

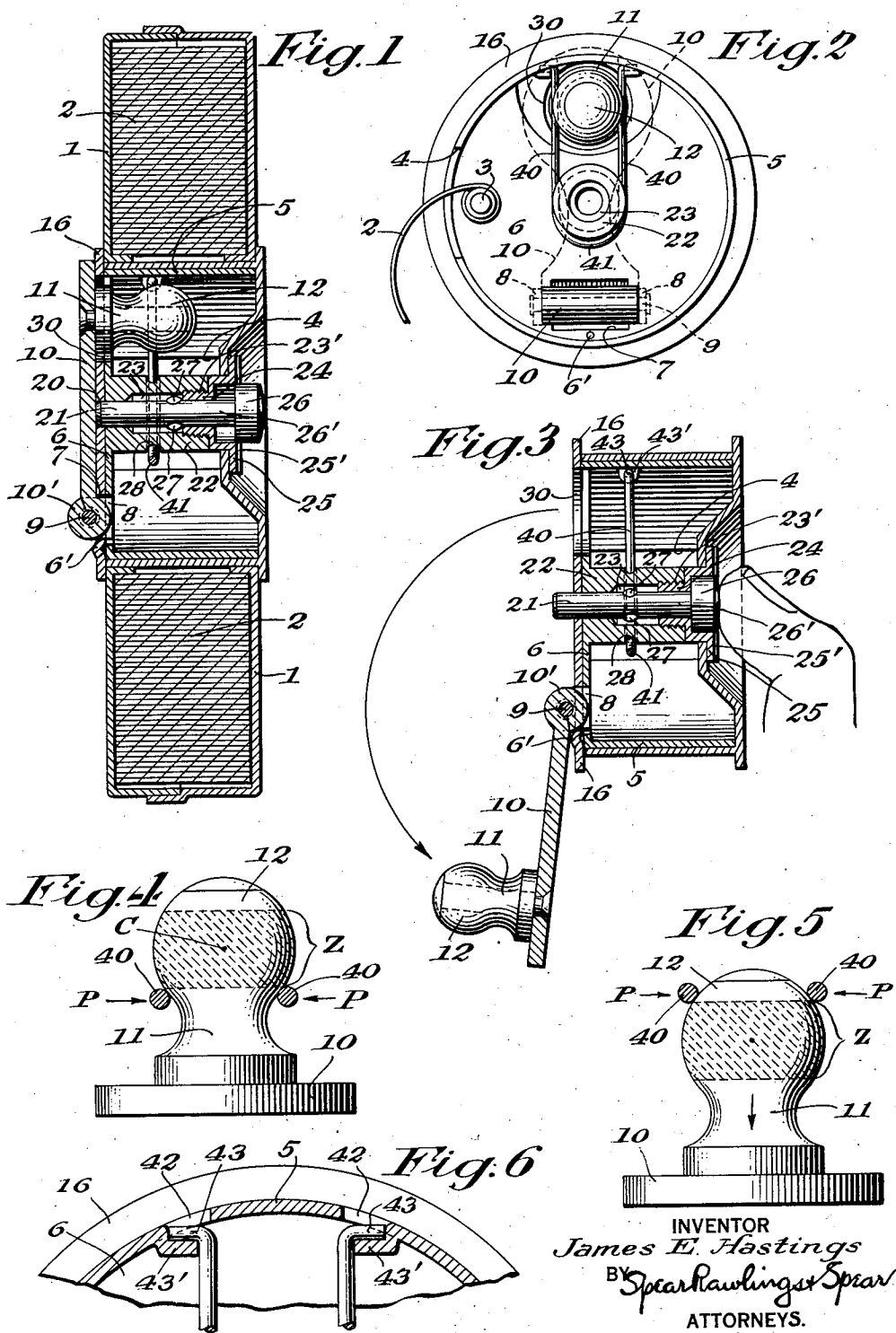
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TAPE REEL

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TAPE REEL

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This invention relates to the improvement of certain standard types of tape reels. While many of these have come on the market with a reputation for generally satisfactory service, I have conceived of a simple basis of improvement in performance, in economical basis of production, and in structural durability.

The tapes involved have folding winding handles released by a push button and it has been found highly important that these handles reach full operative position so that the user will have every facility for smooth winding, as kinking is serious particularly in steel tapes now so generally in use.

To get this handle action it was early provided for by springs as in Letters Patent No. 1,056,849, of March 25, 1913, to L. S. Starrett, which was and is a structure of practical serviceability, but like many others was expensive to produce.

My present invention involves a simplification by which a single spring is made to serve the functions of the plural spring combinations apparently thought necessary in the prior art.

As illustrative of my invention I have shown in the accompanying drawing a winding tape of simple standard type, but improved so that its single spring serves the double function of mild frictional retention of the folded handle and of vigorous unfolding expulsive action ready for use in winding. In the drawing:

Fig. 1 is a central vertical section through a tape case according to my invention.

Fig. 2 is a view of the open end of the drum shell of such a case removed from the casing.

Fig. 3 is a partial central section viewed from one side, the crank arm being in opened position.

Fig. 4 is a schematic study of the crank arm handle in the relation of its zones to the spring in the folded position of the crank arm, and illustrative of the holding pressures of the spring arms as indicated by arrows.

Fig. 5 is a similar view illustrating the expulsive component of the spring at the moment of handle release, as indicated by arrow, and

Fig. 6 is an enlarged fragmentary view of the drum hub sectioned to illustrate its spring anchorage.

Referring to Fig. 1 and 2 I have indicated in section a casing 1 of a measuring tape, a short length of the tape being indicated at 2 as attached to a pin 3 set opposite a notch 4 in the drum portion 5 of the winding shell. This shell has a flat outer face 6 which forms the end wall of the drum portion. A plate 16 is preferably

provided which forms the actual outer face 6 but might be formed as part of the drum. This face plate 16 is slotted at 7 from which ears 8 are upturned to form lateral bearings in which the pin 9 is fixed as the bearing axis for the cylindrically rolled end 10' of the flat winding crank arm 10.

The face plate 16 has a small stop 6' raised from its surface to receive the impact of the impinging portion of the crank arm 10 when it is thrown open to winding position.

At its free end the arm 10 carries the winding handle 11 on which is set a head 12. This feature will be discussed in detail later in this specification with its novel relation there explained. At its center the end wall 6 of the plate is apertured as at 20 through which the pin end 21 may be protruded to free the crank arm 10 for its opening swing. On the side diametrically opposite to the bearing of the crank arm in the ears 8 above described the plate forming the face 6 has a large aperture 30 through which the head of the winding handle may freely pass in its arc of movement in the opening and closing swing of the crank arm.

In practice the shell of the winding drum is formed as a cup of which the drum portion 5 constitutes a surrounding flange. The cup bottom on the face side is cut away under the slot 7 and the aperture 30 of the face plate 16. The vertical tape receiving pin 3 has its end upset to rivet it in place, the end being covered by the face plate 16. The hollow hub 22 is also carried by the cup bottom through which its central bore 23 opens so that the outer end 21 of the freeing pin passes to the surface of the face plate 6.

The bore of the hollow hub is internally threaded as at 23' to receive the externally threaded extension 24 of the disc 25 which is counterbored to receive the cylindrical button 26 carrying the shank 25'. This constitutes the main body for the pin end 21. The button 26 is stopped in its outward thrust by the bottom of the counterbore through the disc 25 and I strike up a pair of oppositely disposed stops 27 to limit the motion of the pin inwardly against a shoulder left in the central bore of the extension 24 on the disc 25'. The disc 25 is conveniently slotted as at 25' for engagement by a spanner for tightening up on the interengaging threads of the hub parts. The cylindrical hub 22 has a circumferential groove 28 adjacent its supporting end for laterally steadying the spring arms 40.

Applicant's spring for retaining the winding handle 11 may be a simple unitary member pref-

erably of bent wire with parallel arms 40 connected by the cross bend 41 which is conveniently disposed as a hub enclosing loop bearing laterally freely in the groove 28. At what may be called the open end of this unit the ends of its parallel arms 40 may be conveniently held in the drum wall which is pierced as at 42 to receive them, their tips 43 being bent into slight depressions 43' sunk in the surface of the drum wall. This leaves a smooth tape receiving surface on the exterior of the drum wall.

I will now discuss the head 12 on the handle 10 in its relation to my unitary spring element.

Considering the spherically contoured head 12 it will be observed by reference to the schematic showing of Figs. 4 and 5 that the effective part of its sphericity lies in a zone bracketed at Z. This zone may be considered as extending above and below the center of the head 12 for a distance which may vary somewhat according to the size and disposition of the spring arms 40.

The phase of operation illustrated in Fig. 4 is one in which the crank arm 10 is to be understood as folded down flat against the face of the shell with its head 12 within the case. In this position the opposite spring arms 40 are merely pressing towards each other in the direction of the arrows so as to gently but firmly grasp the head just beyond the zone Z to hold the arm 10 down flat and against accidental dislodgement or unfolding.

As presented in Fig. 5 the end 21 of the shank of the dislodging or freeing pin is supposed to have lifted the arm 10 slightly so as to cause the head 12 to crowd between the arms 40 springing them apart.

As the head 12 continues to so move, its center C quickly passes the plane of pressures indicated by arrows as at P—P. At that moment the spring arms assume an expulsive authority and progressively pressing on that part of the zone Z below its center. It thus imparts to the head and pivoted arm an expulsive impulse which is followed in each successive plane of the zone Z with a continuously augmented wedging effect until the head 12 is expelled through the entrance aperture 30 with a force sufficient to impel the arm 10 to its wide open position in contact with the stop 6'. In this position the arm 10 is reversed on its pivot pin 9 and the handle 12 presented in position for convenient and efficient grasping.

According to my invention but a single spring need be employed as it is so disposed as to have the double function of frictional retention of the handle head when in folded position and of its smart ejection when the head is freed from its retentive grip by a push pin or other trigger-like releasing means.

While the form shown is highly efficient and makes possible highly desirable manufacturing economies the figure of the spring might be varied or made as two separate arms all within the teachings of this application.

Further while I am aware that tape cases having a push button release for a folded winding handle in a depression in the opposite side were old, as shown in the earlier patent to L. S. Starrett of 1913, my construction provides a new and improved combination of hub parts and their assembly and an improved basis of installation in such tapes.

What I therefore claim and desire to secure by Letters Patent is:

1. In a tape reel having a cylindrical enclos-

ing casing, a shell including a cylindrical tape supporting drum, and a flat outer face, and disposable axially in a casing, a hub centrally of said drum and face and having an axial bore emergent through the face, a push pin loosely held in said bore and protrudable at one end through the face of the drum, a crank arm pivoted to the drum face at one side of said pin axis, a handle, a head thereon having a spherical zone supported vertically above the surface of the free end of said crank, said shell face having a handle receiving aperture opposite the crank pivot, a unitary forked handle retaining spring supported at its open ends in the drum wall and enclosing said hub, the arms of said spring extending outwardly of the drum in substantially parallel planes secant to the handle receiving aperture and spaced apart a distance slightly less than the diameter of the sphericity of the handle head so as to be yieldingly receptive to said head to lock it frictionally within the shell and expulsively effective past the plane of the horizontal axis of the sphericity of the head when the handle is so moved by the emerging end of the push pin to cause said handle to fly open radially across the face of the drum.

2. In a tape reel having a cylindrical enclosing casing, a shell including a cylindrical tape supporting drum, and a flat outer face, and disposable axially in a casing, a hub centrally of said drum and face and having an axial bore emergent through the face, a push pin loosely held in said bore and protrudable at one end through the face of the drum, a crank arm pivoted to the drum face at one side of said pin axis, a handle, a head thereon having a spherical zone supported vertically above the surface of the free end of said crank, said shell face having a handle receiving aperture opposite the crank pivot, a bent wire handle retaining spring supported at one end in the drum wall and enclosing said hub, said hub having a peripheral groove freely supporting the spring loop, the arms of said spring extending outwardly of the drum in substantially parallel planes secant to the handle receiving aperture and spaced apart a distance slightly less than the diameter of the sphericity of the handle head so as to be yieldingly receptive to said head to lock it frictionally within the shell and expulsively effective past the plane of the horizontal axis of the sphericity of the head when the handle is so moved by the emerging end of the push pin to cause said handle to fly open radially across the face of the drum.

3. In a tape reel, a casing, a drum in said casing having a peripheral wall and a flat outer face, a foldable crank arm pivoted at one end to said drum face, a spherical head extending laterally from the surface of the free end of said crank arm, said drum face being apertured to permit the passage of said head, a spring mounted in the peripheral wall of the drum and including coacting parallel members of relatively small cross section disposed in the path of movement of said spherical head so as progressively to contact it on opposite sides above and below its center whereby said head may be retentively held in said drum when said crank arm is in its folded position, and means releasing said head from between said parallel members, the recoil of said members when released expulsively ejecting said crank arm outwardly to lie flat upon said casing with said head presented for manual engagement.

4. In a tape reel, a casing, a drum in said cas-

ing having a peripheral wall, a foldable crank arm pivoted at one end to said drum, a handle on the other end of said arm and having a spherical zone spaced from the surface of the free end of said crank arm, said drum being apertured to permit the passage of said head, a handle contacting spring mounted in said drum wall including coacting parallel members spaced apart slightly less than the diameter of said spherical zone and of relatively small cross section disposed in the path of movement of said spherical zone of said head so as progressively to contact it on opposite sides above and below its center, whereby said head may be retentively gripped when in its folded position in said drum and expulsively ejected from between said parallel members when its center of zonal sphericity is moved past the plane of their coactive influence.

5. In a tape reel having a cylindrical enclosing casing, a shell including a cylindrical tape supporting drum, and a flat outer face, and disposable axially in a casing, a hub centrally of said drum and face and having an axial bore emerg-

ent through the face, a push pin loosely held in said bore and protrudable at one end through the face of the drum, a crank arm pivoted to the drum face at one side of said pin axis, a handle, a head thereon having a spherical zone supported vertically above the surface of the free end of said crank, said shell face having a handle receiving aperture opposite the crank pivot, a bent wire handle retaining spring supported at one end in the drum wall and enclosing said hub, the arms of said spring extending outwardly of the drum in substantially parallel planes secant to the handle receiving aperture and spaced apart a distance slightly less than the diameter of the sphericity of the handle head so as to be yieldingly receptive to said head to lock it frictionally within the shell and expulsively effective past the plane of the horizontal axis of the sphericity of the head when the handle is so moved by the emerging end of the push pin to cause said handle to fly open radially across the face of the drum.

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