Dec. 12, 1939. H. L. KRUM ET AL 2,183,022

MARKET QUOTATION SELECTOR

Original Filed Jan. 9, 1936 3 Sheets-Sheet 1

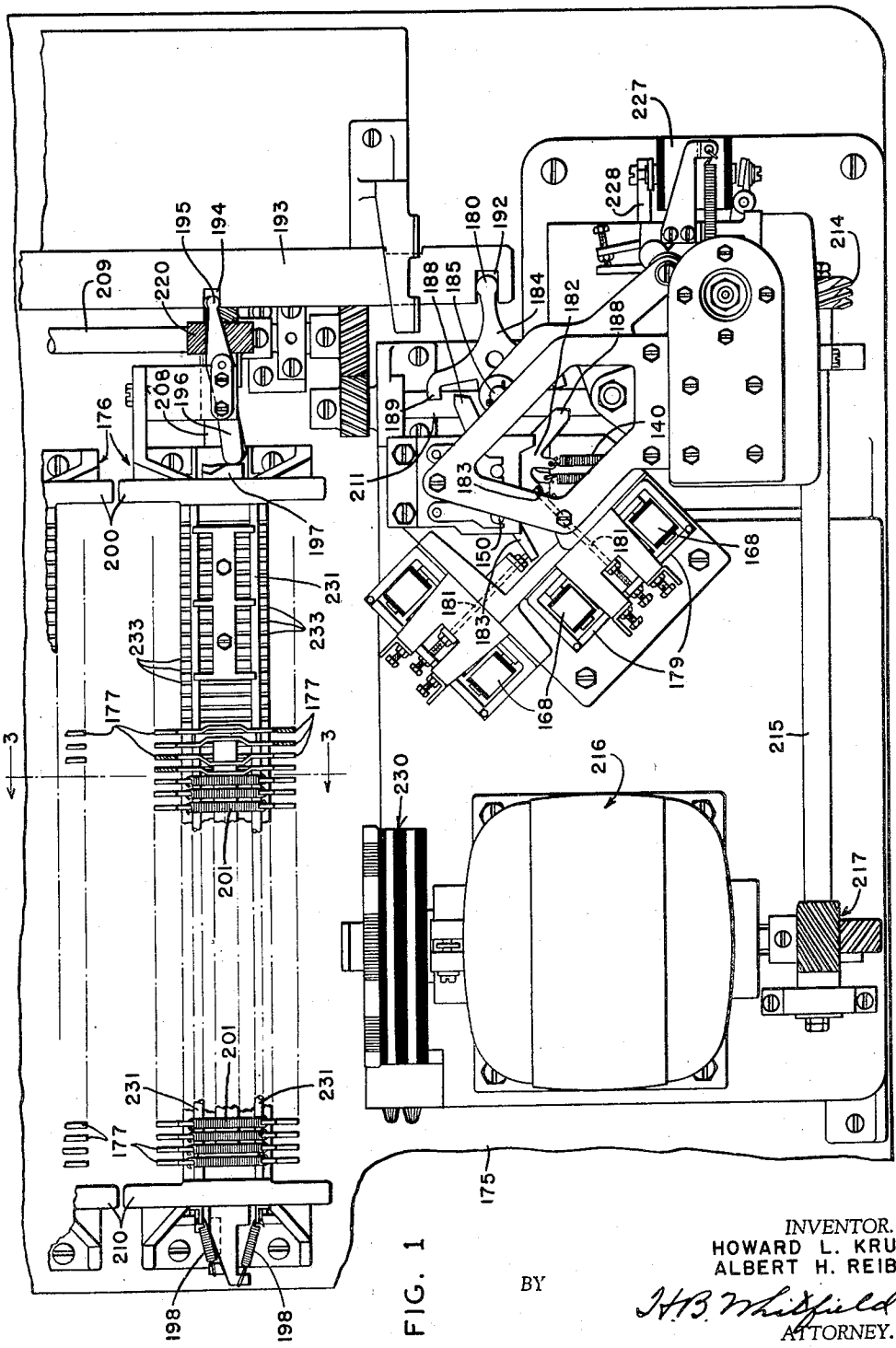


FIG. 1

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Original Filed Jan. 9, 1936 3 Sheets-Sheet 2

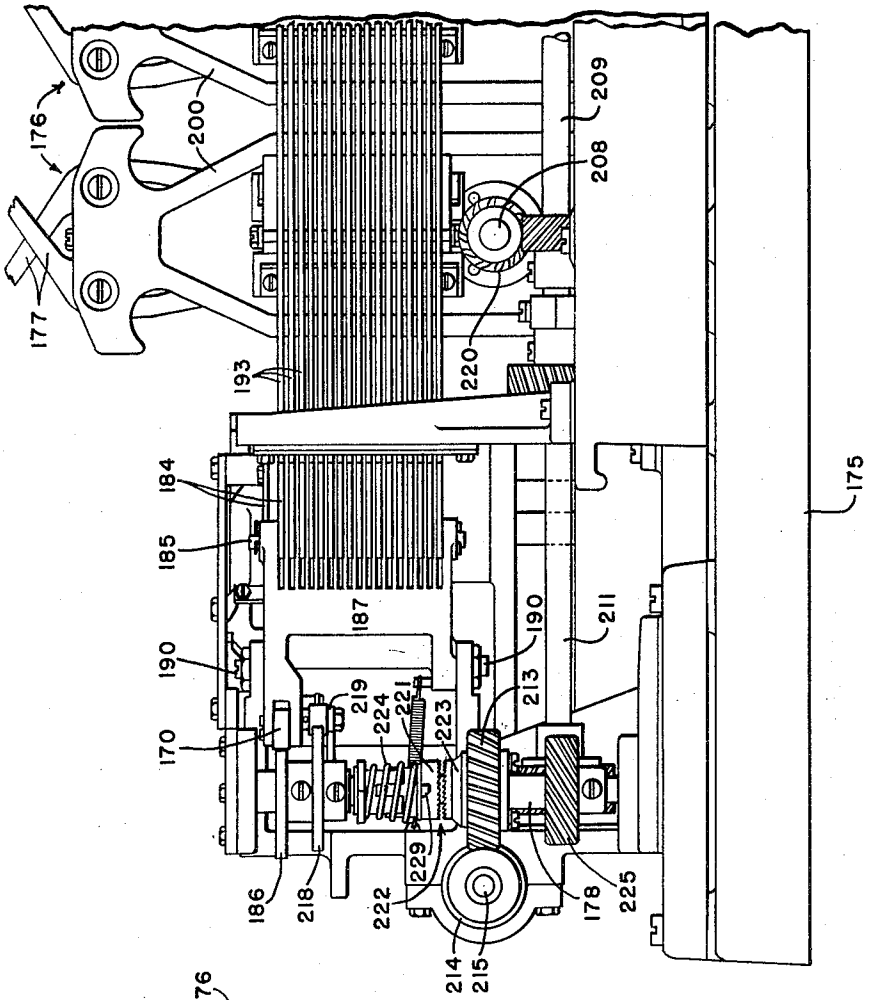


FIG. 2

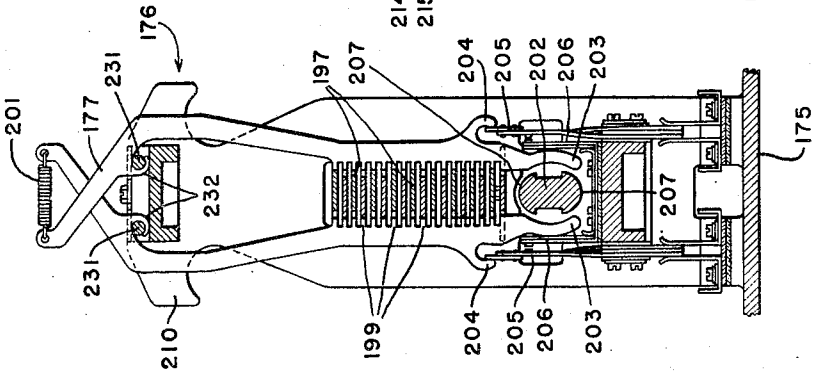


FIG. 3

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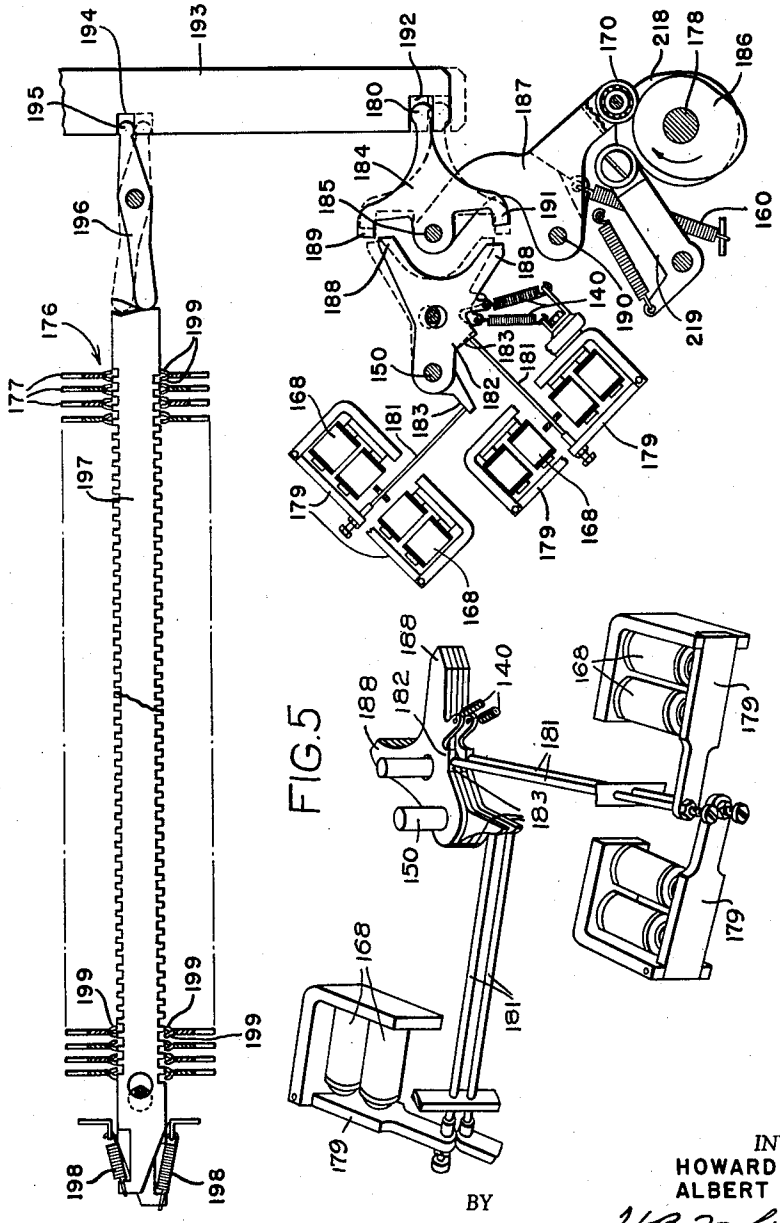
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FIG. 4



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UNITED STATES PATENT OFFICE

2,183,022

MARKET QUOTATION SELECTOR

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Original application January 9, 1936, Serial No. 58,340, now Patent No. 2,147,656, dated February 21, 1939. Divided and this application December 14, 1936, Serial No. 115,760

6 Claims. (Cl. 177—353)

The present invention relates to telegraph signaling apparatus and more particularly to selecting mechanisms adapted especially to stock quotation systems.

The present application is a division of copending application Serial No. 58,340, filed January 9 1936, Patent No. 2,147,656, dated Feb. 21, 1939, and reference may be had thereto for a more complete understanding of transmitting and receiving systems wherein signals especially adapted to the supervision and operation of mechanisms of the present invention are employed.

The principal object of the present invention is the provision of a unitary structure embodying the features of compactness, interchangeability of component selectable elements, and adaptability to structural enlargement to accommodate a comparatively large number of selective possibilities.

The disclosed embodiment features a supporting base which may be of variable length to accommodate a predetermined quantity of parallelly disposed sub-units. A motor driven main operating shaft carries several power distributing elements and a number of selector bars are parallelly disposed corresponding to the sum total of all of the selecting impulses which relate to several conventional start-stop signals. A corresponding number of magnets which may be energized by a suitable distributor impart a mechanical setting to a like number of principal storage elements. From these, the setting is communicated to parallelly arranged connector bars by means of a group of transfer levers which are simultaneously reciprocated by a cam carried by the aforementioned operating shaft.

The sub-units mentioned above consist of limited groups (having one hundred selectable elements in the instant embodiment) which are disposed perpendicularly with respect to said connector bars, and each has a number of selector bars which are set through the medium of a plurality of links which articulate the sub-unit selector bars with the connector bars. A sub-unit spreader cam is supported beneath the alignment of selector bars and functions to restore cyclically any one of them following its selection. The several spreader cams are operated together from a common operating shaft which extends parallelly of the aforementioned connector bars and is driven by the main operating shaft.

Each sub-unit supports a limited number of individually selectable elements which are pivotally suspended in a criss-cross alignment and which are spring urged into selective position, toward the stack of selector bars. Preferably each selectable element is provided with teeth individually arranged with respect to relative offsetting or notching, while the selector bars are provided with uniform notch and lug attributes so that the code characteristic is inherent in the selectable element, affording thereby a freedom of interchangeability with respect to the selectable elements of each sub-unit as well as with those of other sub-units. When a selective disposition of the code bars favors a particular selectable element, it is permitted to move into so-called selected position following the recession of its spreader cam at which time a lug appendaged thereof closes a contact pair establishing or preparing an individual circuit over which price signals are routed thereafter.

For a more comprehensive understanding of the present invention, reference may be had to the more detailed description following hereinafter and to the accompanying drawings wherein like reference characters represent similar parts throughout and wherein;

Fig. 1 is a plan view of a selector mechanism having embodied therein principles of the present invention. In this figure certain portions have been broken away to reveal the underlying structure;

Fig. 2 is a side elevation of the mechanism featured in Fig. 1;

Fig. 3 is a transverse sectional detail view of one of the vertical tiers which comprise a sub-unit of the mechanism featured in Fig. 1 and is taken approximately on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary plan view of certain of the operating elements featured in the selector mechanism of Fig. 1, and;

Fig. 5 is a perspective view of a portion of the selector mechanism featuring the staggered arrangement of the magnets.

The embodiment featured herein is contemplated for use with a receiving distributor having the characteristics featured in the above referred to application. Particularly is it adapted to the use of five unit start-stop permutation code signals wherein three stock selecting signals are employed giving a total of fifteen principal component selecting elements. In addition to the fifteen selector bars, two additional bars are provided whose selection represents a secondary preference such as is sometimes termed "first preferred", "second preferred", "common", etc., so that in accordance with a given stock designation, various subordinate classifications may be

independently distinguishable one from another. Preferably the signals are momentarily stored in a group of storage relays from which they are transferred to the stock selector magnets 168. An arrangement illustrating this is disclosed in the aforementioned parent application, Serial No. 58,340.

As indicated in the accompanying drawings, the stock selector unit includes a set of compactly arranged selector banks or sub-units 176 which are mounted on a base casting 175. The number of these sub-units which may be employed at any particular station is dependent, of course, upon the number of stocks which it may be desired to serve. In accordance with the operating principles of the unit about to be described, it has been found that five hundred or more selections may be conveniently accommodated by the arrangement of the tiers 176, each one of which contains one hundred individually selectable elements 177. In other words, an infinite number of tiers may be arranged parallelly, as shown, consistent with the inherent mechanical limitations of the arrangement. It has been definitely established by experiment that at least five such tiers may be associated within a single assembly and driven from a common source as will be presently explained.

Magnets 168, seventeen in number, are staggered as indicated in Figs. 1, 4 and 5, so as to permit their close grouping about the region of the transfer elements and pivot shaft 150. The energization of each magnet 168 causes the attraction of its armature 179 and moves setting needle 181 inwardly so as to engage and shift its corresponding selector lever 182. It will be particularly noted that alternate ones of the selector levers 182 are similarly shaped and that they differ from the intervening ones in slight detail, viz; the location of the contacting surface 183. This feature is designed to conform with the staggered arrangement of the magnets 168. In opposition to the influence of magnets 168, each setting lever or selector lever 182 is instantly returned to normal position by a spring 140 upon the deenergization of its associated magnet 168. Accordingly, the energized or deenergized condition of each magnet 168 is manifest upon its associated selector lever 182 during the signal relaying period resulting in the disposition of each selector lever either as indicated in solid or as in dotted lines in Fig. 4.

A set of T-shaped transfer levers 184 comprising one for each of the selector levers 182 is carried upon a common shaft 185, which in turn is supported at its ends by a bail lever 187 pivoted on the trunnion screws 190. A spring 160 is connected to an ear which extends from bail lever 187 urging the latter in a clockwise direction, as viewed in Fig. 4 about its pivots 190 and causing the follower roller 170 thereof to engage the periphery of a cam 186 on shaft 178. Upon the rotation of shaft 178, cam 186 causes rocker bail 187 to be reciprocated about its pivots 190 so that the assembly of transfer levers 184, which are pivotally carried upon shaft 185, are thrust against the selector levers 182. When this happens, one or another of the transfer lever lugs 189 or 191 coming into engagement with its related transfer lever 182 at either of its shouldered extremities 188, causes said transfer lever 184 to yield and rotate in a related direction and in accordance with this, the transfer lever disc 180 is moved in a corresponding direction. Since the discs 180 maintain an articulate relationship with the sockets 192, the transverse connecting bars 193 are correspondingly shifted, and the latter, through the disc and socket connections 194 and 195, impart a shift operation to each of the oscillatory levers 196.

The opposite ends of each of the reciprocable levers 196 are rounded and thereat engage a cammed end surface of a selector bar 197 whose edges are studded with regularly occurring lugs and intervening equally spaced notches. All of the selector bars 197 of a tier 176 are aligned vertically and constitute a parallel stack. Each bar is provided with a spring 198 which tends to maintain said bar in its right-hand position as viewed in Fig. 4. This condition is permitted only during the time in which reciprocating lever 196 is in its clockwise extremity as indicated in dotted outline, Fig. 4, but when in its counterclockwise position, as indicated in solid outline, the round extremity of reciprocating lever 196 urges against an extending cam surface on the end of selector bar 197 shifting the latter to the left and in opposition to its individual return spring 198. In this manner, the condition of the seventeen selector bars 193 is always impressed upon each of the stacks of selector bars 197 establishing a uniform selecting condition throughout the entire system.

As has been said, for each arrangement of the seventeen selector bars, an individual selectable element is conditioned to the exclusion of all of the other selectable elements. In a system employing seventeen selector bars, the total number of selectable elements which may be thus served is equivalent to two to the seventeenth power or 131,072. For each cycle of operation or permutative selection, a certain disposition of the seventeen bars 193 is made, causing an alignment of notches somewhere in one of the tiers 176 among the selector bars 197 which will correspond to the individual arrangement of lugs 199 upon one of the selectable elements 177, permitting the latter to be moved into its selected position which, as will be described later, will be moved inwardly under the influence of its spring 201. For each of an oppositely disposed pair of selectable elements 177, a single interconnecting spring 201 is provided, while a pair of transverse rods 231 serve as pivots about which the two alignments of bars are suspended in grooves 233 between end frames 200 and 210. A spreader cam 202 is located beneath the stock of selector bars 197 and between the lower extremities 203 of the selectable elements 177. The several spreader cams 202 are indicated as being integral with the transverse shafts 208 which are suitably journaled in the end frames 200 and 210, and which are provided with the driven gears 220. The normal position of each spreader cam 202 is at 90° from that indicated in Fig. 3, at which time the selectable elements 177 are cammed outwardly a sufficient distance to permit selector bars 197 to be shifted clear of the lugs 199.

When in the position indicated in Fig. 3, however, cam 202 permits the selectable elements 177 to come into engagement with the selector bars 197, and when this occurs the lugs 199 may avoid the lugs of selector bars 197, in accordance with the particular disposition and selectable element 177 will be permitted to rock about its shaft 231 until the hook portion 204 thereof is enabled to close the contact pair 205—206. The closure of this contact pair prepares an individual routing circuit in a manner more clearly described in the parent application permitting the recorda-

tion of price or so-called answer signals on a selected indicator.

Following the recording operation, cam 202 resumes its original position whence its cam surfaces 207 reengage the curved projection 203 of the selected element while also spreading the other elements into their distended positions.

It should be noted that selectable elements 177 thereof that are oppositely disposed in transverse alignments are nevertheless of similar shape and configuration excepting the disposition of their code lugs. For this reason any selectable element 177 is capable of being inserted into position on any tier 176 and on either side thereof. The notches upon the selector bars 197 are of regular or equally spaced occurrence, while the lugs 199 of the selectable elements 177 are bent some rightwardly and others leftwardly in an individual manner that characterizes each element. Accordingly, the construction permits of unrestricted interchangeability of the elements 177 because the location of any one of them is not dependent upon any predetermined features of the unit.

The transverse shafts 208, Figs. 1 and 2, are driven from a common operating shaft 209, which is located parallelly with respect to and just below the connecting bars 193. Shaft 209 is driven by a short drive shaft 211 which in turn is geared at 225 to the vertically presented main operating shaft 178. The latter is driven through a toothed driving clutch 222, the driving element 223 of which is continuously rotatable with the driven gear 213, and the latter, in turn, is actuated by a worm gear 214 which is carried upon the end of the intermediate drive shaft 215. A motor 216 having a suitable speed regulator 230, drives intermediate shaft 215 through gear pair 217. A speed regulator adaptable to this purpose is shown and described in U. S. Patent No. 1,306,072 issued to B. F. Merritt. Shaft 178, which has been referred to as the vertical operating shaft, carries the rocking bail operating cam 186, which functions to reciprocate the transfer bail 187, as aforedescribed, and to thereby execute a signal transfer of all of the selective conditions established in the several selector levers 182 to their corresponding connecting bars 193. Another cam 218 also on shaft 178, Fig. 4, cooperates with a detent jockey 219 and acts to maintain shaft 178 in a dormant or quiescent condition during the clutch disengagement period by withholding the teeth of driven member 221 from clashing with those of driving member 223. This jockey 219 resists counterclockwise rotation of the driven assembly which includes shaft 178, such rotation being mildly urged by the spring 224 in forcing member 221 downwardly and through the beveled lug 229 against a similar bevel on the cooperating surface of armature 228, Fig. 1. Upon the release of armature 228, the movement of member 221 is permitted in a vertical direction.

As stated before, shaft 178 is driven by intermediate shaft 215 and has secured to it the driving gear 225 which actuates drive shaft 211. At its upper extremity shaft 178 carries the transfer bail operating cam 186 and the anti-gnash cam 218 as well as the longitudinally slidable driven portion 221 of clutch 222. When motion is imparted to the shaft 178 through clutch 222, the entire assembly including the cams 186 and 218 and the gear 225 is rotated together imparting movement to shafts 209, 211 and spreader cam shaft 208.

The disengagement of clutch 222 is subjected to the electrical control of a magnet 227, Fig. 1, whose armature 228 carries at its free end a beveled projection (not shown) which is adapted to engage and cam out the beveled lug 229, Fig. 2, integrally formed with the driven portion 221 of clutch 222. During the deenergized condition of magnet 227, a spring (not shown) withdraws its armature 228 at which time the beveled portion on said armature is effective upon lug 229. Instantly upon the energization of magnet 227, armature 228 is attracted withdrawing its projection from engagement with lug 229 and permitting the floating portion 221 to come into engagement with the driving teeth of clutch element 223.

Each stock or commodity selecting element having a particular code combination may be identified by suitable surface markings or by recognizing and distinguishing between the several of its lugs 119 which corresponds to the three principal selecting signals. To remove any element 177 from its position, it is but necessary to disconnect it from spring 201 after which it may be pulled directly upward and inwardly until its claw 232 clears transverse rods 231. Thereafter the element may be slid out of its slot 233 in the frame and any other element replaced in its stead. This interchangeability of elements 177 permits of a practice of quickly and easily delegating a given position in an arrangement of stock indicators to any desired stock.

While the present invention has been explained and described in contemplation of a specific embodiment, it is to be understood that numerous modifications and variations may be made without departing from the spirit thereof. Accordingly, it is not intended to be limited in any way by the details of the accompanying drawings nor by the language of the foregoing description, except as indicated by the hereinafter appended claims.

What is claimed is:

1. In a selecting unit, a plurality of longitudinally arranged bars each corresponding to an element of a signal code, a plurality of sets of notched selector bars arranged perpendicularly with respect to said longitudinal bars, the bars in each set corresponding in number to said longitudinally arranged bars, means for shifting said longitudinal bars into alternative positions in accordance with the alternative conditions of signal elements, transfer members for communicating the shift condition of said longitudinal bars to their associated notched selector bars simultaneously, and a plurality of selectable elements divided into sets, each set being associated with one of said sets of notched selector bars and individually conditioned by certain dispositions of said notched bars.

2. In a selector, a plurality of selectable bars, means for supporting said bars in horizontal alignment, a plurality of alternately criss-crossed individually selectable elements, supports for vertically suspending said elements to cooperate with said selector bars, means arranged between adjacent elements of a pair thereof for normally urging said selectable elements against said bars, and a spreader cyclically rotatable for withdrawing said elements and for resetting a selected one of them.

3. In a selector, a series of selector bars corresponding in number to the several signal elements of a predetermined plurality of signals, a series of setting members mounted on a common pivot and each associated with one of said bars, a cyclically rotatable shaft, means carried by said

shaft for reciprocating said setting elements, a corresponding series of code signal transfer elements each associated with one of said setting members, consecutive ones of said setting members having radially presented surfaces in alternative angular positions, electromagnetic means for setting said transfer elements including armatures, and means associated therewith for cooperating with said radial surfaces, said alternative angular arrangement permitting of corresponding alternative staggering of said electromagnetic means.

4. In permutation code selector mechanism, an arrangement for permitting of the close placement of notched selector bars comprising in combination, a set of code selector bars stacked parallelly, a corresponding set of transfer levers similarly stacked through which said code bars are operated, a corresponding set of members to be engaged by said transfer levers for receiving a setting, said members being similarly stacked to said bars and levers, motor driven means for moving said transfer levers to engage said members and for thereby imparting a permutative code positioning to said set of code selector bars, individually conditionable means responsive to the permuted placement of the notches in said selector bars, shoulder portions on said members with the shoulder portions of contiguous members in varying angular positions, and signal responsive electromagnets having armatures staggered to correspond each to each with said shoulder portions and angular positions of their associated ones of said members.

5. In a selector, a plurality of sets of selecting members having notch and lug attributes, a set of transfer levers for each set of selecting members, motion distributing means common to said selecting members and said transfer levers, signal responsive means, means operated in accordance with said signal responsive means for permutably setting said motion distributing means to move said transfer levers and the selecting members associated therewith, and a plurality of selectable devices for each set of selecting members, each device capable of being associated with and operated by any of said sets of selecting members upon each permuted setting of said selecting members.

6. The combination set forth in claim 5 in which said common motion distributing means comprises a tier of parallel bars associated with the respective sets of said transfer levers at points opposite said sets of selecting members.

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