June 25, 1963 W. N. NICHOLS 3,095,157

POWER OPERATED CHART STORAGE MEANS

Filed Jan. 11, 1961 3 Sheets-Sheet 1

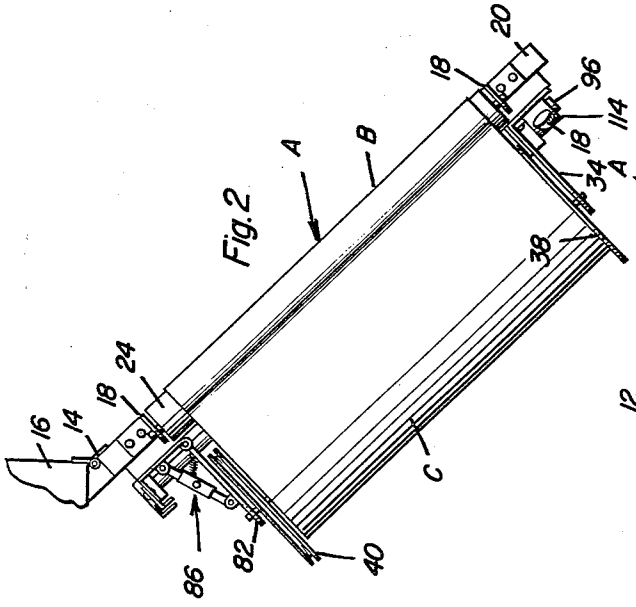


Fig.2

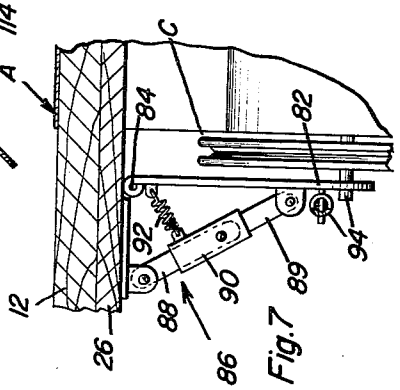


Fig.7

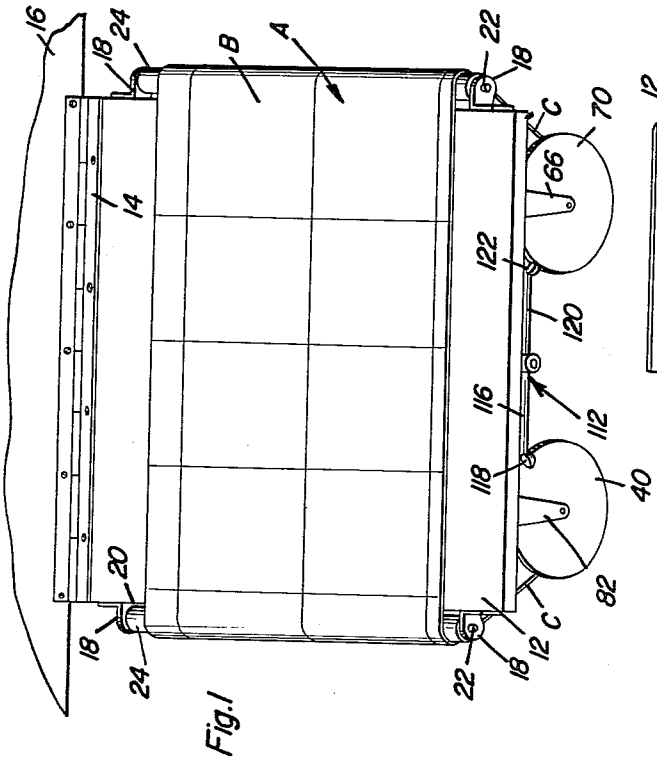


Fig.1

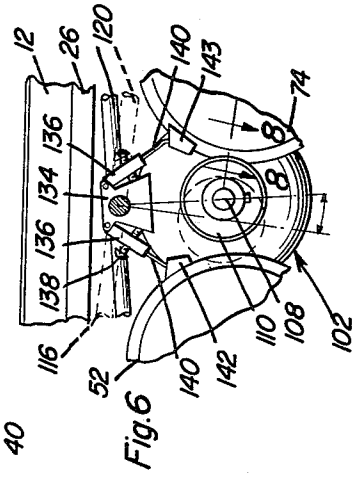


Fig.6

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POWER OPERATED CHART STORAGE MEANS

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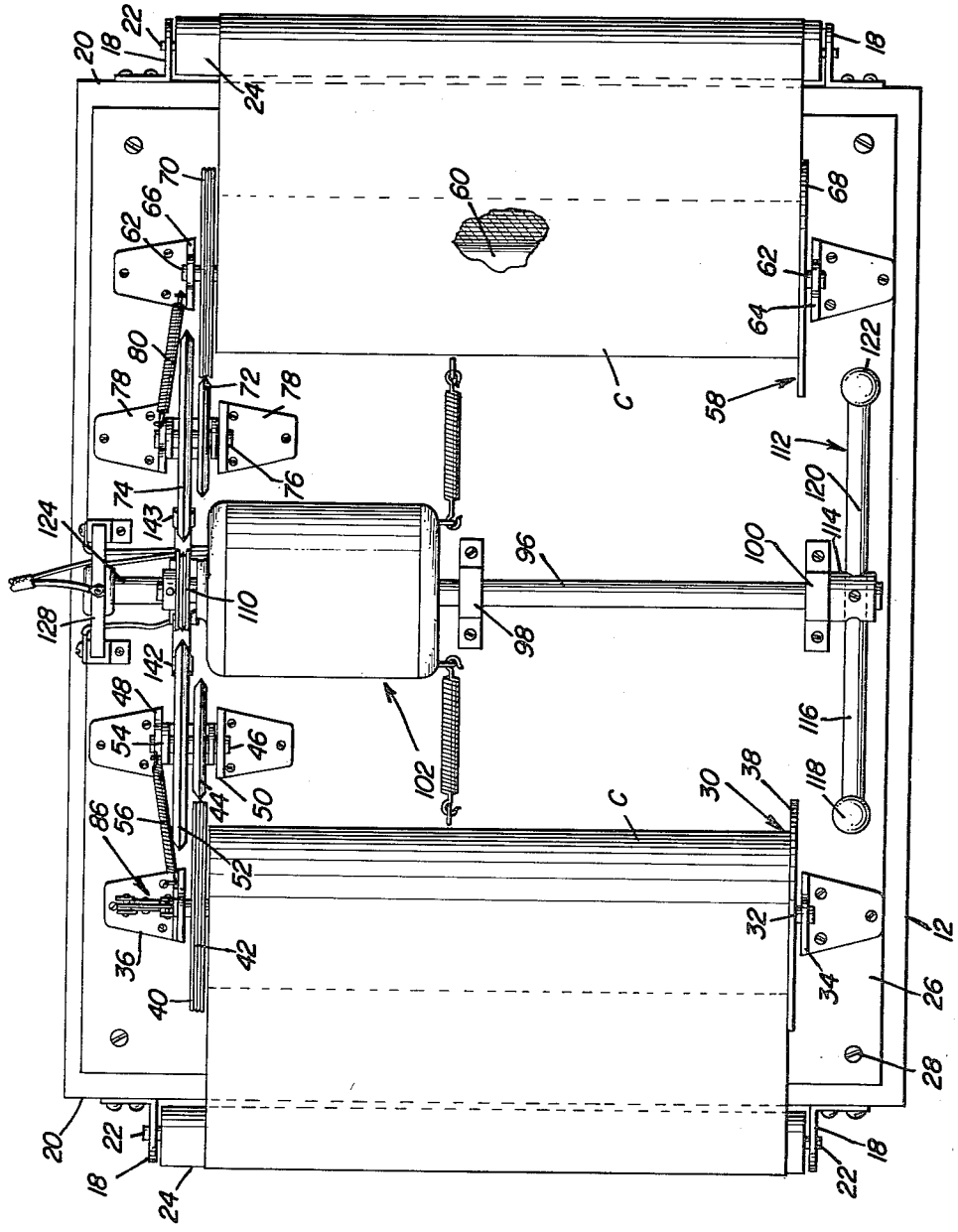


Fig. 3

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POWER OPERATED CHART STORAGE MEANS

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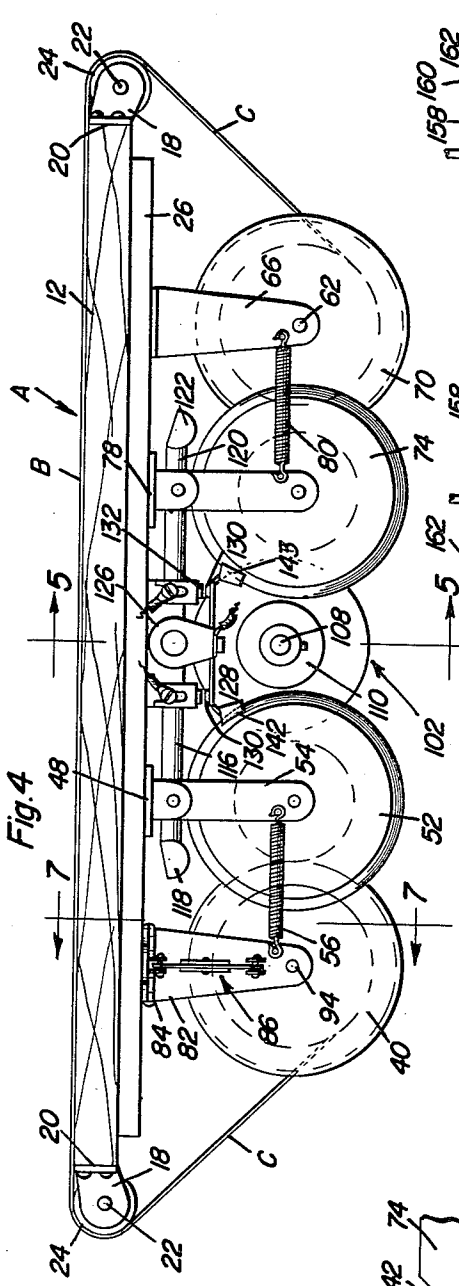


Fig. 4

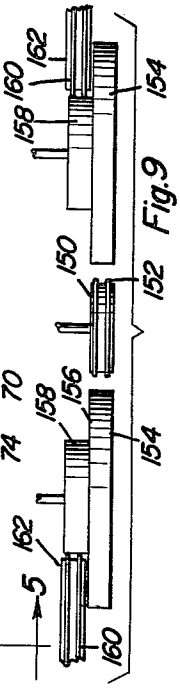


Fig. 9

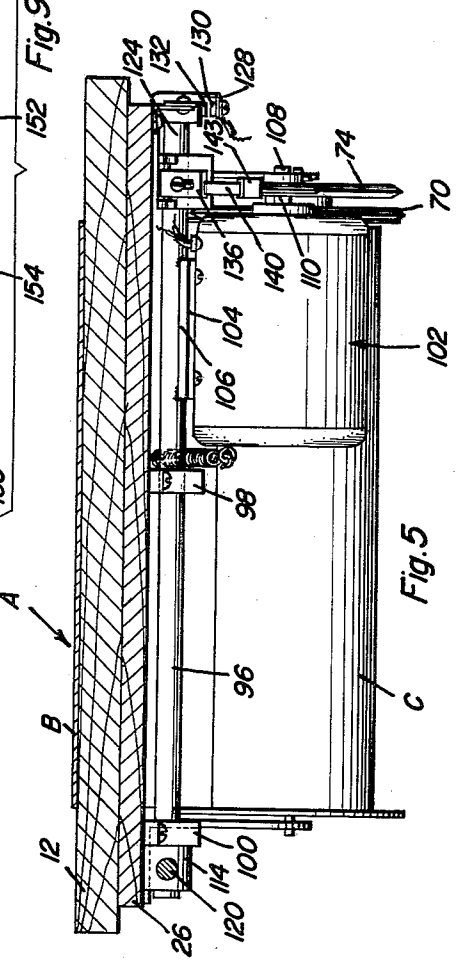


Fig. 5

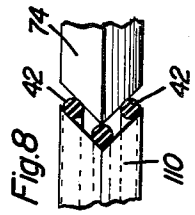


Fig. 8

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United States Patent Office 3,095,157 Patented June 25, 1963

3,095,157

POWER OPERATED CHART STORAGE MEANS

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4 Claims. (Cl. 242—67.4)

This invention relates to improved means for storing and viewing ship and vessel charts and has to do with a more or less standard chart table and novel facilities thereon for effectually handling charts in a manner to permit the charted indicia to be consulted expeditiously, whereby to save valuable time and to, at the same time, maintain the charts in good condition over a relatively long period of repetitional usage.

Persons conversant with the art to which the invention relates are aware that on virtually all ships and vessels from 28 feet on up to at least 100 feet, storage facilities and space are invariably at a premium. Considering the fact that the average vessel may be traveling most of the time it is evident that a multiplicity of charts are needed and referred to. Almost any vessel in the category stated will have aboard at least 40 to 80 charts. The problem is always the same; namely, to quickly find a particular chart that may be there and then needed. The present and prevailing method is to store charts, when they are not in use, by rolling them up and sticking them in spaces between cabin beams. Manifestly, with this practice it is difficult to find a wanted chart. Then, too, rolled up charts are usually dirty and worn after comparatively short usage. Obviously, this situation has posed a problem and it is this problem which gave rise to the instant concept and the invention which, it is submitted, will satisfactorily solve the problem.

Briefly, the invention at bar comprises power-operated means; namely, electric motor driven spools on which end portions of a charted strip or web are wound. By using a suitable reversible motor and motion-transferring and transmitting means between the motor shaft and the spools, the spools may be caused to rotate in a manner to cause the charts on the strip to move back and forth, whereby to select a given chart for viewing and also to thus enable the charts to be effectually stored and protected.

In choosing a preferred embodiment of the invention the regular chart table is simply provided on the underneath side with a suitable base panel and all of the principal component parts are conveniently and effectually attached to and suspended from the underneath side of the panel.

More explicitly, the invention in an over-all sense is characterized by a chart table an edge of which is adapted to be hingedly mounted on a stationary support, said table having planar top and bottom surfaces, the top surface designed and adapted to allow a flexible charted strip to shift and travel back and forth thereon, said table having opposite transverse ends provided with paralleling free-turning guide rollers over which cooperating reelable portions of the strip may be trained and so that the usable portion of the strip may be shifted flatwise for viewing and reading the charted indicia, and a self-contained attachment embodying a base panel superimposed upon and secured to the bottom of said table, strip winding and reeling spools mounted on end portions of the underneath side of said panel adjacent to end portions of the panel and their respective guide rollers and on which end portions of the strip are wound, and manually controllable strip moving and stopping means consolidated and suspended from a median portion of the panel and situated between the spools and designed and adapted to selectively impart rotation to the spools.

Construed as an attachment for a conventional hinged-type chart table, the invention pertains to a base panel, a rockshaft mounted for oscillation on a central portion of said panel, a cross-head fixed on one end of the shaft providing left and right selectively usable hand levers, circuit make and break movable contact elements mounted on an opposite end of the rockshaft for coaction with fixed contact elements mounted cooperatively on the panel, an electric motor having a casing fixed on a median portion of the rockshaft to rock in conjunction therewith, said motor having an axial drive shaft carrying a drive element, spools mounted for rotation parallel to and also to the right and left of the rockshaft's position, and driven elements on end portions of the spools cooperable with the drive element by way of intervening motion transferring and transmitting idlers.

While it is within the purview of the inventive concept to utilize a train of gears to transfer or transmit motion from a pinion on a drive shaft on the motor, it is preferred that friction driving sheaves be utilized. To this end, the drive sheave on the motor shaft may be caused to swing to either the right or left of a normal center line by reason of the fact that the motor is fixed on an oscillatory rockshaft. This arrangement and construction permits the sheave to be engaged with idling sheaves which are pivotally mounted and spring-loaded and which, in turn, transfer the motion by way of smaller sheaves to relatively large sheaves at the ends of the strip winding drums or spools.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a plan view which is drawn somewhat in perspective and which shows the invention and the manner in which it is used.

FIG. 2 is an end view of the same illustrating the slant or degree of inclination when using the charted strip.

FIG. 3 is an enlarged bottom plan view wherein all of the principal component parts are revealed, the drive sheave and the motor and rockshaft being in neutral position.

FIG. 4 is an elevational view showing the details and their association and arrangement from another point of view.

FIG. 5 is a section on the vertical line 5—5 of FIG. 4, looking in the direction of the arrows.

FIG. 6 is a fragmentary view in elevation the purpose of which is to show the off and on position of the drive sheave and the construction, arrangement and action of the simple brake means.

FIG. 7 is a detail section with parts in elevation on the vertical line 7—7 of FIG. 4.

FIG. 8 is a detail section on a large scale taken on the line 8—8 of FIG. 6.

FIG. 9 is a diagrammatic view showing a slightly different construction and arrangement of sheaves with planar peripheral surfaces and rubber or equivalent O-rings on certain of the sheaves.

The aforementioned chart table is denoted generally by the numeral 12 and is flat-faced and generally rectangular in plan. As illustrated in FIGS. 1 and 2 an upper edge portion thereof is hingedly mounted as at 14 on a suitable relatively stationary support 16. Simple angle brackets 18 are mounted on the transverse ends 20 and are provided with bearings to accommodate journals 22 at the ends of free-turning guide rollers 24.

As before mentioned, all of the essential or component parts which go to make up the unique storing and oper-

ating facilities are mounted on a simple base panel 26 which is superimposed against the underneath side of the table and screwed or otherwise held in place at 28. The spool to the left in FIG. 3 is denoted as a unit by the numeral 30 and has journals 32 journaled for rotation in bearings provided therefor on the fixedly attached oppositely disposed hanger brackets 34 and 36. The numeral 38 designates a head at one end of the spool. The numeral 40 designates a marginally grooved sheave or motion-transmitting element at the other end. The grooved periphery may be provided with suitably attached O-rings 42 to accommodate a cooperating motion-transmitting smaller sheave 44 carried by a shaft 46 mounted in brackets 48 and 50. This sheave 44 is a component with the larger speed-reducing sheave 52 in the manner shown. This sheave is pivotally suspended as at 54 and the sheaves 44 and 40 are maintained in constant operating relationship by way of a suitably tensioned and mounted coil spring 56. The right hand spool in FIG. 3 is denoted generally by the numeral 58 and the drum portion 60 thereof is provided with journals 62 mounted in bearings provided therefor in the L-shaped hanger brackets 64. The construction here is the same as that already described in that a simple disk-like head 68 is provided at one end and a marginally grooved sheave 70 provided at the opposite end. This sheave receives motion from the relatively small friction engaging sheave 72 and the companion sheave 74 which sheaves are on a common axle 76 pivotally suspended from the hanger brackets 78. Here again, a tension spring 80 serves to maintain the respective sheaves in proper friction-driving engagement.

Reverting to the bracket 36 and with reference in particular to FIG. 7 it will be seen that this is of a special construction to allow the drum to be removed. More specifically, the depending leg 82 is hingedly mounted at 84 and a stay device 86 is here provided. This device embodies pivotally mounted links 88 and 89 and a locking sleeve 90 which is spring-biased as at 92 to maintain its desired position. By collapsing or folding the stay device 86, which is permitted by moving the sleeve 90, the limb or leg 82 can be disengaged from the journal 94.

Attention is now directed to FIG. 3 again wherein it will be noted that the numeral 96 designates a rockshaft which is mounted and oscillatable in suitable attaching brackets 98 and 100. The casing of the electric motor 102 is provided (FIG. 5) with a base 104 fixed to an adapter plate 106 mounted on the rockshaft so that the motor swings in conjunction with the oscillation of the rockshaft. The drive shaft 108 of the motor is provided with a driver element 110 here shown in the form of a grooved wheel or sheave. This sheave is in line with the aforementioned sheaves 52 and 74 as shown in FIG. 3. The rockshaft is also provided with a controller handle 112 which comprises a simple rod secured by a collar or hub 114 to the end portion of the rockshaft. This arrangement provides the left-hand lever 116 to the left with a suitable finger-piece 118 and a second lever 120 to the right with its finger-piece 122.

The opposite end portion 124 of the rockshaft serves to operate the motor off and on switch which comprises, as shown in FIG. 4, means 126 carrying an arm 128 having relatively movable contact buttons 130 on the ends thereof alternately cooperable with fixed contact buttons 132. Suitable wiring is provided here to permit the switch means, when properly actuated to turn the reversible motor 102 off and on.

Simple mechanical brake means is employed to prevent the charted strip A from becoming too loose and sagging. The readable portion B of the strip is shown passing over the flat surface of the table for use in the manner illustrated, for example, in FIG. 1. The end portions are rolled or wound as at C on their respective winding and reeling spools. Now, with reference to FIG. 6 and the brake means, this comprises a block-like fixture 134 which is fixedly mounted on the rockshaft and which, in turn, is provided with hingedly mounted lugs 136 carrying adjusting screws 138 and also carrying spring fingers 140 which, in turn, are provided with drag shoes 142 and 143 which engage their respective idlers or sheaves 52 and 74, respectively. It will be noted that FIG. 6 also shows the manner in which the shoes swing from left to right to engage their respective idling sheaves and in addition shows the off and on position of the drive element or sheave 110.

In practice it will be obvious that the strip A is stretched flatwise across the top of the table and that the end portions C are wound on their respective spools or drums. The aforementioned brake means serves to prevent accidental unwinding of the spools when the motor 102 and its drive element 110 is in the neutral position shown in FIG. 3. Obviously, by operating either lever 116 or 120 the rockshaft 96 is oscillated to the left or the right as the case may be and that the motor 10 is likewise tilted as brought out in FIG. 6 to bring the drive element into operating engagement with the selected idler. The idler turns and this, in turn, transfers or transmits motion to the desired spool making it possible to move the charted strip from left to right or from right to left as the case may be.

In FIG. 9 the motor shaft is provided with a driver or wheel 150 having O-rings 152 on its periphery to engage smooth marginal edges 154 of the idlers 156, the latter carrying smooth marginal complements 158 to engage the rubber O-rings 160 on the spool driving elements 162. This is simply an alternative driving arrangement which may be used if desired.

What is claimed as new is as follows:

1. A chart table attachment comprising a flat base panel adapted to be mounted on the underneath side of a chart table over which a strip map is transported and which is provided with free turning guide rollers to opposite transverse end portions, complemental coplanar strip map reeling and storing spools operatively mounted on the underneath side of the panel adjacent to and parallel with end portions of the panel, said spools provided at corresponding ends with individual friction driven elements, motion transmitting speed-reducing idler sheaves coplanar with each other and having individual constant friction-driving cooperation with their respective driven elements, a rockshaft located in a space between the spools and extending transversely across the central portion of the panel and mounted for angular rotation in brackets provided therefor on said panel, said rockshaft provided at one end with selectively usable manually trippable levers, one lever projecting in a direction on toward the right of the user and the other in a direction toward the left of the user, a plate having a median portion fixed to said rockshaft and having edge portions tiltable toward and from the panel depending on the levers which are operated, a longitudinally disposed reversible-type electric motor having a casing fixed on said plate and having an axial shaft provided with a drive element coplanar with and normally in the space between the adjacent idler sheaves, the shaft being parallel to but eccentric from the axis of the rockshaft and the drive element thereon being selectively movable into direct friction-driving contact with the selected idler sheaves, coil springs at right angles to and attached at inner ends to the motor casing and having outer ends fixed on said panel, said springs serving to normally maintain said plate parallel with the panel and the drive element in a neutral position between the idler sheaves.

2. The structure defined in claim 1 and in combination, brake shoes releasably engageable with the respective idler sheaves, and means supporting and operatively mounting the brake shoes on and from said rockshaft.

3. A chart table attachment comprising a flat base panel for mounting on the underneath side of a chart

table over which a strip map is supported, a pair of reeling and storing spools, means mounting said spools in parallel relationship on said panel, said means comprising two pairs of brackets secured to and depending from said panel, each spool being supported by one of said pairs of brackets, driven elements fixed to like ends of each spool, a shaft, means rockably mounting said shaft between the spools, said means comprising bracket members secured to and depending from the panel, a reversible-type electric motor fixed on and depending from said shaft and bodily rockable therewith, said motor being in substantially the same horizontal plane as said spools, said motor having an axial drive shaft carrying a drive element, idler sheaves mounted on said panel and positioned between the drive and driven elements for selectively transferring motion from the drive element to either one of the driven elements, spring means secured to and between the motor casing and the panel serving to normally maintain the motor in a neutral position between the idler sheaves, and a pair of oppositely extending selectively usable levers on said shaft, said levers actuatable to rock the shaft so as to selectively engage one of said idler sheaves for the driving of the adjoining spool.

4. The structure defined in claim 3 wherein one of

said spool supporting brackets is pivotally secured to said panel for movement into and out of supporting engagement with the adjoining spool, a stay extending between said one bracket and the panel, said strap consisting of a pair of pivotally mounted links and a locking sleeve spring biased into overlapping position on the adjoining ends of said links so as to releasably secure said links in a longitudinally aligned relation thereby maintaining said bracket in engagement with said spool.

References Cited in the file of this patent

UNITED STATES PATENTS

609,669	Greenleaf et al.	Aug. 23, 1898
1,224,634	Gottschalk	May 1, 1917
1,831,294	Englund	Nov. 10, 1931
1,846,004	Green	Feb. 16, 1932
2,692,779	Willsea	Oct. 26, 1954
2,765,552	Schlafly	Oct. 9, 1956
2,817,571	Lee	Dec. 24, 1957
2,837,294	Jacobs	June 3, 1958
2,896,873	Mageoch	July 28, 1959
2,951,653	Haenel	Sept. 6, 1960
2,965,323	Foster	Dec. 20, 1960
2,973,156	Draheim	Feb. 28, 1961