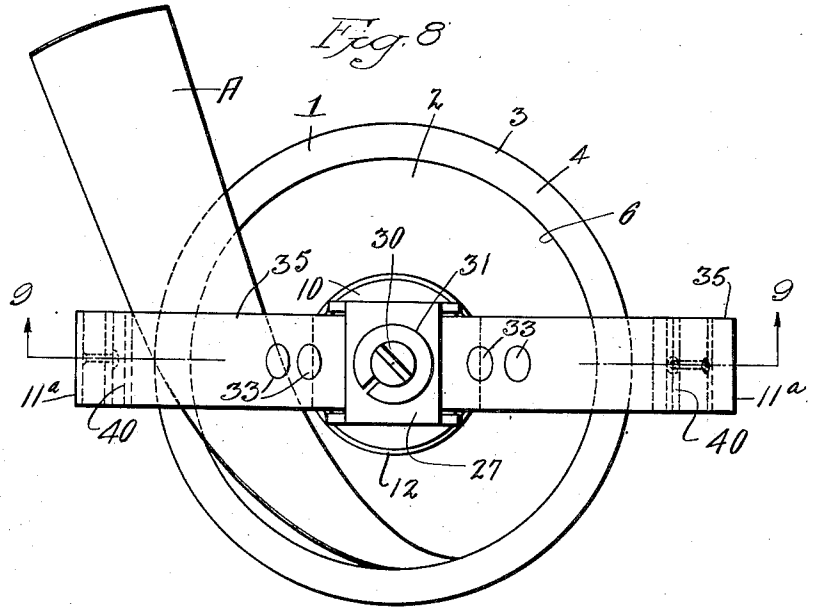


Fig. 9

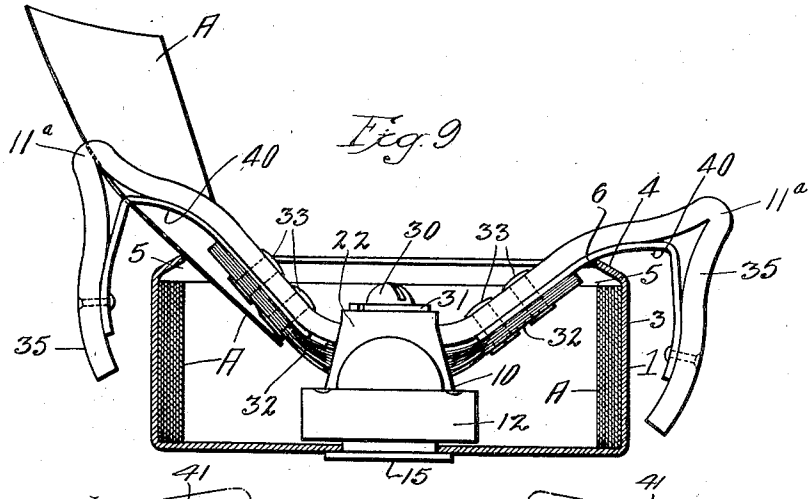
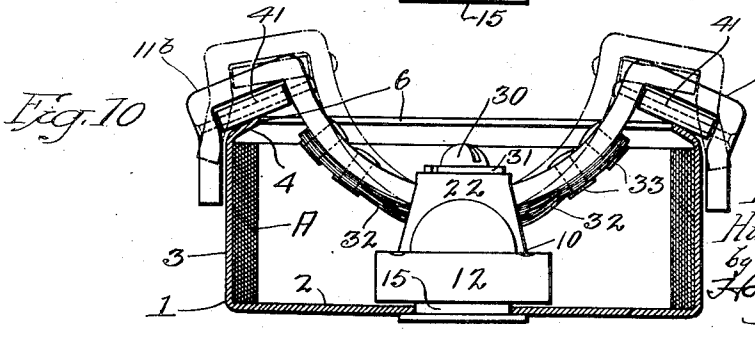


Fig. 10



Inventor:-
Hiram A. Farrand.
by his Attorneys.
Howson & Howson

March 31, 1931. H. A. FARRAND 1,799,094

MEANS FOR CONTROLLING RESILIENT RULES

Filed Oct. 5, 1928 4 Sheets-Sheet 4

Fig. 11

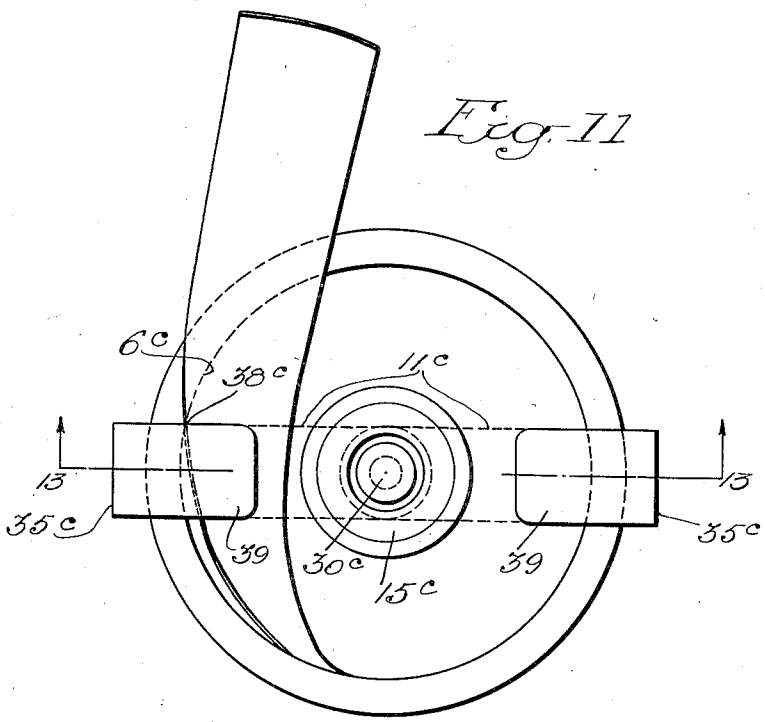


Fig. 13.

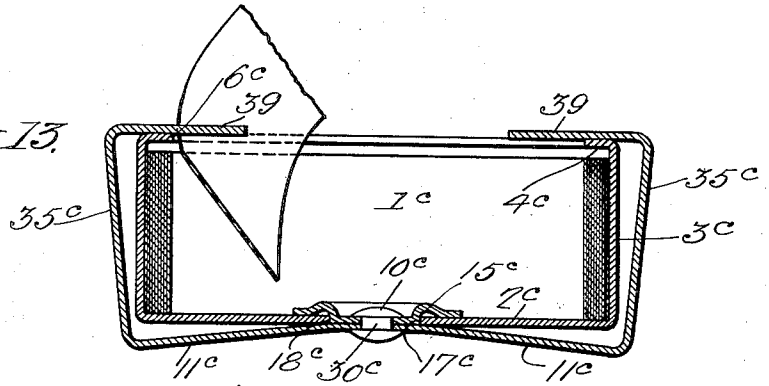
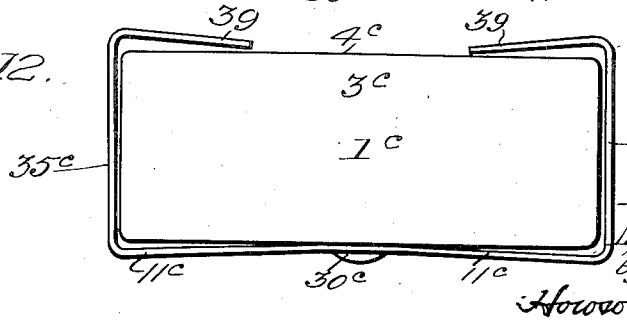


Fig. 12.



Inventor:
Hiaram A. Farrand
by his Attorneys.
Howson & Howson

Patented Mar. 31, 1931 1,799,094

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 October 5, 1928. Serial No. 310,578.

This invention relates to concavo-convex resilient rules, that it, 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. This construction produces a resilient rule which has an inherent tendency to assume, at all times, a rectilinear state, that is, the rule if unrestricted would extend itself into a straight rod-like form and the transverse cross-sectional curvature of the strip will maintain the rule in this straight condition.

The present invention relates to means for forming this type of resilient rule into a compact internally wound coil, that is, a coil in which each successively formed convolution lies within the previously formed convolution, the first convolution of the coil being formed within a suitable holder, preferably in the form of a cup.

The present invention relates particularly to means for controlling the movement of the rule as it is being either coiled or uncoiled, so that the rule may be projected from the holder to any desired extent and maintained in this projected state as long as desired.

The broad principle to be considered in the present application is the provision of a movable means which acts as a guide, for guiding the rule into and out of the coiled formation, and which also acts as a brake or retaining means, for holding the rule in its extended condition relative to the holder.

This movable combined guide and brake in the preferred form and in one of the modified forms of the invention is in the form of a lever which pivots about a point located substantially at the center of the coil and is movable in a plane substantially at right angles to the plane of rotation of the coil and its holder; and in another modified form of the invention the movable combined guide and brake is formed as part of, or is secured to, the holder and moves therewith in a plane parallel to the plane of rotation of the coil as it is being wound or unwound.

The present invention also relates to certain novel details of construction which will be fully disclosed hereinafter, reference being had to the accompanying drawings, of which:

Fig. 1 is a plan view of the preferred form of the invention, showing the rule in its fully coiled state within the holder;

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

Fig. 3 is a sectional elevation taken on the line 3—3 of Fig. 2;

Figs. 4 and 5 are views similar to Figs. 1 and 2, but showing the rule in a partially unwound condition with a portion of the rule extending out of the holder and the combined guide and brake acting to maintain the rule in this partially projected state, Fig. 5 being taken on a line 5—5 of Fig. 4;

Figs. 6 and 7 are respectively a side and sectional elevation of a modified form of the invention within the scope of the invention, Fig. 7 being taken on the line 7—7, Fig. 6;

Figs. 8 and 9 are views similar to Figs. 4 and 5 but showing an independent means for preventing the edge of the rule from wearing a groove in the guide member, Fig. 9 being a section on the line 9—9, Fig. 8;

Fig. 10 is still another form illustrating a movable wear-resisting member;

Figs. 11 and 12 are respectively a plan and side elevation of another modified form of the invention; and

Fig. 13 is a sectional elevation taken on the line 13—13, Fig. 11.

Referring to Figs. 1 to 5 inclusive, which illustrate the preferred form of the present invention, 1 is a holder for the rule A and is made in the form of a cup having a bottom 2, around the periphery of which is a circular flange or wall 3 extending 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 bottom 2.

As shown in Figs. 1, 2 and 3, the rule A, when completely wound into an internally wound coil, lies in successive convolutions within the holder or cup 1 and substantially within the circular pocket 5 defined by the inner edge 6 of the flange 4 and the circu-

lar wall 3, the first formed convolution of the coil lying in contact with said wall.

Mounted within and axially aligned with the cup 1 is a suitable pivot structure 10 in which one end of each of a pair of combined guide and brake arms 11 are pivotally mounted.

The pivot structure 10 comprises a ring 12 which is axially bored at 13 for the reception of the shank 14 of a stud 15, and counterbored at 16 for the reception of an enlarged head 17 of the stud 15, on which the cup 1 is rotatably mounted, the bottom 2 of the cup 1 being suitably apertured as at 18 to rotatably fit the head 17 of the stud, the said head having a circular lip 19 underlying the bottom 2 of the cup 1.

The ring 12 is provided with a circular concentric groove 20 which is adapted to receive the lower ends of legs 21, 21 of a bridge element 22.

Grooving of the ring 12, as at 20, forms a relatively narrow flange or wall 23 at the periphery of said ring and the legs 21, 21 are convexed as at 24 and notched as at 25 in order that the said legs will fit snugly against the inside of the flange 23.

The flange 23 is crimped inwardly, as shown at 26, at the opposite sides of the legs 21, 21, to form abutments to prevent relative rotary movement between the ring 12 and bridge element 22.

The upper ends of the legs 21, 21 of the bridge element 22 are integrally connected by a bridge piece 27 which lies substantially parallel to the plane of the ring 12.

The stud 15 is axially tapped and threaded at 28 to receive the threads of a tie screw 30 which passes through the bridge piece 27 and ties the ring 12, the bridge element 22 and the stud 15 rigidly together, a split lock-washer 31 being provided between the head of the screw and the bridge piece 27 to prevent the screw from becoming loose.

As shown in the drawings, the cup 1 is free to rotate on the pivot structure 10, the bottom 2 of the cup rotating on the stud 15, within a groove formed by the bottom of the ring 12 and the lip 19 on the stud, which prevents any appreciable amount of relative axial movement between the cup 1 and the pivot structure 10.

Each of the combined guide and brake levers or arms 11, 11 is provided with a plurality of relatively thin leaf springs 32. The series of springs 32 of each arm 11 are secured thereto, in the present instance, by rivets 33, 33, and each leaf of the assembled spring is provided with an opening 34 through which the tie screw 30 extends.

The leaves of the springs 32, 32 of the oppositely disposed arms 11, 11 are positioned in alternating relation to each other on and longitudinally of the screw 30, the bottom leaf of the two series lying in contact with the upper surface of the ring 12. By this means the arms 11 are held to the pivot structure 10 and are normally pressed into braking contact with the cup 1, as illustrated in Fig. 2, thus the cup 1 is held against rotation relative to the pivot structure 10.

To release the arms 11, 11 to permit rotation of the cup 1, the portions 35, 35 of the arms 11, 11 are pressed between the thumb and index finger, whereupon the arms will pivot on the edge 36 of the bridge piece 27 and thereby move away from the edge 6 of the flange 4 on the cup 1, in a plane substantially at right angles to the plane of rotation of the cup, permitting free rotation of the cup relative to the pivot structure 10 and the guide and brake arms 11.

The inner ends of the arms 11 are notched as indicated at 37, providing clearance for the screw 30 when the arms pivot on the edges 36 of the bridge piece 27, the inner ends of the said arms moving toward each other when the pivoting action occurs.

In order to partially or totally extend the rule A from the cup or holder 1 the free end of the rule, shown in Fig. 1, is raised out of the cup and permitted to lie over and against the edge 6 of the flange 4 thereof. Upon pressing the arms 11, as noted above, the end of the rule will assume the position shown in Fig. 4, with one of its edges resting in a seat or socket 38 formed at the point where the body of the arm 11 is bent to form the depending finger grip portion 35.

The inherent tendency of the rule to assume its rectilinear state, as above described, will cause the rule to extend itself out of the cup 1, one edge running against the guide socket 38 in the guide and brake arm 11, the body of the rule lying against the edge 6 of the flange 4 of the cup 1, as shown in Figs. 4 and 5.

When it is desired to arrest the movement of the rule out of the cup, the pressure on the arms 11, 11 is reduced, which permits the springs 32, 32 to move the arms toward the cup 1. The one arm which is acting to guide the rule will immediately press the body of the rule against the edge 6 of the flange 4, the opposite longitudinally edge of the rule contacting with the under side of the arm 11 as clearly shown in Fig. 5. The other arm 11 will assume the normal position shown in Fig. 5 in contact with the edge 6 of the flange 4, at the opposite side of the cup 1. While the arms 11, 11 remain in these positions further movement of the rule outward from the cup will be prevented.

In order to rewind the rule, into the internally wound coil within the cup, the extended portion of the rule is grasped by the fingers of the other hand, the arms 11, 11 pressed toward each other to release them from the rule and the cup, the rule is then moved longitudinally toward the cup, during which

the arm 11 will function to guide the rule into the cup, the socket 38 in the arm engaging the edge of the rule and the portion of the arm lying between the pivot structure 10 and the socket 38 being inclined toward the ring 12 and engaging the body of the rule transversely of the rule, thereby directing it into the circular pocket 5. Reduction of the pressure on the arms 11 will then permit the springs 32 to cause the arms to engage the cup and the rule as above noted, whereupon the free end of the rule can be replaced within the coil in the cup in the manner shown in Figs. 1, 2 and 3.

In order to prevent the arms 11 from becoming grooved or worn by the edge of the rule, I prefer to subject, at least those portions which come into actual moving contact with the edge of the rule A, to a hardening process, wherein these portions of the arms are made at least as hard as the rule, whereby wear and grooving are prevented.

In Figs. 8, 9 and 10, I have shown wear members independent of but carried by the arms 11. In Figs. 8 and 9, the independent wear members consist of hardened steel plates 40 secured to the under side of the arms 11*a*. In Fig. 10, I have shown rollers 41, 41 rotatably mounted in the arms 11*b*, 11*b*, which when the arms are pressed toward each other, as indicated in broken lines Fig. 10, will permit the rule to run free, the edge of the rule engaging one of the rollers 41. When the arms are released, the rule, when partially projected from the cup 1, will assume the same general position, relative to the arm and the cup, as that illustrated in Fig. 2 or 5 in which the arm, pressing against the edges of the rule, and the flange of the cup, pressing against the body of the rule intermediate its edges, will tend to bend the rule in the opposite direction to its natural or preset curvature, which will create sufficient friction between the rule and the elements with which it engages to arrest the rule in its movement and thereby retain it in the state to which it has been allowed to project itself relative to the cup.

In Figs. 6 and 7, I have shown a modified form of the invention in which the holder 1*a* is formed as an integral part of the rule strip, i. e. by bending one end of the rule strip A^1 into the form of a circle and securing the bent end to the body of the rule strip by any suitable means, such as the rivet 45. While the holder 1*a* in this instance is formed as an integral part of the rule strip its function is the same as the independent holder shown in Figs. 1 to 5 and acts in the same manner as the structure shown in Figs. 1 to 5 should the end of the rule strip be secured to the circular wall 3 of the holder shown in Figs. 1 to 5, i. e. in either case the holder provides a circular wall against the inner face of which the first or outermost convolution of the coil proper is laid during the coiling operation. In this form of the invention, the guide for the strip, in its movement into or out of the coil formed within the holder 1*a*, is in the form of a hardened spring wire 50, coiled at its center as shown at 51, and its opposite ends projecting from the coil in the form of arms 52 which act in the same general capacity as the arms 11 before described.

The arms 52, 52 extend laterally of and around the closely packed convolutions at one side of the coil and engage the opposite edges of both the inner convolution of the coil and the outer convolution thereof, which latter forms the holder for the coil.

The ends of the arms 52, 52 are bent to form finger grips 53, 53, which when they are pressed toward each other will cause the arms 52, 52 to be moved away from the coil in the manner shown in broken lines in Fig. 7, thus, if the end of the rule strip forming the inner convolution of the coil be drawn out laterally from within the coil, the rule will be permitted to extend itself and assume its rectilinear state. When the desired extent of projection of the rule has been reached, release of the pressure on the finger grips 53, 53 will permit the arms 52, 52 to again move toward and engage the side edges of the coil, thereby stopping the movement of the rule outward from the coil and holder. Rewinding of the coil may be effected in the same general manner as above described.

Figs. 11, 12 and 13 illustrate another form of the invention which is somewhat similar to the structure shown in Figs. 8 and 9, except that no ratchet teeth are provided on the inturned flange at the upper edge of the circular wall of the holder and the edge of the rule in moving into and out of the coil rests in a pocket formed between the edge of the said inturned flange and one edge of the combined guide and brake member.

Referring to Figs. 11 to 13 in detail, the circular wall 3*c* of the holder or cup 1*c* is provided with an inturned flange 4*c* which is substantially parallel to the bottom 2*c* of the cup. A pivot structure 10*c* is provided at the center of the cup and comprises a plate 15*c* having a circular portion 17*c* extending through an opening 18*c* in the bottom 2*c*. Arms 11*c*, 11*c* of the combined guide and brake element extend radially in diametrically opposite directions from the plate 15*c* along the under side of the bottom 2*c* of the cup and a rivet 30*c* passes through the plate 15*c* and the guide-brake element 11*c*, whereby the cup 1*c* is rotatably supported on the pivot structure 10*c*.

The arms 11*c*, 11*c* are provided with finger grips 35*c* which extend upwardly adjacent the cylindrical wall 3*c* and are provided with inturned extensions 39, which are adapted to bear against the flat upper surface of the flange 4*c*, thus preventing relative rotation

between the cup and the brake-guide member.

As shown in Fig. 11 the inner edge 6*c* of the flange 4*c* and one edge of the inturned extension 39 co-operate to form the pocket 38*c* in which one edge of the rule runs when moving into and out of the coil.

Operation of this form of mechanism is substantially the same as that of the form shown in Figs. 1 to 5. Pressing the finger grips 35*c*, 35*c* from the normal position shown in Fig. 13 toward the wall 3*c* of the cup will release the portions 39 from the flange 4*c*, as shown in Fig. 12, which permits the cup to rotate freely about its pivot 17*c*.

The brake-guide member is formed of a resilient or springy material so that when released it will move into the normal position shown in Fig. 13, with the portions 39 frictionally bearing on the flat face of the flange 4*c*.

I claim:

1. In combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state when coiled or in other than a rectilinear state, a coil holder having a circular wall, and a guide positioned adjacent said circular wall, said guide being movable with respect to the coil and the holder in a plane disposed at an angle to the plane of rotation of the coil, said guide co-operating with said circular wall to effect reduction of said rule into an internally wound coil within said holder, when said rule is moved longitudinally toward said holder, said coil having a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of said circular wall of the holder.

2. In combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state when coiled or in other than a rectilinear state, a coil holder having a circular wall, and a guide positioned adjacent said circular wall, said guide being movable with respect to the coil and the holder in a plane disposed at an angle to the plane of rotation of the coil, said guide co-operating with said circular wall to effect reduction of said rule into an internally wound coil within said holder, when said rule is moved longitudinally toward said holder, said coil having a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of said circular wall of the holder, said guide being arranged to pivot about a point located substantially at the center of rotation of the coil.

3. In combination with a concavo-convex rule element having an inherent tendency to assume a rectilinear state, a holder element having a circular wall, and a combined guide and brake element disposed adjacent said circular wall and adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when said rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of said circular wall, and means for moving said combined guide and brake member toward said wall and the coil retained thereby and into contact with one of said elements for arresting the movement of the rule relative to the holder against said inherent tendency which effects the unwinding of the rule from the coil.

4. In combination with a concavo-convex rule element having an inherent tendency to assume a rectilinear state, a holder element having a circular wall, a combined guide and brake element disposed adjacent said circular wall and adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when said rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of said circular wall, means for moving said combined guide and brake member toward said wall and the coil retained thereby and into contact with one of said elements for arresting the movement of the rule relative to the holder against said inherent tendency which effects the unwinding of the rule from the coil, and means for preventing wearing of the guide-brake member by the rule in its movement into and out of the coil.

5. In combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state, a holder comprising a cup having a bottom and a circular side wall, a pivot structure on which said holder is rotatably mounted comprising a stud extending through the bottom of said holder, a movable combined guide and brake member disposed adjacent said circular wall and pivotally mounted on said pivot structure, said guide-brake member being adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when said rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of said circular wall, and means for moving said guide-brake member toward said circular wall and the coil retained thereby, said guide-brake member being adapted to engage one of the last said pair of elements for arresting the rule in its movement relative to the holder against the said inherent tendency of the rule which effects unwinding thereof.

6. In combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state, a holder comprising a cup having a bottom and a circular side wall, a pivot structure on which said holder is ro-

tatably mounted comprising a stud extending through the bottom of said holder, a movable combined guide and brake member disposed adjacent said circular wall and pivotally mounted on said pivot structure, said guide-brake member being adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when said rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of said circular wall, and means for moving said guide-brake member toward said circular wall and the coil retained thereby, said guide-brake member being adapted to engage one of the last said pair of elements for arresting the rule in its movement relative to the holder against the said inherent tendency of the rule which effects unwinding thereof, said means comprising a spring member secured at one end to the said guide-brake member and having its opposite end engaging said pivot structure.

7. In combination with a concavo-convex rule element having an inherent tendency to assume a rectilinear state, a holder element comprising a cup having a bottom and a circular side wall, a pivot structure on which said holder is rotatably mounted comprising a stud extending through the bottom of said holder, a pair of movable combined guide and brake members disposed adjacent said circular wall and pivotally mounted on said pivot structure, said guide-brake members comprising arms extending in diametrically opposite directions from said pivot structure over the said circular wall, one of said guide-brake members being adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when the rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of the circular wall, and a spring member carried by each guide-brake member and having one end engaging said pivot structure, for moving said guide-brake members toward said circular wall and the coil retained thereby and into contact with one of said elements for arresting the rule against its movement under its said inherent tendency by which the rule is unwound from the coil.

8. In combination with a concavo-convex rule element having an inherent tendency to assume a rectilinear state, a holder element comprising a cup having a bottom and a circular side wall, a pivot structure on which said holder is rotatably mounted comprising a stud extending through the bottom of said holder, a pair of movable combined guide and brake members disposed adjacent said circular wall and pivotally mounted on said pivot structure, said guide-brake members comprising arms extending in diametrically opposite directions from said pivot structure and over the said circular wall, one of said guide-brake members being adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when the rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of the circular wall, a spring member carried by each guide-brake member and having one end engaging said pivot structure, for moving said guide-brake members toward said circular wall and the coil retained thereby and into contact with one of said elements for arresting the rule against its movement under its said inherent tendency by which the rule is unwound from the coil, and finger grips formed on the outer ends of said guide-brake members whereby said members may be operated to release the rule.

9. In combination with a concavo-convex rule element having an inherent tendency to assume a rectilinear state, a holder element comprising a cup having a bottom and a circular side wall, a pivot structure on which said holder is rotatably mounted comprising a stud extending through the bottom of said holder, a pair of movable combined guide and brake members disposed adjacent said circular wall and pivotally mounted on said pivot structure, said guide-brake members comprising arms extending in diametrically opposite directions from said pivot structure and over the said circular wall, one of said guide-brake members being adapted to co-operate with said circular wall to effect winding of said rule into an internally wound coil when the rule is moved longitudinally toward said holder, said coil comprising a plurality of convolutions laid one within the other with the outermost convolution lying against the inner face of the circular wall, a flat spring carried by each guide-brake member and having one end engaging said pivot structure, for moving said guide-brake members toward said circular wall and the coil retained thereby and into contact with one of said elements for arresting the rule against its movement under its said inherent tendency by which the rule is unwound from the coil, finger grips formed on the outer ends of said guide-brake members whereby said members may be operated to release the rule, and a wear-preventing element carried by each guide-brake member and adapted to be engaged by the edge of said rule.

10. The combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state when it is in other than a rectilinear position, of a holder having a bottom and a circular side wall extending substantially perpendicular thereto, an in-

turned flange on said side wall forming a pocket adapted to receive the rule in the form of an internally wound coil, a pivot structure on which said holder is rotatably mounted, combined guide and brake members pivotally mounted in said pivot structure and comprising arms extending in opposite directions from said pivot structure and overlying said flange and adapted to co-operate with said wall to form said rule into said coil when the rule is moved longitudinally toward the holder, and resilient means extending between and connected to said arms for moving said arms into contact with said flange for arresting the rule against movement out of the coil under its inherent tendency to assume a rectilinear state.

11. The combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state when it is in other than a rectilinear position, of a holder having a bottom and a circular side wall extending substantially perpendicular thereto, an inturned flange on said side wall forming a pocket adapted to receive the rule in the form of an internally wound coil, a pivot structure on which said holder is rotatably mounted, combined guide and brake members pivotally mounted in said pivot structure and comprising arms extending in opposite directions from said pivot structure and overlying said flange and adapted to co-operate with said wall to form said rule into said coil when the rule is moved longitudinally toward the holder, said arms being inclined from said pivot structure to a point beyond said flange and then bent at an acute angle in a plane substantially parallel to the said side wall, thereby forming a pocket to receive the edge of the rule and also forming finger grips by which the arms are actuated, and resilient means extending between and connected to said arms for moving said arms into contact with said flange for arresting the rule against movement out of the coil under its inherent tendency to assume a rectilinear state.

12. The combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state when it is in other than a rectilinear position, of a holder having a bottom and a circular side wall extending substantially perpendicular thereto, an inturned flange on said side wall forming a pocket adapted to receive the rule in the form of an internally wound coil, a pivot structure on which said holder is rotatably mounted comprising an annular element, a headed stud extending through the bottom of said holder into said annular member, a bridge member on said annular member, a tie screw passing axially through the bridge member and into the said stud, combined guide and brake members each comprising an arm having one end located within said bridge member and its opposite end overlying said flange and adapted to co-operate with the holder for reducing the rule into said coil when the rule is moved longitudinally toward the holder and to engage said flange to arrest the movement of the rule under its said inherent tendency, and a flat spring on each guide-brake member secured at one end to the guide-brake member and having its opposite end located within said bridge member and adapted to move the said guide-brake member into said braking contact with the flange, the latter said end of said spring having an aperture through which the said tie screw passes.

13. The combination with a concavo-convex rule having an inherent tendency to assume a rectilinear state when it is in other than a rectilinear position, of a holder having a bottom and a circular side wall extending substantially perpendicular thereto, an inturned flange on said side wall forming a pocket adapted to receive the rule in the form of an internally wound coil, a pivot structure on which said holder is rotatably mounted comprising a ring located adjacent the bottom of the holder, a stud extending through said bottom into said ring and having a head seated against said ring, a lip on said head overlying said bottom forming with said ring a groove in said pivot structure in which said holder bottom is mounted for free rotation relative to the pivot structure, a bridge element comprising legs seated in said ring and integrally connected at their opposite ends by a bridge piece spaced apart from said ring, a pair of combined guide and brake arms extending in opposite directions from said pivot structure and each having one end located in the space between the said ring and the said bridge piece and in pivotal contact with said bridge piece and their opposite ends overlying said flange and adapted to co-operate with the holder for reducing the rule into said coil when the rule is moved longitudinally toward the holder and to engage the flange to arrest the movement of the rule under its said inherent tendency, a tie screw passing through said bridge piece and secured in said stud, and a plurality of flat spring leaves on each guide-brake arm each having one end secured to said arm and the opposite end located in the said space between the ring and the bridge piece, these latter ends of the leaves of the springs of the opposed arms overlapping and alternating with each other along said tie screw, said leaves having apertures through which the said screw passes, said springs functioning to move the arms into said braking contact with the holder.

HIRAM A. FARRAND.