Dec. 1, 1925.

1,563,906

E. E. KLEINSCHMIDT

BALL STORAGE TRANSMITTER

Filed July 9, 1923

2 Sheets-Sheet 1

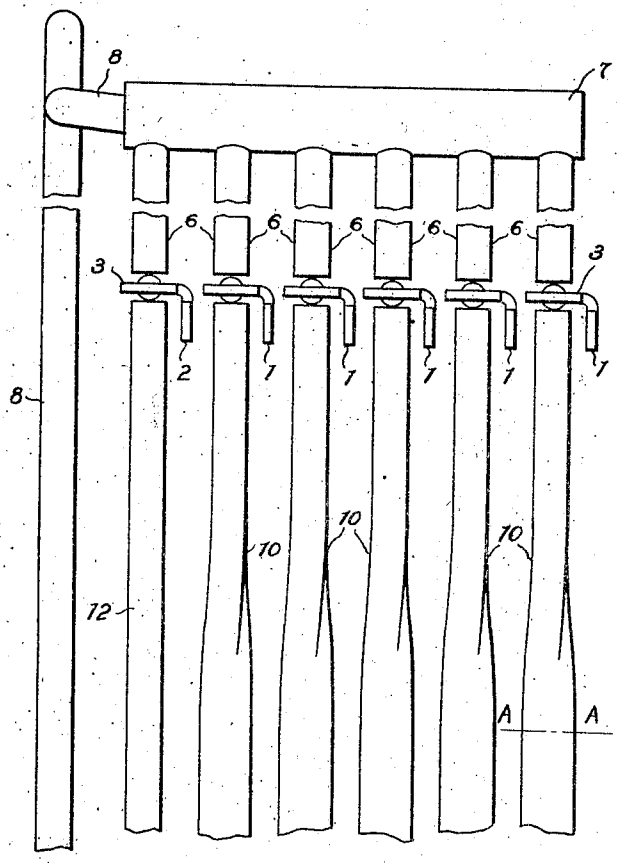


Fig. 2

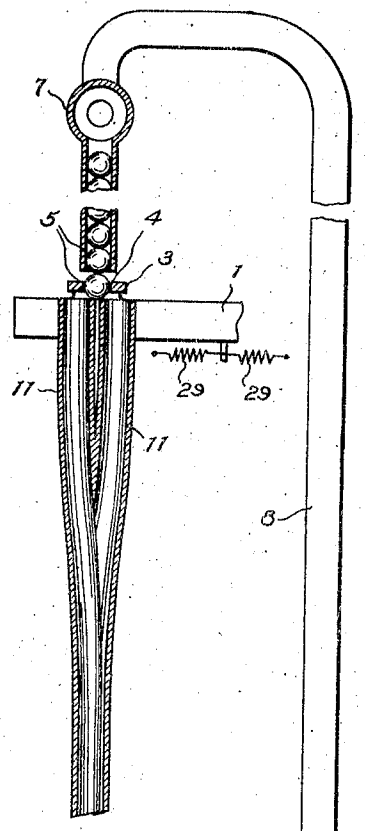


Fig. 1

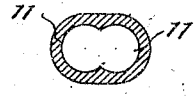


Fig. 3

INVENTOR
Edward E. Kleinschmidt
BY
William A. Strauch
ATTORNEY

Dec. 1, 1925.

E. E. KLEINSCHMIDT

1,563,906

BALL STORAGE TRANSMITTER

Filed July 9, 1923

2 Sheets-Sheet 2.

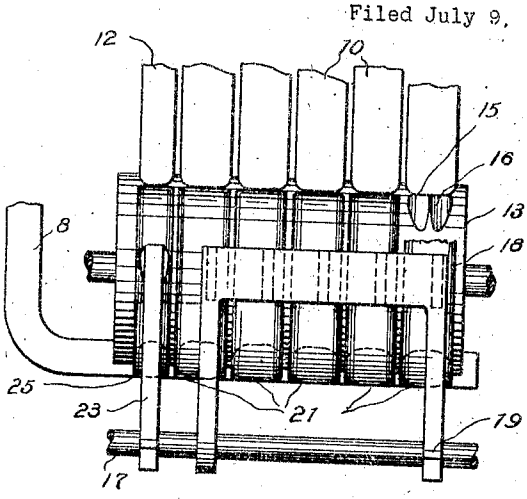


Fig. 4

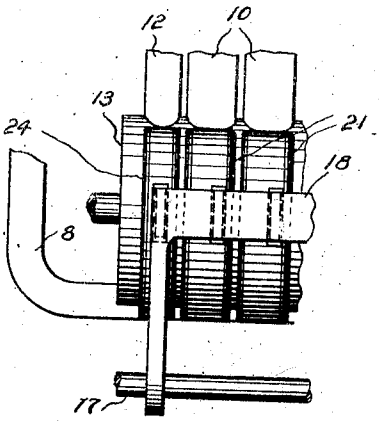


Fig. 6

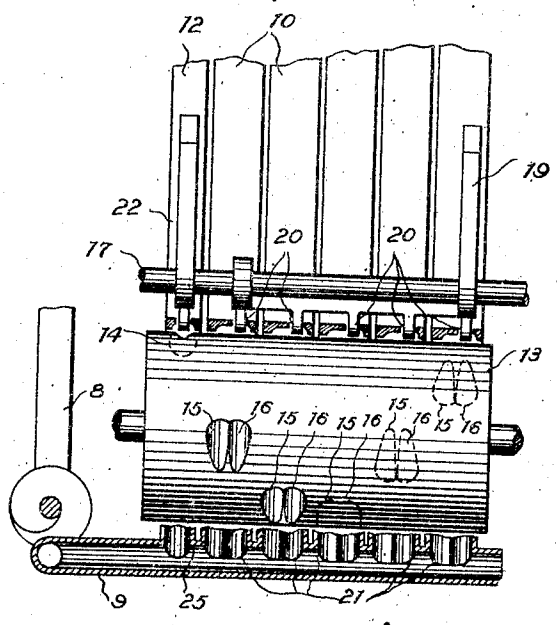


Fig. 5

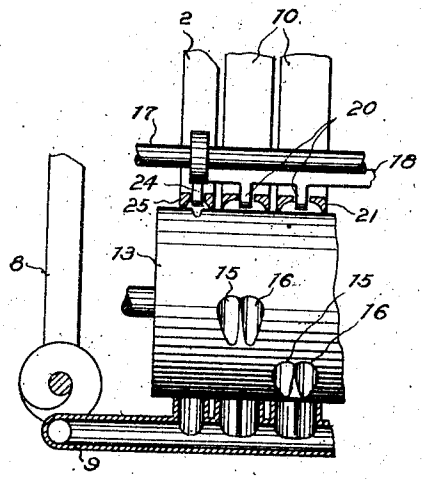


Fig. 7

INVENTOR
Edward E. Kleinschmidt
BY
William A. Strauch
ATTORNEY

Patented Dec. 1, 1925. 1,563,906

UNITED STATES PATENT OFFICE.

EDWARD E. KLEINSCHMIDT, OF LONG ISLAND CITY, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MORKRUM-KLEINSCHMIDT CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

BALL STORAGE TRANSMITTER.

Application filed July 9, 1923. Serial No. 650,320.

To all whom it may concern:

Be it known that EDWARD E. KLEINSCHMIDT, a citizen of the United States, residing at Long Island City, in the county of Queens and State of New York, has invented certain new and useful Improvements in Ball Storage Transmitters, of which the following is a specification.

This invention relates to transmitters for sending code combinations of electrical impulses particularly useful for the transmission of signals in printing telegraph, fire alarm, and selective signaling systems.

More particularly the present invention is an improvement in ball transmitters of the type disclosed in copending application Serial Number 521,394, filed December 10, 1921. Due to the inertia, the time required for the balls to drop into position on the rotating wheel is too long to permit of high speed signaling when a single file of balls is utilized to send a code combination. The objects of the present invention are to overcome this defect of the transmitter disclosed in the copending application, to provide a high speed ball storage transmitter, and such other objects as will appear in the detailed description of a preferred embodiment of the invention of which,

Figure 1 is a side elevation partially in section.

Figure 2 is a fragmental front elevation of the upper part of the transmitter.

Figure 3 is a sectional view taken along line A—A of Figure 2.

Figure 4 is a fragmental plan view of the lower part of the transmitter showing a form with a special start contact.

Figure 5 is a front elevation of the part shown in Figure 3.

Figure 6 is a fragmental plan view of a single contact form.

Figure 7 is a front elevation of the part shown in Figure 5.

The permutation bars 1 and start bar 2 are actuated by the usual form of keyboard, tape, or perforated card control in any well known manner to set bars 1 in various combinations and to uniformly operate start bar 2. Each of the bars 1 and 2 is provided with an extension 3 with a perforation 4 just large enough for the balls 5 to pass through. Arranged above the centers of movement of perforations 4 are a plurality of feed and storage tubes 6 of an internal diameter just large enough to permit free passage of balls 5. Tubes 6 communicate with a feed chamber which is inclined downward from left to right in Figure 2 so that balls fed into 7 at the left will roll into and fill up tubes 6. Communicating with chamber 7 is a feed tube 8 which terminates in a section 9 (Figures 5 and 7).

Below each of the bars 1 is a signal storage tube 10, made up at the top of two separate tube members 11 with the inner walls thereof directly beneath the center of tubes 6 as shown in Figure 1. Tubes 11 gradually are merged until the section shown in Figure 3 without a dividing wall is attained. A single tube 12 is provided beneath start bar 2.

Tubes 10 and 11 extend downward until they substantially abut against a cylinder 13 which has pockets 14, 15, and 16 cut therein in a manner to register with the openings in tubes 12 and 10 respectively, so that balls from the tubes will be picked up by the respective pockets and carried around by rotation of 13. Cylinder 13 is rotated at a uniform rate of speed in any well known manner, and the pocket 14, 15, and 16 are so arranged that pocket 14 will pass by its tube 12 first and thereafter double pockets 15 and 16 will pass by their respective tubes 10 successively and at uniform intervals until five balls have been picked up by the pockets 15 or 16 according to their position in the tubes.

Pivoted above cylinder 13 on a suitable support 17 is a universal operating bar 18 adapted to rock a contact arm. Bar 18 has a plurality of lugs 20 which extend downward through openings in guides 21 in a position to be engaged by balls 5 carried in pockets 16 only of cylinder 13.

A separate start contact 22 (Figures 4 and 5) operated through arm 23 and lug 24 extending through an opening in guide 25, by balls carried in pocket 14 may be provided. Or as shown in Figures 6 and 7, universal bar 18 may be extended to carry lug 24 and contact 19 may thus be utilized to send all of signals.

Contacts 19 and 22 are normally held against a back or spacing contact 25 by means of a spring 26 and when actuated by a ball, it is thrown against a front or mark

ing contact 27 to send a marking impulse from battery 28 to the line.

In operation bars 1 are shifted to the right and left (Figure 1) in accordance with the signal to be transmitted. This movement will shift balls 5 resting in perforations 4 of bars 1 in a manner to cause them to drop into the right or left passage 11 of the respective tubes 10. The balls fall by gravity through the tubes 10 until they abut against rotating cylinder 11 and are picked up in order by pockets 15 or 16. Bar 2 is shifted to drop a ball into single tube 12 each time the bars 1 are shifted. As soon as the bars have dropped the balls into the proper passages they may be released and restored to central position by means of springs 29 individual to each of the bars or in any other suitable manner. When in central position another set of balls 5 will drop into perforations 4 and the bars may again be immediately shifted to drop the balls into the storage tubes for a succeeding code combination. Passages 11 are so arranged that the balls for succeeding combinations will remain in properly separated order to avoid mixing of the signals and so none of the balls can get out of proper order.

As cylinder 13 rotates the balls for each combination will be preceded by a ball picked up by pocket 14 carried around through guide 25 to actuate lug 24 and send a start or correcting impulse to the line. The balls in tubes 10 will be picked up sucessively by pockets 15 or 16 depending on their position in tubes 10. The balls in pockets 15 will be carried through guides 21 without affecting lugs 20, but the balls in pockets 16 will pass in the marking channels of guides 21 and will actuate lugs 20 to send marking impulses to the line. After the balls have been carried past the universal bar 18 they will drop into passage 9 and roll from 9 into tube 8. A feed screw 30 rotates continuously to force balls 5 up through tube 8 into chamber 7.

It will be obvious that the storage capacity of the transmitter depends upon the number and size of balls 5, and the length of tubes 10, and these may be varied to suit particular demands. It will also be apparent that many changes may be made in the preferred embodiments disclosed by persons skilled in the art without departing from the spirit of the invention, and the invention is therefore to be limited only by the terms of the following claims.

Having described preferred embodiments of the invention what is desired to be secured by Letters Patent and claimed as new is;

1. A storage transmitter comprising a plurality of contact controlling members; permutation means for arranging said members in various permutations; storage means for storing said permutations of members in fixed order, a single transmitting contact successively controlled by said stored permutation members to transmit code combinations of electrical impulses, and means for feeding said members to said permutation means indiscriminately and out of order.

2. A transmitter for sending selective permutations of impulses comprising a plurality of contact controlling members; a plurality of plural paths in which said members are adapted to move; permutation means for positioning said members to move in said paths in accordance with the signal to be transmitted; and a single contact operated at timed intervals by a plurality of said members, in accordance with their positions, to send part of said selective impulses.

3. The combination as set forth in claim 2, in which said single contact is operated at timed intervals by said permutations of members to send all of said selective impulses.

4. The combination as set forth in claim 2 and means for preceding each permutation of selective impulses with an invariable impulse.

5. The combination as set forth in claim 2, and a single path in which a contact controlling member is positioned to move to precede each selective permutation by an invariable impulse.

6. In a transmitter for sending code combinations of electrical conditions; transmitting contact operating means; a plurality of contact controlling members positioned in code combinations simultaneously, each combination being advanced abreast towards said operating means; and means for carrying the elements of said combination in successive order past said operating means.

7. The combination as set forth in claim 6 in which said operating means controls a single transmitting contact.

8. A transmitter comprising control means for positioning a plurality of balls in accordance with code combinations of impulses to be transmitted; means for feeding balls to said control means of gravity; means for storing said positioned balls; means for advancing successive combinations of said stored balls past impulse transmitting means; and independent rotary means for forcing said balls upward into said gravity feeding means.

9. The combination as set forth in claim 8 in which said last mentioned means comprises a continuously rotating screw.

Signed at Long Island City, N. Y., this 7th day of July, 1923.

EDWARD E. KLEINSCHMIDT.