

July 21, 1931.

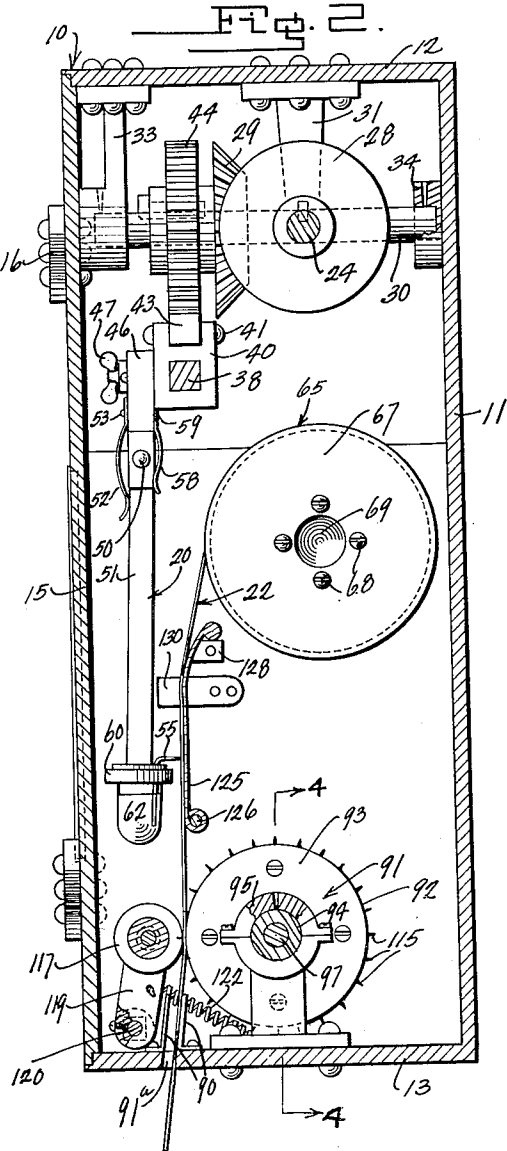
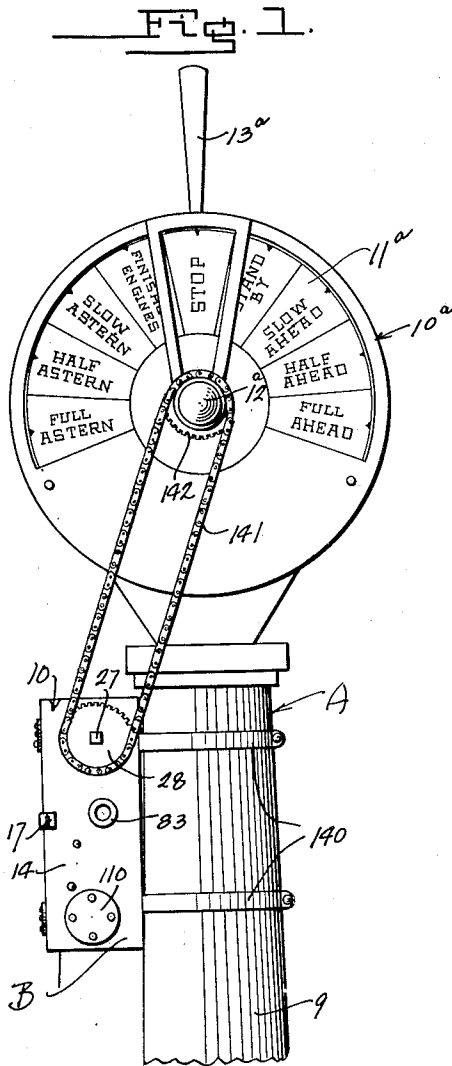
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SHIP'S TELEGRAPH RECORDER

Filed June 21, 1928

3 Sheets-Sheet 1



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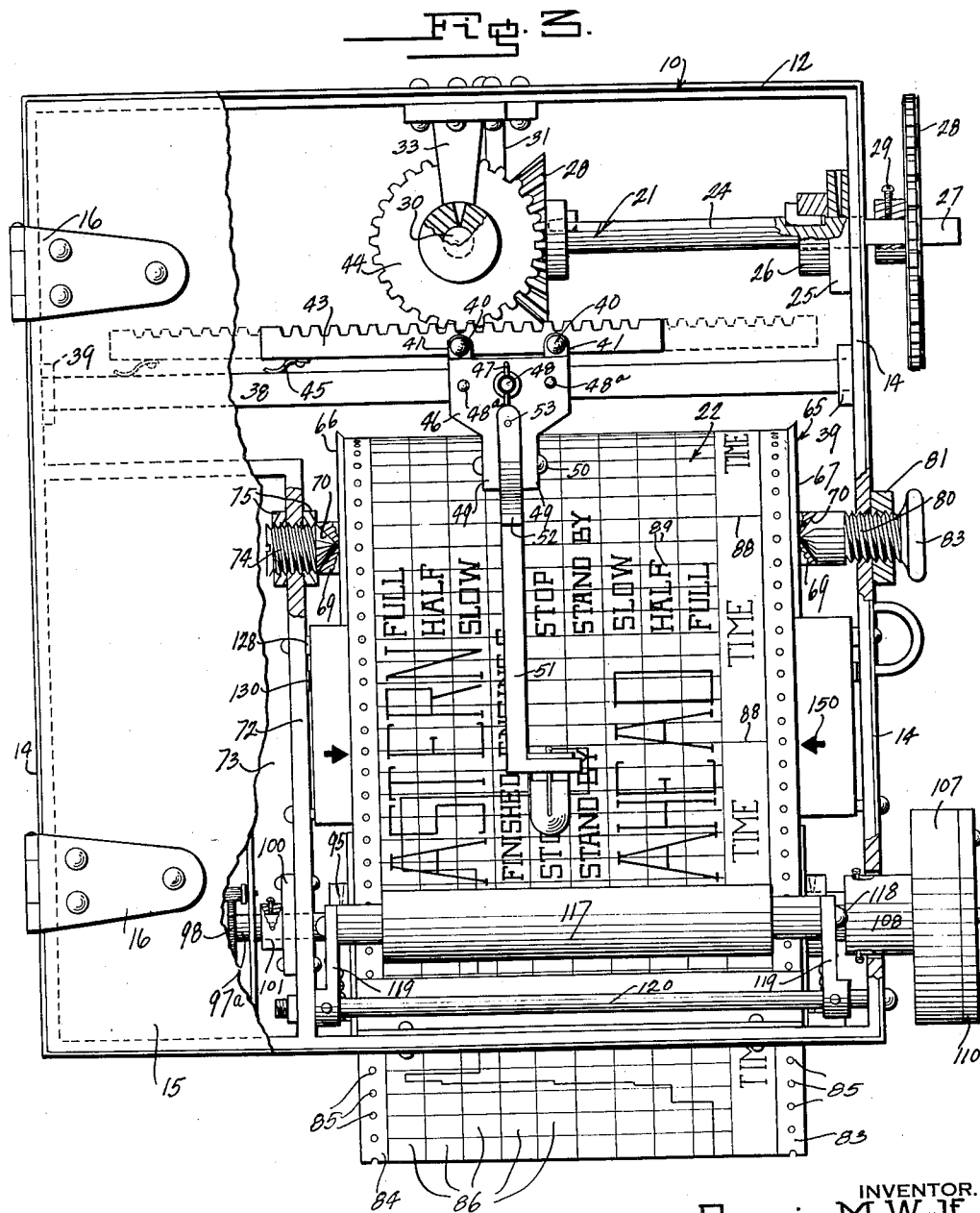
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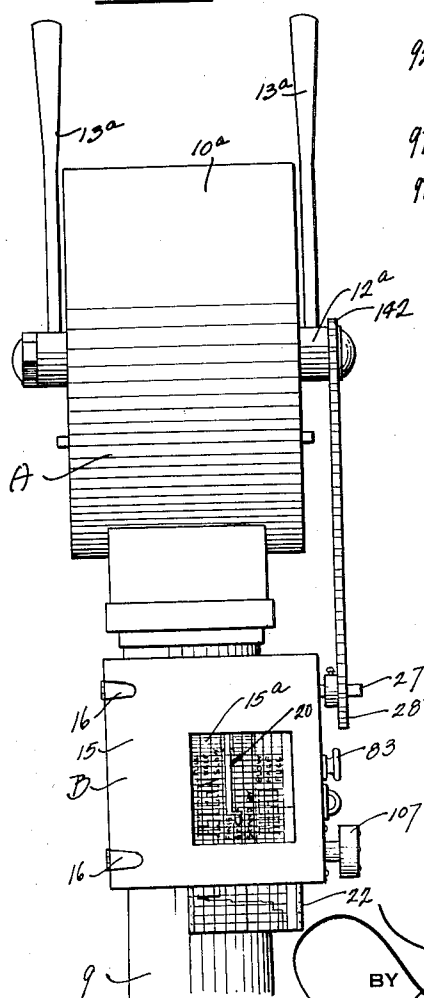
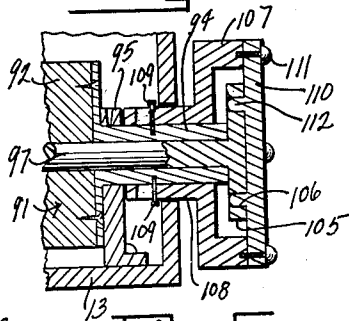
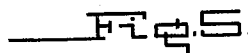
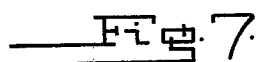
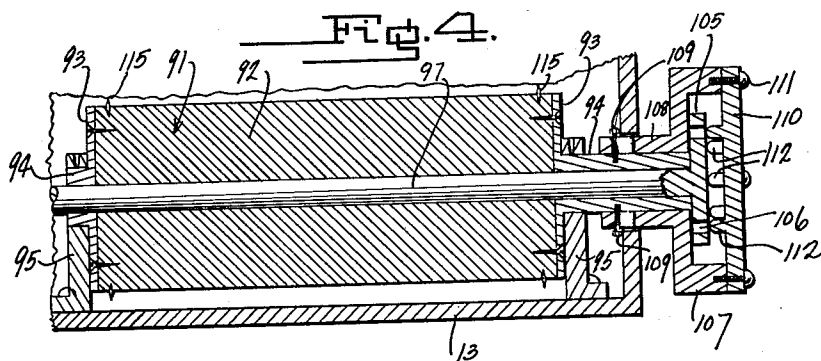
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SHIP'S TELEGRAPH RECORDER

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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SHIP'S TELEGRAPH RECORDER

Application filed June 21, 1928. Serial No. 287,092.

This invention relates to improvements in ship telegraph recorders.

On board a ship communication between the navigation bridge and the engine room is carried on by means of an instrument called a telegraph, by means of which orders for the speed of the ship are transmitted to the engine room. It is a primary object of this invention to carefully record the time and the nature of each order or bell sent to the engine room, in order that such information will be immediately available for rendering reports or the like, or available for future reference, in the case of accidents and collisions, so as to place before boards and courts of inquiry information and evidence from which a decision may be rendered.

A further object of this invention is the provision of a novel preferably portable type of recorder which may be efficiently used in connection with ship telegraphs for recording the time and nature of an order given; the improved device embodying a novel operated marker which scribes upon a constantly moving tape the time and nature of an order.

A further object of this invention is the provision of an improved means for moving recording tapes and the like.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters may designate corresponding parts throughout the several views,

Figure 1 is a side elevation of a ship's telegraph with the improved recorder attached thereto.

Figure 2 is a vertical sectional view taken through the improved recording mechanism, showing the operating details thereof.

Figure 3 is a fragmentary front elevation of the recording mechanism, with the cover of the casing removed and exposing operating details.

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 2, and

showing the means for feeding the recording tape.

Figure 5 is a fragmentary sectional view of parts shown in Figure 4, with the clutch engaged, in contradistinction to the "out" position shown in Figure 4.

Figure 6 is a view showing a female portion of a clutch used with the tape feed mechanism.

Figure 7 is a front elevation of the ship's telegraph, showing the improved recording mechanism associated therewith.

In the drawings, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate a ship's telegraph of any approved construction, with which the improved recording mechanism B may be portably associated.

The ship's telegraph A as is well known, comprises a standard 9 upon which a supporting casing 10^a of cylindrical or other formation is provided, having dials 11^a at one or the other or both sides thereof, with indicia thereon pertinent to the nature of orders which may be given in connection with ship operations. An operating shaft 12^a extends axially through the casing 10^a, and exteriorly of the casing 10^a at opposite sides it is provided with operating handles 13^a, which serve in the nature of indicators in connection with the various orders on the dial 11^a.

The recorder B includes a casing 10 having a rear wall 11; top and bottom walls 12 and 13; side walls 14; and a front closure 15 hinged at 16 to one of the side walls 14 and provided with a locking hasp 17.

A marker 20 is operatively supported by means of a bar 38 within the casing 10 for scribing upon a chart or tape 22 the relation of the orders and time thereof.

Means 21 is provided to move the marker 20. It includes a shaft 24 rotatably bearing at 25 in a wall 14 of the casing; a collar 26 being provided on the shaft to prevent its endwise movement. The shaft 24 extends exteriorly of the casing and is provided with a squared end 27 for detachably receiving a sprocket wheel 28 thereon. The sprocket

wheel 28 may be removable and may be placed along the shaft 27 at desired distances by means of the provision of a set screw 29, to accommodate the portable recording apparatus to various sizes and types of telegraph instruments. Within the compartment of the casing the shaft 24 has a bevel gear 28 which meshes with a bevel gear 29 supported upon a shaft 30. It is to be noted that the shaft 24, beyond the gear 28, is supported by a bearing bracket 31. The shaft 30 is supported at its ends within the casing by means of front and rear bearings 33 and 34, respectively carried by the top wall 12 and rear wall 11. The shaft 30 is arranged at right angles to the shaft 24, and the bevel gear 29 is keyed on the shaft 30 between its ends.

A bar 38 is supported at 39 within the casing upon the side walls 14, and slidably supports thereon a marker supporting bracket 40. The bracket 40 is riveted at 41 to a straight rack 43, which receives a gear 44 in tooth meshing relation thereon; the gear 44 being keyed upon the shaft 30. A spring 45 carried by the rack 43 engages the top of the guide bar 38 to frictionally hold the bar or rack 43 in position against accidental movement. A detachable marker support 46 is secured detachably upon the slidable bracket 40, by means of a thumb nut 47 which adjusts upon a screw 48 carried by the slide bracket 40; releasable pins 48^a being provided upon the marker support 46 and engaging in the bracket 40 (not shown) for assisting in holding the marker support 46 in place detachably. The marker support 46 is provided with depending spaced legs 49, pivotally receiving at 50 therebetween the upper end of the marker shank 51 which depends substantially vertically downwardly in the compartment of the casing at the front thereof, and may swing on the pin 50. A spring 52 is pivotally secured at 53 at its upper end on the marker support 46 and is bowed outwardly and downwardly and at its free end engages the shank 51 below its pivot for normally forcing the scribing element 55 at the lower end of the marker 20 into engagement against the recording tape 22. The spring 52 may be turned for a half turn on its pivot 53 out of engagement with the marker shank 51 so that the same may be swung outwardly. In order to insure the swinging of the marker arm outwardly away from the tape when the spring 52 is thus actuated, a second spring 58, secured at 59 on the rear of the marker support 46, engages with less force against the marker shank 51 than the front spring 52, and swings the marker arm counter to the spring 52. Of course, the spring 52 has the greater force, as is apparent from Figure 2, and it is only when the force of the spring 52 is released from the marker shank that the spring 58

comes into play and swings the marker away from the tape.

The marker 20 is provided with a ring or support 60 at the lower end thereof for detachably supporting an inkwell 62 into which the scribing element 55 extends; receiving a supply of ink therefrom, which by capillarity follows the scribing element 55 and marks a line upon the chart tape 22 as the same moves.

A tape supporting roll 65 is provided, at a position in the rear of and above the lower scribing element on the marker 20, upon which the tape or paper 22 is rolled in any approved amount. Plates 66 and 67, preferably of metal, are secured at 68, see Figure 2, upon the ends of the roller; these plates 66 and 67 having bearing extensions 69 centrally thereon, provided with conical or tapered recesses 70.

Within the casing 10 there is a partition 72 dividing the tape and recording compartment from a compartment 73 wherein the clock or winding mechanism is received. On this partition 72 is disposed a screw bearing 74 adjustably placed thereon by means of nuts 75 at opposite sides of the partition; the stub bearing 74 having a conical end adapted to slidably sit in the socket 70 at one end of the roll 65. In like manner a bearing screw 80 is threaded into the wall 14 in which the shaft 24 bears, and locked in adjustable relation in place by a nut 81; the said bearing screw 80 having a conical end adapted to seat in the socket 70 of the other bearing extension 69 of the roll 65. This screw 80 has a head 83 extending exteriorly of the casing for adjusting purposes.

The recording material 22 may be of paper, or the like, and it is preferably referred to as tape. It is of novel construction, and includes marginal side portions 83 and 84 provided with uniformly spaced perforations 85 therealong to aid in the feed of the paper in a uniform timed relation, as will be subsequently described. The tape is longitudinally divided into preferably ten spaces 86 of uniform width, which are suitably marked to designate the position of the telegraph instrument control handle. Thus, three of the spaces, to the extreme left, are intended to be marked "Astern," Full—Half—Slow. The next three to the right are respectively marked "Finished Engines"—"Stop"—"Standby". The next three spaces to the right are designated "Ahead", Slow—Half—Full, and the extreme right hand longitudinal space is marked "Time" and is used for recording in suitable manner the starting time at the proper horizontal line, and also facilitates the reading of the time of a given order on the chart. The chart is horizontally divided into ten minute series or spaces, each space having ten subdivisions. Thus, the lines 88 which extend clear across the space

from margin 83 to margin 84 are the only lines which intersect the longitudinal time space at the extreme right, and the space between these lines 88 has ten subdivision lines 89 uniformly spaced, and the spaces provided thereby each designating a minute.

The tape is adapted to extend downwardly through the compartment from the roll 65, and it is guided exteriorly of the casing 10 by means of guide plates 90 providing a slot aligning with the slot 91^a thru the bottom wall 13, as shown in Figure 2 of the drawings.

The feed means 91 for feeding the tape off the supply roll 65 in uniformly timed relation preferably comprises a rotatable cylinder 92 having end plates 93 attached thereto, and providing hollow bearing extensions 94 rotatably supported in bearing brackets 95 which are carried by the bottom wall 13 of the casing 10, as shown in Figure 5 of the drawings. A shaft 97 extends axially thru the cylinder 92, and rotatably through the extensions 94; at its left end being suitably connected as at 97^a to operating mechanism, in the nature of clockwork, to cause a rotation of the shaft 97. The shaft 97 is freely rotatable in the roller 92 and is longitudinally movable therein. At its left end it extends through the partition 72 and is there provided with a bearing 100. A collar 101, shown in Figure 3, prevents end movement of the shaft 97. At its opposite end the shaft 97 is provided with clutch means to releasably connect the same to the roller 92. This clutch means includes the end projecting from the casing, which is provided with a clutch head 105 thereon, shown in Figures 4 and 6 of the drawings, which is provided with an annular series of recesses or openings 106 therein facing outwardly. A second clutch part 107, in the nature of a shallow cylindrical shaped box, is provided with a sleeve 108 splined at 109 on the extension 94, to insure that the clutch part 107 will rotate at all times with the roller 92. The clutch part 107 of course extends exteriorly of the right hand wall 14 of the casing 10, as does also the clutch part 105 on the shaft 97. A detachable cap 110 is connected at 111 exteriorly upon the clutch part 107, being provided with projections 112 within the clutch box, which are adapted to slide into and out of the openings 106 on the clutch part 105, to effect the clutching action. The roller body 92 is provided with pins 115 circumferentially thereabout, in uniformly spaced relation at each of the ends thereof, adapted to extend into the perforations 85 of the tape 22 for feeding the latter upon rotation of the roller.

As a means of insuring that the tape 22 will bear against the roller 92 and that the pins thereof will positively grip in the tape to cause a positive feed at all times, it is preferred to provide a rubber roller 117, rotatably supported at its ends 118 on oscilla-

tive brackets 119, which are secured at their lower ends on a rotatable rod 120; the latter being rotatably supported in the right hand wall 14 and in the partition wall 72, as shown in Figure 3 of the drawings. Springs 122 normally engage the swinging brackets 119 between their ends and forces the rubber roller 117 against the face of the tape 22 for the purpose above mentioned. Of course the roller 117 is of maximum diameter, or in length equal to the distance between the margins 83 and 84, that is, the portion of maximum diameter does not overlap the perforations 85, so as to interfere with the extension of the pins 115 therein.

A swinging table or plate 125 is provided as a backing for the scribing element 55. This plate 125 is pivoted at 126 on a shaft which bears in the partition wall 72 and right hand wall 14 of the casing 10. The plate 125 extends upwardly and at its upper end it may be weighted. The plate 125 may be curved throughout its height. It is adapted to engage against stop projections 128 at its upper end; the stop projections being secured on the inside surface of the wall 14 of the partition 72. Friction springs 130 normally engage the plate or table 125 at opposite sides thereof to hold the plate in position.

The recorder is installed by securely fastening the casing 10 to the telegraph standard by means of straps 140, which are detachable in nature. With the telegraph indicating "Stop" as shown in Figure 1 the pen arm or marker 20 is moved to a central position with respect to the chart 22 and the connecting chain 141 is then placed over the sprocket wheel 28 and over a sprocket wheel 142 keyed to the operating shaft 12 of the instrument. With the nut 80 released, a roll of paper is inserted into the bearing 74 and the nut 80 then tightened so that the roller 65 may rotate easily. The curved backing plate 125 is then swung back into place. The part which comprises the clutch box 107 is then pulled outwardly to release the roller 92 from clutching engagement with the shaft 97 and the paper is then brought down over the drive roller 92 so that the perforations in the margin of the paper receive the spikes or guide pins 115 and the paper is fed downwardly through the slot 91^a to the desired extent, either with the clutch out, or by letting the clutch parts in engagement and turn the knob 107. The knob forming the box 107 is pushed in to engage the projections 112 in the socket 106 and this keys the roller 91 with the shaft 97. The shaft 97 is of course driven by suitable mechanism in the compartment 73 above described. With the scribing element of the marker in position against the tape 22 as above described, and the clockwork in operation, the paper or tape 22 will be slowly fed downwardly in a uniformly timed relation. The arrows 150 indi-

cate the position at which the scribing element operates on the tape. The spaces between the separating lines 89 are wide enough to accommodate five orders thru which the telegraph instrument is used in a minute's time. It is quite apparent that as the operating handles 13 are swung to indicate the various orders on the dial 11, the marker arm 20 will be moved back and forth over the downwardly moving tape 22 to record the order thereon in the proper longitudinal space 86. The time is of course indicated by the horizontal spaces in a relation which is perfectly apparent. The reason that the tape is not rolled up after use, in the casing, is that it is desirable to use the same for reports, etc. at a time immediately after a predetermined series of orders have been issued, as will be quite apparent to navigators and the like.

Various changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In recording mechanism of the class described a supporting frame, a marker movably supported by the frame including a pivoted arm, a scribing element supported by the pivoted arm, a chart, spring means normally urging the arm so that the scribing element engages the chart in an operating relation thereon, and spring means operating on the arm counter to the first mentioned spring means but of less effectiveness than the first mentioned spring means whereby when the first mentioned spring means is released from its operation on the arm the latter will move so that the scribing element will move away from said chart.

2. In a ship recorder a casing, a transverse bar supported therein, a bracket slidable across the bar, a marker pivoted to the bracket, spring means urging the pivoted marker in opposite directions, one spring means being stronger than the other, and a chart in the casing receiving the marker thereagainst as urged by the stronger spring means.

3. In a ship recorder, a pivoted marker, spring devices operating on the pivoted marker to urge it in opposite directions, one spring device being stronger than the other, and a scribing surface receiving the marker thereagainst as urged by the stronger spring.

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