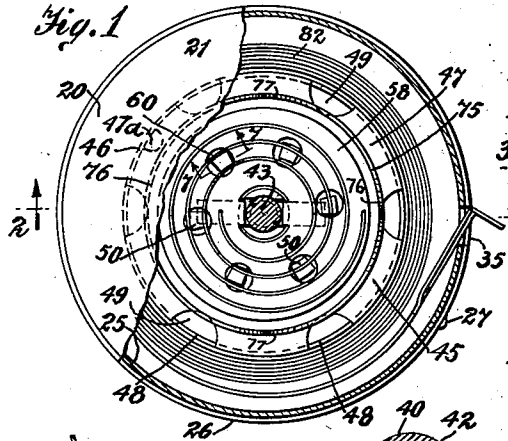
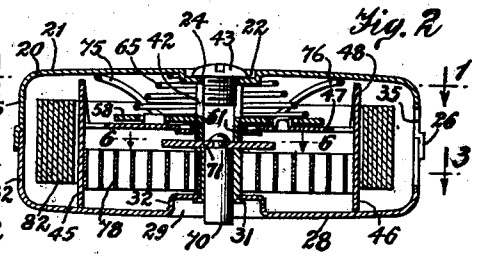
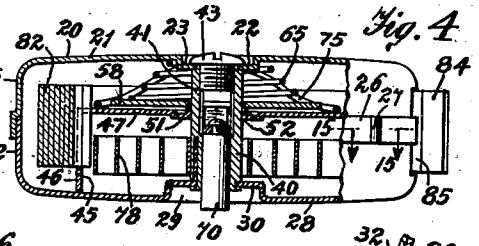
May 18, 1937. H. M. GASSTROM 2,080,815

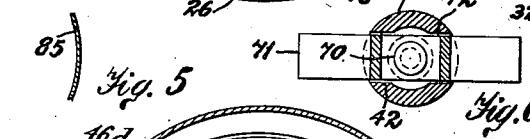
FLEXIBLE TAPE RULE

Filed June 22, 1935


Fig. 1


Fig. 2


Fig. 4


Fig. 5 Fig. 6

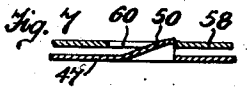
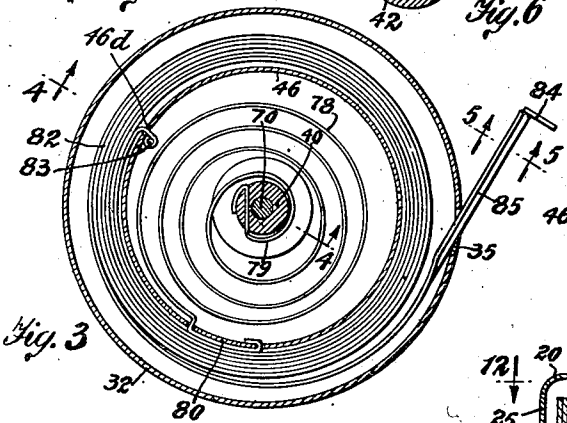
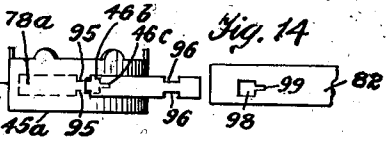
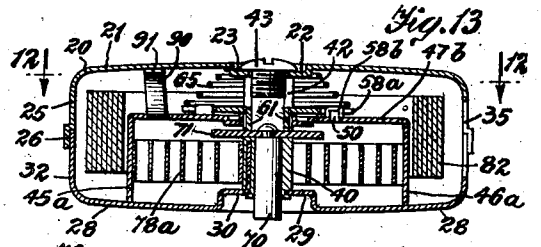
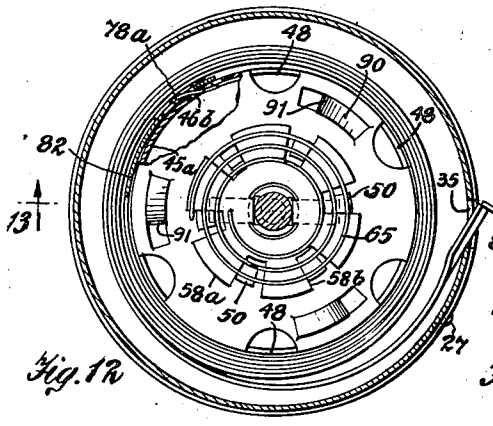

Fig. 7


Fig. 15


Fig. 3


Fig. 14


Fig. 13


Fig. 12

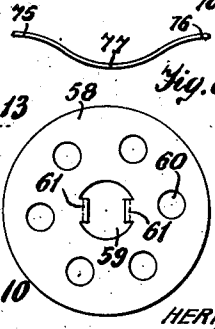

Fig. 10

Fig. 8 Fig. 9


Fig. 11

INVENTOR.
HERMAN M. GASSTROM
BY J. A. de Bonneville
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,080,815

FLEXIBLE TAPE RULE

Herman M. Gasstrom, Mount Vernon, N. Y.

Application June 22, 1935, Serial No. 27,864

3 Claims. (Cl. 33—138)

This invention relates to a flexible tape rule.

The object of the invention is the production of a flexible tape rule, which operates under the complete control of the user.

The second object of the invention is the production of a flexible tape rule, having means to automatically stop the travel of the tape of the rule when released.

The third object of the invention is the production of a flexible tape rule, the travel of which is under the tension of a spring to wind up the tape, with means to control the travel of the tape.

In the drawing Fig. 1 represents a partial top view of the flexible tape rule and section as on the line 1—1 of Fig. 2; Fig. 2 shows a section of Fig. 1 on the line 2—2; Fig. 3 indicates a section of Fig. 2 on the line 3—3; Fig. 4 represents a partial elevation of the rule and a section as on the line 4—4 of Fig. 3; Fig. 5 is a section of Fig. 4 on the line 5—5; Fig. 6 represents an enlarged section of Fig. 2 on the line 6—6; Fig. 7 shows an enlarged section of Fig. 1 on the line 7—7; Figs. 8 and 9 indicate elevations of a detail; Fig. 10 indicates a plan view of a detail; Fig. 11 is a section of Fig. 10 on the line 11—11; Fig. 12 is a section of Fig. 13 on the line 12—12, showing a modification; Fig. 13 shows a section of Fig. 12 on the line 13—13; Fig. 14 represents an elevation of modified details; and Fig. 15 represents a section of Fig. 4 on the line 15—15.

Referring to Figs. 1 to 11 inclusive and Fig. 15, the flexible tape rule comprises the case 20, having upper and lower cup shaped clamping members. The upper cup shaped clamping member of the case comprises the top wall 21 having the depending cylindrical pocket 22 with the wall 23 having the opening 24. The cylindrical wall of the top member of the case is indicated at 25 and is at practically right angles to the said top wall 21. The lower end portion of the wall 25 has integral therewith the off-set clamping collar 26 having the bulged out locking pocket 27. The lower cup shaped member of the case comprises the bottom wall 28 having the cylindrical shaped operating pocket 29 with the top wall 30 having the opening 31. The cylindrical wall of the lower member of the case 20 is shown at 32 having the locking projection 33, which detachably locks with the locking pocket 27. An opening 35 is indicated at the junction of the members of the case 20. The upper portion of the wall 32 is detachably seated in the collar 26.

A tubular post 40 extends up from the wall 30 of the pocket 29. The lower end of the post 40 is spun to said wall 30. The upper end of the post 40 bears against the wall 23 of the pocket 22. The post 40 at its upper portion 41 is somewhat enlarged in diameter and has formed therein a pair of longitudinal oppositely positioned guide openings 42. A screw 43 is in threaded engagement with the upper end of the post 40, to maintain the members of the case 20 in locked position.

A drum 45 is positioned within the case 20 and is journaled on the post 40. The lower end of the said drum bears upon the wall 28. The drum 45 comprises the cylindrical shell 46 having the opening 46a and the top wall 47 having the opening 47a. Extensions 48 are provided for the shell 46 and are formed from the top wall 47 leaving the openings 49. The top ends of the extensions are adjacent to and normally spaced from the top wall 21 of the upper member of the case 20, see Fig. 2.

The top wall 47 of the drum 45 has a plurality of ratchet projections 50 extending therefrom, and in the central portion of the wall 47 is formed the depressed portion 51 with the guide bar 52.

Upon the top wall 47 of the drum 45 is positioned the ratchet plate 58, which is indicated with the central opening 59 and the plurality of circular locking openings 60, having their centers disposed in a circle coaxial with the opening 59. The locking openings 60 are disposed to lock with the ratchet projections 50. Depending projections 61 extend down from the plate 58 into the opening 59. The projections 61 extend into and are guided in the guide openings 42 of the post 40. A conical shaped spiral spring 65 bears between the ratchet plate 58 and the top wall 21 of the upper member of the case 20, to maintain the plate 58 in operative position with the ratchet projections 50.

A push pin 70 is slidably positioned in the lower portion of the post 40 and has connected thereto the adjusting bar 71, which extends through the guide openings 42 of said post 40. The adjusting bar 71 bears up against the lower ends of the projections 61 of the ratchet plate 58. The user of the rule can push up the pin 70, and thereby lift the ratchet plate 58 to clear its locking openings 60 from the locking projections 50, and can then contact the extensions 48 with the wall 21 to function as a brake.

A wire spring 75 with the pair of oppositely positioned curved upper members 76 and a pair of oppositely positioned curved lower members

77, bears between the wall 47 of the drum 45 and the top wall 21 of the upper member 20 of the case, to maintain the drum in operative position and functions as a brake when the flexible tape to be described returns into the case 20.

A flat spiral spring 78 is positioned within the drum 45 and has its inner end 79 connected to the lower portion of the post 40, and its outer end 80 is connected to the shell 46 of said drum 45.

A flexible tape 82 having the usual divisions lines and numerals thereon or other suitable scales, has its inner end 83 connected to the shell 46 of the drum 45 extending through the openings 46*d* and 47*a*, and its outer end leads through the opening 35 of the case 20. A hook 84 is indicated at the outer end of the tape 82. The said tape 82 when uncoiled and out of the case 20 is concavo-convex in cross-section, as indicated at 85, Figs. 3 and 5, but when coiled in the drum 20 is flexible enough to assume a cross-section which is flat as shown in the drawings.

Referring to Figs. 12, 13, and 14, which comprises a modification of the flexible tape rule, the case for the rule is again indicated at 20. The top wall of the upper member of the case is again shown at 21, with its pocket 22 having the wall 23. The cylindrical wall of the top member of the case is again shown at 25 with its offset clamping collar 26 having a bulged out locking pocket, not shown, similar to 27. The bottom wall of the lower member of the case is again indicated at 28, with its operating pocket 29 having the top wall 30. The cylindrical wall of the lower member of the case is again indicated at 32, which has a bulged out locking projection, not shown, similar to 33. The opening for the case 20 is again indicated at 35. The post 40 is again shown with the guide openings 42 and the screw 43. The drum of the rule is indicated at 45*a* having the cylindrical shell 46*a* with the opening 46*b*, having the extension 46*c* and the top wall 47*b*. Extensions 48 again extend from the drum 45*a*. The top wall 47*b* has integral therewith and pressed out from said top wall, the flexible brake arms 90 with the brake shoes 91. The latter bear against the inner face of the top wall 21 of the upper member of the case 20. The brake arms 90 with their shoes 91 are substituted for the wire spring 75. The extensions 48 in this modification may be omitted. Ratchet projections 50 again extend from the top wall 47*b*. The ratchet plate is indicated at 58*a* having the radial ratchet openings 58*b*. The projections of the ratchet plate are again shown at 61. The conical shaped spiral spring is again indicated 65. The push pin is again shown at 70 with its adjusting bar 71.

The flat spiral spring is indicated at 78*a* and has its inner end connected to the post 40, as already described. The spring 78*a* at its outer end portion has indicated the similar pairs of recesses 95 and 96 extending from its top and bottom edges. The recesses 95 are detachably locked with the top and bottom edges of the opening 46*b* of the drum 45*a* and the recesses 96 are without said drum. The flexible tape 82 in this modification has indicated in its inner end the opening 98 with the extension 99. The outer end of the spring 78*a* is detachably locked to the tape 82, by inserting said outer end through the opening 98 of the tape 82, and locking the spring 78*a* with said tape by means of the recesses 96.

Referring to Figs. 1 to 11 inclusive and Fig. 15, the flexible tape rule when not in use is enclosed in its case 20, as indicated in the drawing. When the tape 82 is to be used, the user pulls it out of its case 20 by grasping the hook 84 and as soon as it projects out of the opening 35, it assumes its normal concavo convex shape 85 as indicated in Fig. 5. The tape 82 is pulled out against the tension of the spring 78 and when being pulled out winds up the said spring 78. While the tape 82 is being pulled out of the case 20 the tension of the wire spring 75 bearing between the wall 21 of the upper member of the case 20 and the top wall 47 of the drum 45, is light enough to permit said drum 45 to rotate while the tape 82 is withdrawn. While the tape 82 is withdrawn from the case 20 the ratchet plate 58 rides over the ratchet projections 50 in the top wall 47 of the drum 45. The coaction of the said ratchet projections 50 and the ratchet plate, hold the tape in place if for any reason the operator releases it. When the tape 82 is sufficiently withdrawn to measure the desired distance, the concavo-convex feature thereof maintains the tape stiff and straight, to be enabled to take measurements in vertical, horizontal or inclined positions. After the desired measurements have been made with the tape 82, the use bears on the push pin 70, which raises and disengages the ratchet plate 58 from the ratchet projections 50, and the tension of the flat spiral spring 78 pulls the tape 82 into the case 20, overcoming the tension of the spring 75. The latter functions as a brake to secure an easy entrance of the tape 82 into the case, and avoids injury to the tape and the user, should the tape be accidentally released.

When the user forces the push pin 70 a little further into the post 40, the adjusting bar 71 bears against the depressed portion 51 of the drum 45, and thereby the ends of the projections 48 of said drum bear against the inner face of the top wall 21 of the upper member of the case 20, and also function as a brake.

It will be noted that by reason of the function of the projections 48 the wire spring 75 could be eliminated.

The operation of the tape indicated in Figs. 12 to 14 is essentially, as already described for the other figures, with the exception that the spring 75 is eliminated, and the brake shoes 91 bear against the wall 21 of the top member of the case 20, and control the speed of the travel of the tape. The ratchet projections 50 function with the radial openings 58*b* of the ratchet plate 58*a*.

Various modifications may be made in the invention and the present exemplification is to be taken as illustrative and not limitative thereof.

Having described my invention, I claim:

1. In a flexible tape rule the combination of a case, a drum journaled in the case, extensions extending from the drum having their top ends normally spaced from the top wall of the case, a spring in the case having one end fixed therein and its other end connected to said drum, a flexible tape with a scale thereon having its inner end connected to said drum and its outer end extending through an opening in said case, said tape when withdrawn from the case being under the tension of the spring, intermittent interlocking means for the drum when it is turned, means to detach said interlocking means and the latter means also functioning to force the extensions of the drums to the top wall of the case to operate as a brake.

2. In a flexible tape rule the combination of a case, a drum journaled in the case, a post in the case, a cylindrical shell for the drum having an opening with an extension journaled on said post,

a spring interposed between the post and the drum, the outer end of said spring extending through the opening of said drum and having recesses detachably locked with the opening in the drum, said portion of the spring on the outside of said drum having a second pair of recesses and a flexible tape having a scale thereon and an opening with an extension at its inner end, the outer end of said spring detachably locked with the tape by engaging the second pair of recesses at its outer end with the opening in said tape.

3. In a flexible tape rule, the combination of a case comprising an upper and a lower cup shaped clamping member, said upper member comprising a cylindrical wall and a top wall, said lower member comprising a cylindrical wall and a bottom wall, a drum journaled in the case and comprising a cylindrical shell and a top wall, a wire spring having a pair of oppositely positioned curved upper members and a pair of oppositely positioned curved lower members, bearing between the top wall of the drum and the top wall of the upper member of the case, a spring in the case having one end fixed and its other end connected to the drum, a flexible tape with a scale thereon having its inner end connected to said drum and its other end extending through an opening in said case, intermittent interlocking means for the drum when it is turned and means to detach said interlocking means.

HERMAN M. GASSTROM.