United States Patent

Stangarone et al.

[15] **3,675,615**

[45] **July 11, 1972**

[54] AUTOMATIC FLAGPOLE

[72] Inventors: **Gene Stangarone**, Thornton; **Frank A. Cassara**, Chicago; **Eugene F. Dupont**, Toluca, all of Ill.

[73] Assignee: **Automatic Flag Poles, Inc.**

[22] Filed: **Dec. 1, 1970**

[21] Appl. No.: **94,080**

[52] **U.S. Cl.** **116/173**, 187/20

[51] **Int. Cl.** **G09f 17/00**

[58] **Field of Search** 116/173, 174, 175; 254/134.3, 254/189; 187/20

[56] **References Cited**

UNITED STATES PATENTS

1,373,376	3/1921	Zipoy	116/173
1,645,645	10/1927	Davis	116/173
2,507,623	5/1950	Diaz	116/174
2,530,654	11/1950	Ellis	116/173
2,630,779	3/1953	Mader	116/173
3,300,185	1/1967	Metzger et al.	254/134.3
3,417,732	12/1968	Platt, Jr.	116/173
3,418,967	12/1968	Donkersloot	116/173

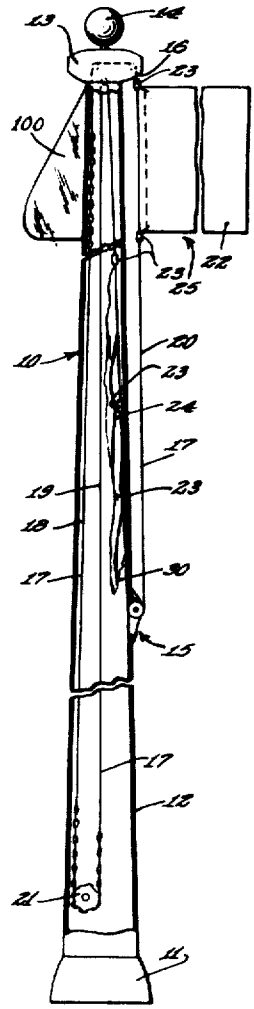
Primary Examiner—Louis J. Capozi

Attorney—Hill, Sherman, Meroni, Gross & Simpson

[57] **ABSTRACT**

An automatic flagpole which has a hollow interior in which the flag is stored and which has a continuous halyard and a driving mechanism for moving the halyard. The flagpole has a halyard exit at the top thereof and a lanyard entrance intermediate the length of the pole large enough to allow entrance of the flag whereby the flag may be drawn into the interior of the pole for storage, the halyard having an inboard reach interior of the pole extending from the midpoint entrance to a sheave mechanism atop the pole so that the flag is stored interiorly of the pole above the midpoint entrance.

4 Claims, 11 Drawing Figures



PATENTED JUL 11 1972

3,675,615

SHEET 1 OF 3

Fig. 1

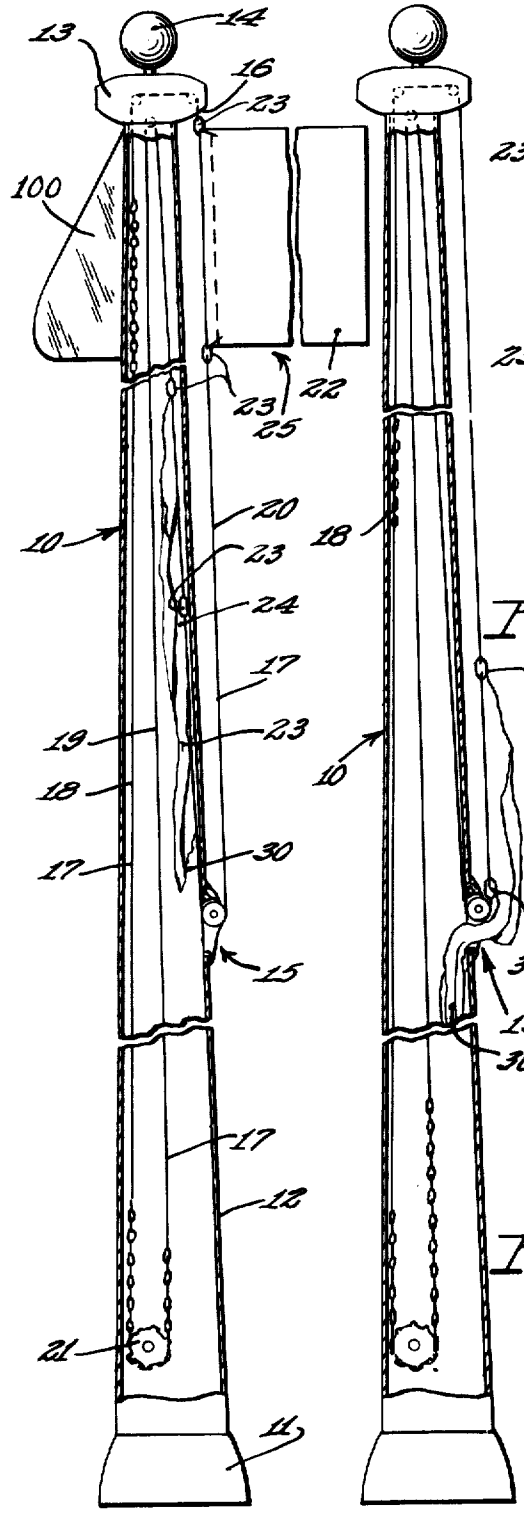


Fig. 2

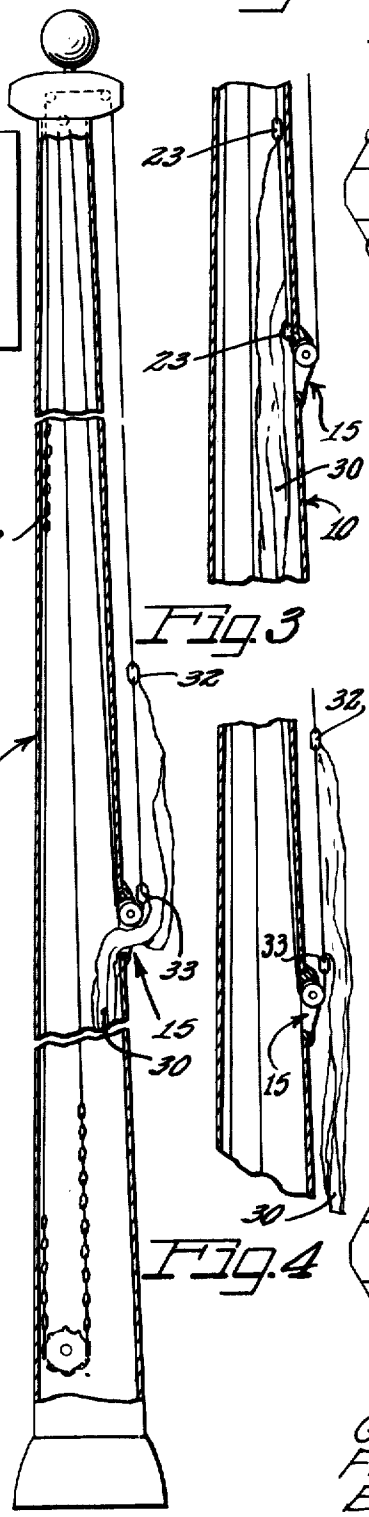


Fig. 3

Fig. 5

Fig. 4

INVENTORS
Gene Stangarone
Frank A. Cassara
Eugene F. DuPont

BY Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

Fig. 6

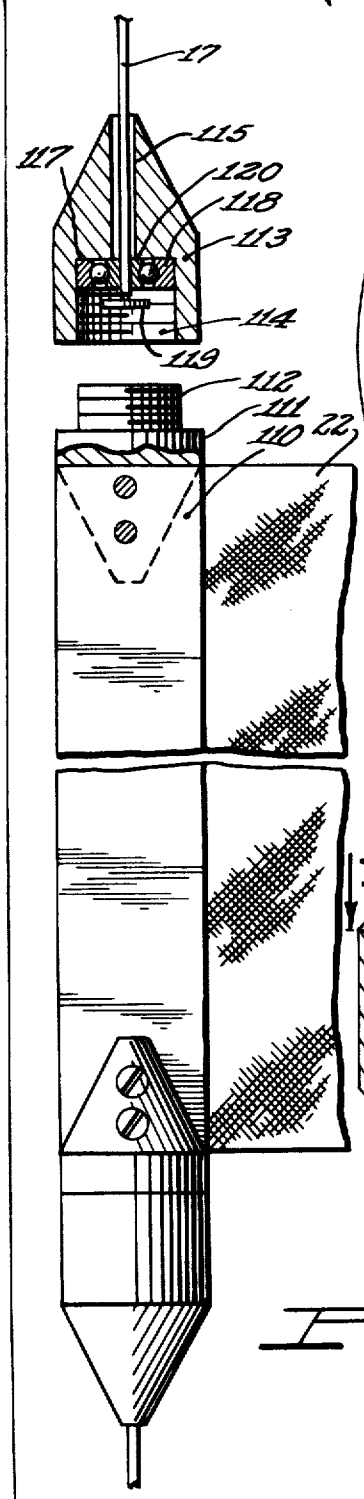
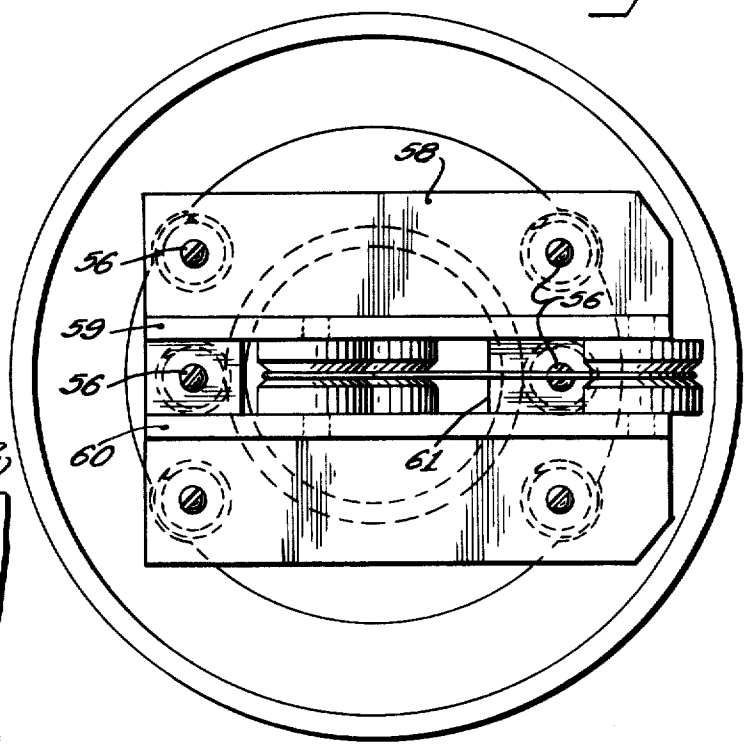


Fig. 8



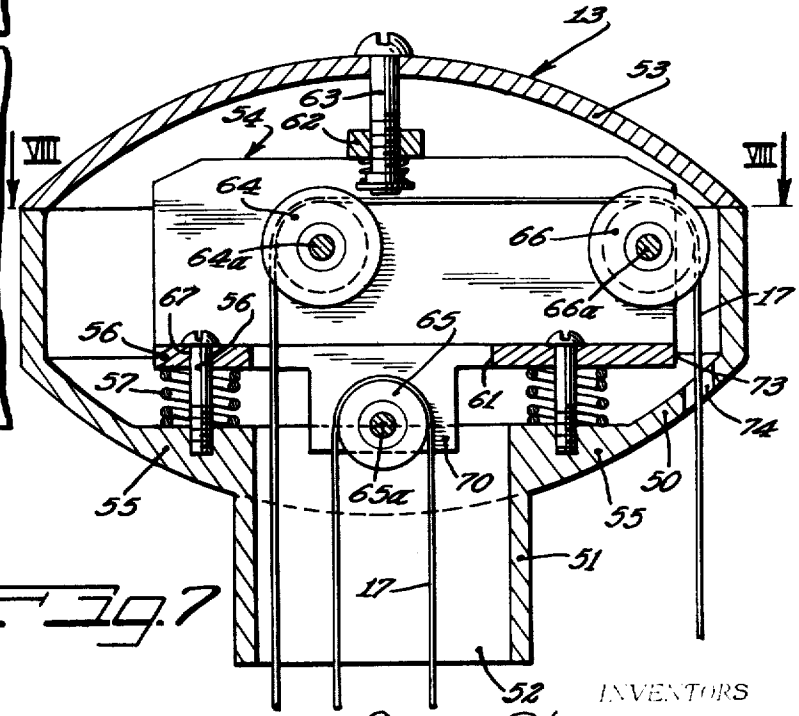


Fig. 7

INVENTORS
Gene Stangarone
Frank A. Cassara
Eugene F. DuPont
BY Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

Fig. 9

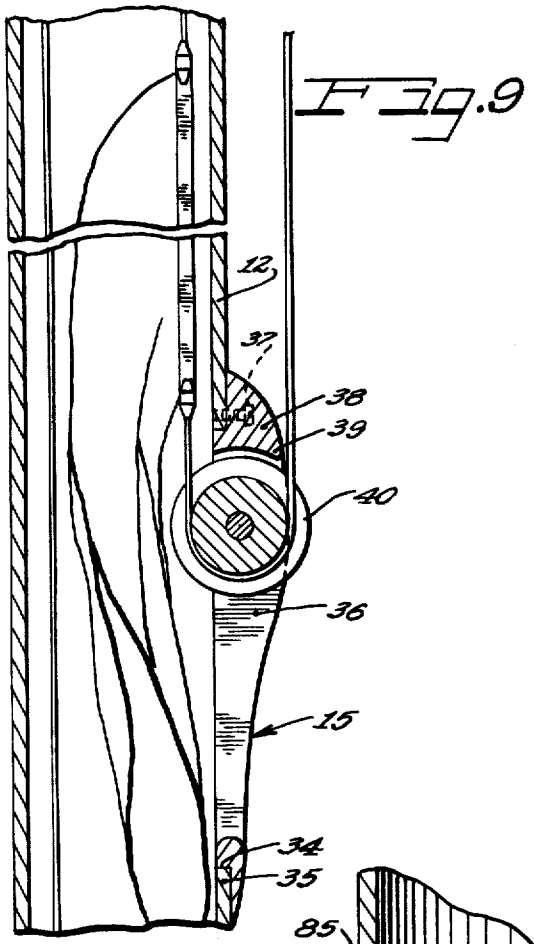


Fig. 10

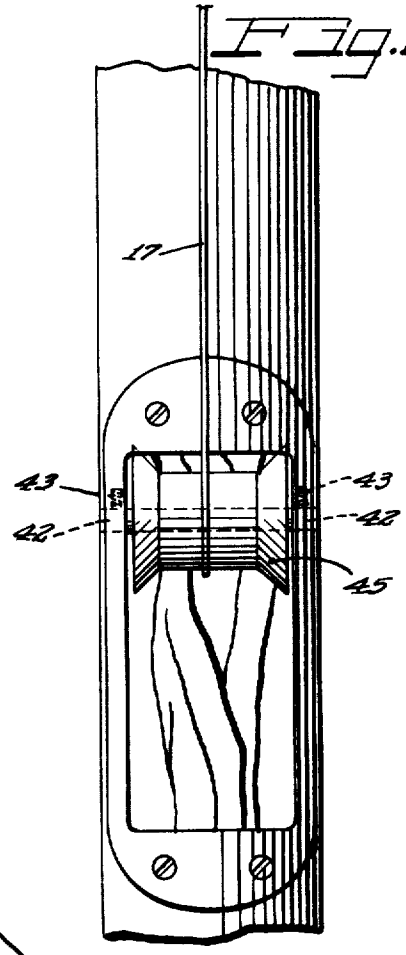
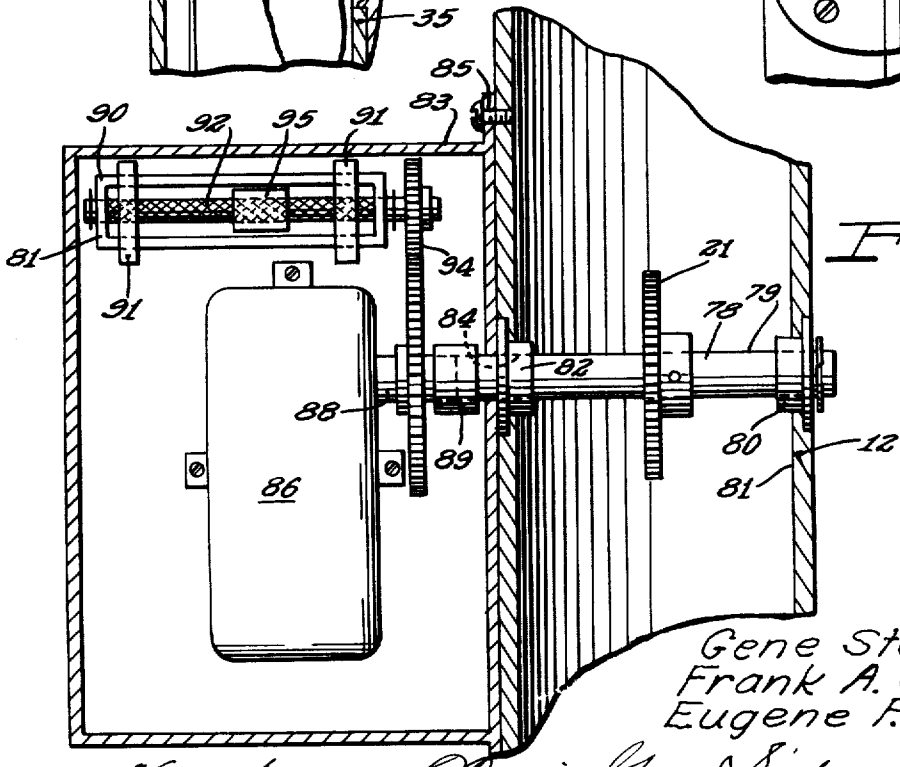


Fig. 11



INVENTORS
Gene Stangarone
Frank A. Cassara
Eugene F. DuPont

BY Kill, Sherman, Meroni, Gross & Simpson ATTORNEYS

AUTOMATIC FLAGPOLE

BACKGROUND OF The INVENTION

1. Field of the Invention

This invention relates to flagpoles and specifically to a flag storing flagpole.

2. Prior Art

Hollow flagpoles which store the flag interiorly thereof during non-display times are known to the art. (See for example the U.S. Pat. to Ellis, No. 2,530,654 and the U.S. Pat. to Donkersloot, No. 3,418,967.)

Such poles normally involve a hollow tubular pole having a top mounted sheave over which passes a halyard having an inboard and an outboard reach, the outboard reach extending partially down the pole to a side opening where it returns to the interior of the pole and extends to a position adjacent the bottom where a driving mechanism for the lanyard is positioned. The flag is mounted on the halyard and movement of the driving mechanism will cause the flag to be lowered from a display position exteriorly of the pole through the midpoint opening to a storage position interiorly of the pole. Reversal of the driving mechanism will raise the flag through the midpoint opening to the display position exteriorly of the pole.

One of the primary advantages of such a pole is that the flag does not have to be removed from the halyard and attached thereto when being raised or lowered and a safe storage for the flag is provided. However, in practice, it has proved difficult to provide a midpoint opening and internal storage which will allow ingress and egress of the flag without complications, such as are caused by bunching of the flag. When the flag is drawn inwardly of the midpoint opening, the free end of the flag trails the halyard attached side and when the flag reaches the storage position totally interiorly of the pole, the free end has a tendency to drop downwardly and become bunched with the remainder of the flag interior of the pole. Thereafter, attempting to remove the flag from the pole can cause the bunching to jam up in the opening.

Further, because of the necessity of providing a sufficiently large midpoint opening to allow free movement of the flag in and out, external weather is granted admittance to the interior through the opening, thereby allowing the flag to be exposed to the elements even within the pole. Thus, during a rainstorm, the flag can become sufficiently soaked to speed its deterioration while aggravating the bunching problem.

SUMMARY OF THE INVENTION

These and other problems inherent in the prior art devices are overcome by the present invention which provides that the initial inboard reach of the halyard is in an upward direction towards the top of the pole. Thus, when the flag is drawn within the pole it is drawn inwardly and thence upwardly. This allows the free side of the flag to hang freely within the pole during storage in a position above the opening where it will not be exposed to the weather. When the flag is removed, the free end will initially drop down below the opening in a free hanging manner and then be drawn upwardly out of the opening. This prevents any bunching problem from occurring.

Further, in the preferred embodiment, the driving mechanism for the flag includes a chain drive segment of the halyard for positive drive. The chain drive segment indexes with a sprocket gear positioned interiorly of the pole at the bottom thereof which in turn is driven by an external mechanism. Because the driving mechanism is external to the pole, free access is available thereto without the necessity of providing a large opening in the pole which would otherwise weaken it. The flag is attached to the halyard by means which allow freedom of rotation of the flag without imparting rotation to the halyard to reduce fouling of the flag around the halyard. Further, in an alternative embodiment, a shield is provided at the top of the pole in the normal display position on the opposite side of the pole from the outboard reach of the halyard. The shield has a sufficient reach to prevent the flag from being wrapped around the pole as a result of wind action.

It is therefore an object of this invention to provide an improved flag storing hollow flagpole.

It is a further and more specific object of this invention to provide an automatic flagpole having a hollow interior for storing the flag therein, the flag storage position being above the side entrance of the halyard to the pole and the flag entrance being at the side entrance.

It is yet another and more specific object of this invention to provide a hollow flag storing flagpole having an endless halyard driven by an external drive operating an internal member in contact with the halyard, the halyard having an inboard reach and an outboard reach, the outboard reach extending from the top of the pole to a midway opening, the inboard reach extending from the midway opening back to the top of the pole and from the top of the pole to the driving member located adjacent the bottom of the pole and thence back to the top of the pole where it exits to the outboard reach whereby the storage position of the flag internally of the pole is above the midway opening.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure, and in which:

FIG. 1 is a fragmentary cross-sectional view of the flagpole of this invention illustrating the flag in its display and storage positions.

FIG. 2 is a fragmentary cross-sectional view of the flagpole of FIG. 1, illustrating the flag being withdrawn from the interior of the pole.

FIG. 3 is a fragmentary cross-sectional view of the center section of the pole of FIGS. 1 and 2, illustrating the position of the flag just prior to withdrawal.

FIG. 4 is a view similar to FIG. 3, illustrating the position of the flag just prior to entry to the pole.

FIG. 5 is a partial fragmentary plan view of one method of flag halyard attachment.

FIG. 6 is a partial fragmentary partially cross-sectional view of another method of flag halyard attachment.

FIG. 7 is a fragmentary cross-sectional view of the sheave mechanism mounted atop the pole of FIGS. 1 and 2.

FIG. 8 is a top plan view of the truck mechanism of FIG. 7.

FIG. 9 is a view similar to FIG. 3 illustrating the entrance to the pole in more detail.

FIG. 10 is a plan view of the midway entrance to the pole.

FIG. 11 is a fragmentary cross-sectional view of the driving mechanism of the flagpole of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates the flag storing flagpole **10** of this invention. It is a base **11** mounted hollow pole **12** closed at the top with a top mount housing **13** which may have an ornament **14** thereon. The pole **12** has a side opening **15** located intermediate its ends and a downwardly directed top opening **16** in the top housing **13**. The top opening **16** is positioned radially outwardly from the hollow pole itself. An endless halyard **17** which may be part chain **18** is positioned interiorly and exteriorly of the pole. The cable has an exterior reach **20** extending from the top opening **16** to the mid-opening **15** and two interior reaches **18** and **19** extending from the top housing **13** to a drive reel **21** located in the bottom portions of the pole **12**. A flat **22** is mountable on the halyard as by means of swivel connections **23** and when displayed, is positioned on the outboard reach **17** of the halyard. The flag is storable within the pole as indicated at **24** by moving the portion of the halyard to which the flag is attached through the mid-opening **15** and thence upwardly towards the top housing **13**. Thus, the flagpole of this invention provides both a display position **25** exteriorly of the pole and a storage position **24** interiorly of the pole without removing the flag from the halyard.

By placing the opening 15 between the top and the bottom of the pole, the security of the flag is ensured in that the opening 15 is normally placed above the reach of a person standing at the base of the pole, preferably shortly below the midpoint of the pole so as to allow the flat to be displayed at half mast. Further, by providing a storage position for the flag interiorly of the pole above the midpoint opening, the flag is protected against the vagrancies of weather when stored. Additionally, by providing a driving means for the halyard interiorly of the pole in the bottom thereof, it is possible to use an endless halyard which except for the out-bored reach 17 is not exterior of the pole, thereby preventing vandalism from occurring.

While it has been known in the past to provide flag storage interior of a hollow pole and to use an endless halyard activated by a driving means located in the base of the pole, it has been common practice to store the flag in the pole below the midpoint opening, thereby using a halyard which has only a single interior reach from top to bottom of the pole and a second half reach from the midpoint opening to the bottom with the remainder of the halyard being the exterior reach. By providing for storage of the flag below the midpoint opening, weather entering the opening, such as rain, sleet or snow, will then fall onto the flag, hastening its deterioration. Additionally, such prior art devices have not been entirely satisfactory in that they have allowed the flag to bunch up either upon entrance to the pole or exit therefrom, or while it is stored interiorly thereof.

As the halyard is drawn downwardly towards the entrance and thence through and further downwardly, as is the case with prior art devices, the tail end of the flag, i.e., that portion not attached to the halyard, will drop initially below the opening and then have to be drawn upwardly, inwardly and downwardly in a U-shaped fashion to achieve entrance to the storage position where the free end will then be allowed to fall further downwardly over the halyard attached end. At this point, bunching can occur. Thereafter, attempting to draw the flag outwardly while it is bunched can cause a jam in the opening which may result in ripping of the flag.

In the present invention, when the flag is stored in the storage position internally, the free end 30 hangs downwardly therefrom interiorly of the pole in a natural free position. As illustrated in FIG. 3, as the halyard is moved so as to bring the flag through the opening, the free end 30 will extend downwardly into the interior 31 of the pole below the opening 15 until the first portion 32 of the flag to exit from the opening, i.e., that portion of the flag which will be the top corner attached to the halyard when in the display position, begins to exit through the opening 15. As this occurs, the free end portion 30 of the flag will then be drawn upwardly and outwardly, as illustrated in FIG. 2. When the flag is moved from the display position 25 to the storage position 24, the reverse mechanism occurs when the free end 30 of the flag, as best illustrated in FIG. 4, initially drops below the opening 15 exteriorly of the flagpole until the first portion 33 to enter, i.e., the bottom corner attached to the halyard when in the display position, enters the opening. Thereafter, the free portion 30 will begin to be drawn upwardly into the pole in a smooth manner which does not require that the flag go through a U-turn. When the entirety of the flag is interior of the pole, it will be hanging in its natural free-fall state, and the flag will not be required to fall down upon itself, thus allowing it to bunch up. At this point it will be fully protected from the weather, inasmuch as it is above the midpoint opening which is the entrance opening to the pole.

As can best be seen in FIGS. 9 and 10, the midpoint opening 15 consists of a curved rectangular opening 34 in the wall 35 of the pole 12 into which is received a molded fitting 36 which may be secured thereto by means of screws 37, adhesive, brazing or the like fastening means. The molding is thicker at the top 38 thereof and has a lip 39 extending outwardly over a wide sheave wheel 40 positioned in the top of the opening. The sheave wheel 40 has an axle 41 therethrough which is embedded in openings 42 in the sides of the molding. Preferably the openings 42 are taller than the axle, allowing vertical movement therein. A pair of coil springs 43 is received in vertical holes communicating to the openings 42 and act against the axle 41 to bias it vertically downward. In this way, the sheave wheel 40 is free floating in that is has a limited amount of vertical movement so as to maintain tension on the halyard 17 and yet be capable of a given amount of movement when the flag fittings pass therethrough. The sheave wheel 40 is axially elongated with frusto-conical outturned lips 45 on either end thereof which terminate in close-spaced relation to the side of the molding 36, so as to prevent slippage of the halyard off of the sheave wheel.

Placement of the sheave wheel adjacent the top of the molding allows sufficient room below the wheel for entrance of the flag and halyard. Provision of the thickened upper portion 38 and overhanging lip 39 of the molding allows the sheave wheel to be placed with the major portion of its diameter interior of the overhang. This will effectively prevent the flag from entering the small space between the top of the center section of the sheave wheel and the molding as the flag is being lowered. It will of course be appreciated that both during lowering and raising of the flag, the sheave wheel is rotating in a direction which will maintain any loose folds of the flag which come in contact with it from entering the space between the top of the sheave wheel and the molding.

As best illustrated in FIGS. 7 and 8, the flagpole top housing 13 consists of a cup-shaped lower section 50 having an axially extending tubular section 51 depending therefrom, defining a central opening 52 through the bottom of the cup-shaped housing 50. The cup-shaped housing 50 is closed by a spherical section cap 53 which is fastened as by means of a nut 63 to an anchor portion 62 which may be attached to a sheave block 54 or which may alternatively, when using a floating sheave block, be attached to the cup-shaped member 50. It is to be understood that the attachment bracket 62 may include a spring mechanism allowing direct attachment to the top of the sheave block, even when the sheave block is a floating block as is hereinafter described in the preferred embodiment, and which is illustrated in FIG. 7.

The sheave block 54 is merely a support and attachment member for the upper sheave wheels 64, 65 and 66. The sheave block 54 includes a base member 56 on which are mounted two upright, spaced-apart walls 59 and 60. The sheave block 54 is attached to the cup-shaped member 55 as by means of bolts 56 threaded into a thickened portion 55 surrounding the central opening 52. The bolts 56 are freely received in openings 67 through the base portion 56 and coil springs 57 are entrapped between the base portion 56 and the cup-shaped housing 50, whereby the sheave block 54 is in floating relationship to the cup-shaped housing 50 so as to take up any slack in the halyard 17 while reducing jerk forces thereon which might otherwise overstrain the halyard.

The base plate 56 has a central opening 61 in the bottom thereof from the side walls of which project flanges 70 which may extend down into the central opening 52 of the cup-shaped portion 50. The flanges 70 are spaced apart approximately equal to the spacing between the walls 59 and 60, and support the axle 65*a* of the sheave wheel 65. The walls 59 and 60 support the axles 64*a* and 66*a* of the sheave wheels 64 and 66, which are mounted above the sheave wheel 65 and to either side thereof. The sheave wheel 66*a* is mounted at one end 73 of the truck 54 so that that portion of the halyard 17 which rides over it from the sheave wheel 64 can be directed downwardly through an opening 74 in the bottom wall of the cup-shaped housing, thus providing an exit for the halyard at the start of its outboard reach. From the sheave wheel 66, the halyard 17 passes back to the top of the sheave wheel 64 and thence downwardly through the central opening 52 into the interior of the pole where it is attached to the sprocket chain portion 18. The sprocket chain portion passes around a sprocket wheel driving member 21 positioned on an axle 78 mounted in the lower portions of the pole 12. The other end of the sprocket chain 18 is attached to the inboard reach portion 19 of the halyard which extends upwardly and around the

sheave wheel **65**, thence downwardly to the sheave wheel **40** positioned in the mid-opening **15**, thence around the sheave wheel **40** where it becomes the outboard reach **20** extending up through the opening **74** to the sheave wheel **66**.

The sprocket wheel **21** which receives the sprocket chain **18** to drive the halyard is located in the lower portions of the hollow pole **12** and is mounted on an axle **78** which has one end **79** thereof received in a bearing block **80** attached to the inside wall **81** of the pole. Diametrically opposite the bearing block **80** is a bearing block **82** also attached to the inside wall **81** through which the axle **78** projects and is supported. The axle continues through an opening **84** in the wall of the pole to the interior of a motor driving box **83**. The motor driving box may be attached to the pole as by fastening means **85** and contains an electric motor **86** and a control element **87**. The electric motor drives a shaft **88** coupled to the axle **79** through a coupling **89** which may be of the clutch type to prevent overstraining the system should the halyard become fouled. However, preferably the coupling **89** is a direct coupling and the motor may contain an internal clutch which would stop rotation of the shaft **88** in the presence of overloading forces.

The control **87** is a positive action control consisting of a frame **90** on which are mounted in adjustable relation spaced-apart contact switches **91** which control stopping of the motor **86**. A threaded shaft **92** is received in the frame **87** and is driven by a gear train **94** attached to the shaft **88**. A non-rotatable axially movable block **95** is mounted on the threaded shaft and moves in response to rotation of the shaft **92**. When the block **95** contacts either one of the switches **91**, it will turn off the motor until the motor is turned on by an outside switch. The motor is of the reversible type and preferably is wired to the switches **91** such that when one of them is in contact with the block **95**, further actuation of the motor from an outside source will cause it to rotate in the opposite direction to move the block **95** towards the other switch. The provision of a mechanical switching mechanism controlling the motor coupled with the chain drive on the halyard provides for positive control of placement of the flag when in both the display and storage positions while allowing all of the electrical controls for the pole to be located at the bottom thereof. This is not the case in connection with some prior art devices which have suggested locating trip switches internally of the pole where they will be acted upon by a halyard carried stop. Further, provision of the motor housing outside of the pole eliminates the necessity of providing a large opening into the interior of the pole which can weaken it. The only opening to the interior of the pole located in the bottom area is the small hole through which the axle **78** extends.

In order to eliminate the possibility that high winds may wrap the flag **22** around the pole **12** thereby fouling it at the top of the pole, a triangular sail **100** may be attached to the pole adjacent the top thereof. The sail **100** is attached exterior of the pole directly opposite the display position of the flag and has a dimension sufficient to extend outwardly from the pole at its widest portion a distance sufficient to prevent the flag from wrapping around the pole and sail. It is to be noted that FIG. **1** illustrates the sail as having this widest portion located along its bottom. It is to be understood that this position may be reversed. For esthetic reasons, the sail **100** may be constructed of a clear plastic.

In order to prevent the flag from wrapping itself around the halyard, a swivel attachment may be made between the halyard and the flag. One form of this is illustrated in FIG. **5** wherein the halyard **17** is attached to two spaced-apart swivel connections **102** which in turn are connected to a cord **103** running therebetween. The flag **22** is then connected to the swivel connections **102** at their opposed ends **104**. The cord **103** prevents the swivel connections from being drawn apart a greater distance than the width of the flag, thereby eliminating any stretching on the flag itself. The swivel connections **102** are of the type which allow one end portion **106** thereof to swivel independently of the other end portions **104**.

Another type of swivel connection is illustrated in FIG. **6**. In this embodiment, the flag **22** has a reinforced marginal section **110** along the halyard side thereof to which are attached fastening members **111** having threaded ends **112** projecting therefrom away from the flag. A mating member **113** has an internal bore **114** in one end thereof which is threaded to receive the plug **112** and an axial opening **115** which communicates through the member **113** to the bore **114**. Positioned in the bottom **117** of the bore **114** is an anti-friction bearing **118** the outer ring of which contacts the side walls of the bore **114** and the inner ring of which is co-axial with the opening **115**. The halyard **17** extends through the opening **115** and terminates in an increased diameter stop **119** which is drawn against the inner ring **120** of the anti-friction bearing. It can therefore be seen that the flag is supported on the halyard **17** through the swivel connection which is free to rotate thereon through the anti-friction bearing **118**.

It can therefore be seen from the above that my invention provides a flag-storing hollow flagpole which has an endless halyard, a portion of which comprises an external reach from the top of the pole to a position intermediate the ends of the pole where it extends into the interior of the pole through an opening in the pole. The halyard then extends upwardly interior of the pole through a flank storage area to a sheave wheel located in the upper reaches of the pole. The halyard thereafter extends downwardly to a drive mechanism located adjacent the bottom of the pole and thence upwardly again to the top thereof where it extends outwardly to provide the exterior reach.

We claim as our invention:

1. A flag storing hollow flagpole which comprises: a hollow pole having an opening therein located intermediate its ends and an opening at the top end thereof, a halyard associated with said pole, said halyard having a portion thereof disposed interiorly of said pole and a portion thereof disposed exteriorly of said pole, the said external portion extending only from the top opening to the said opening intermediate the ends of said pole, a storage position for a flag mounted on said halyard, said storage position interior of said pole, said storage position located between said opening intermediate the ends of said pole, and the said top of said pole and the entrance for said flag to the said interior of the said pole being through the said opening located intermediate the said ends of the said pole, the halyard having a portion extending from said intermediate opening interior of the pole upwardly towards the top of the pole through the storage position, said halyard being continuous, means adjacent the top of the pole guiding the halyard from the interior of the pole to the exterior thereof, means at the said opening intermediate the ends of the pole guiding the said halyard from the exterior of the pole to the interior and thence upwardly towards the storage position and drive means associated with the said pole connected to the said halyard moving the said halyard.

2. The pole of claim **1** wherein a driving means for said halyard is associated with the said pole, the said driving means including a halyard contacting drive reel located interiorly of said pole adjacent the bottom thereof and a driving box adapted to drive the said halyard contacting drive reel located externally of the said pole.

3. The flagpole of claim **2** wherein a sheave wheel block is mounted atop the said flagpole and the said halyard extends from the said halyard contacting drive reel in the bottom of said pole interiorly of the said pole to a sheave wheel mounted on the said sheave block, thence outwardly of the said flagpole through the said top opening, thence downwardly exteriorly of the said flagpole to the said opening intermediate the said ends of the said pole, thence inwardly to the interior of the flagpole, thence upwardly to the sheave wheel block through the flag storage position, thence downwardly to the drive reel.

4. A flagpole comprising: a hollow pole having a top and a bottom, a plurality of sheave wheels located at the top thereof, an exit from the top thereof to the exterior of the pole, an opening in said pole located intermediate the ends thereof, a

halyard driving means located in the bottom of the pole interior thereof, a halyard extending from the said driving means to at least one of the said sheave wheels thence through the opening in the top of the pole to the exterior thereof, thence through the opening in the pole intermediate the ends thereof, thence upwardly to at least one of the said sheave wheels, thence downwardly to the said drive means.

* * * * *