W. H. SHEPHARD & A. E. McKECHNIE.

TELEGRAPH SYSTEM.

APPLICATION FILED MAR. 4, 1915.

1,156,043.

Patented Oct. 5, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

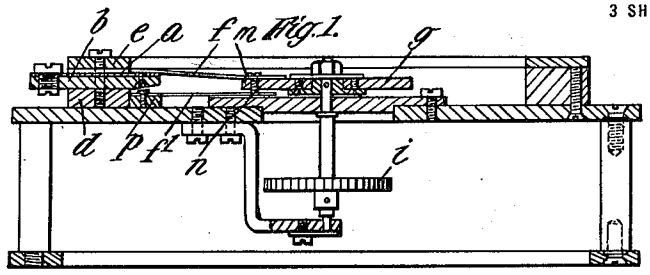


Fig. 2.

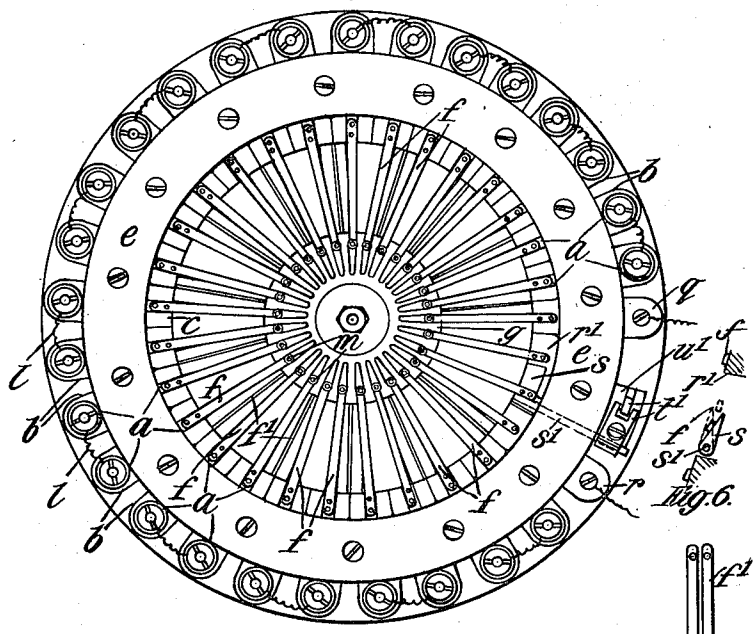


Fig. 6.

Fig. 7.

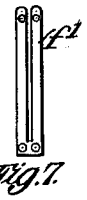


Fig. 9.

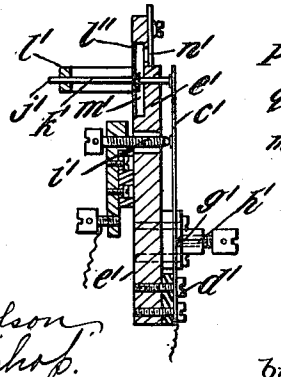
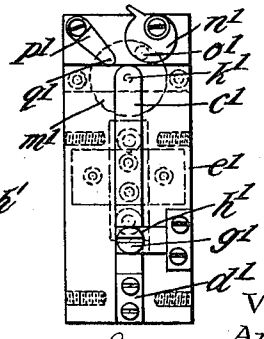


Fig. 8.



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3 SHEETS—SHEET 2.

Fig. 3.

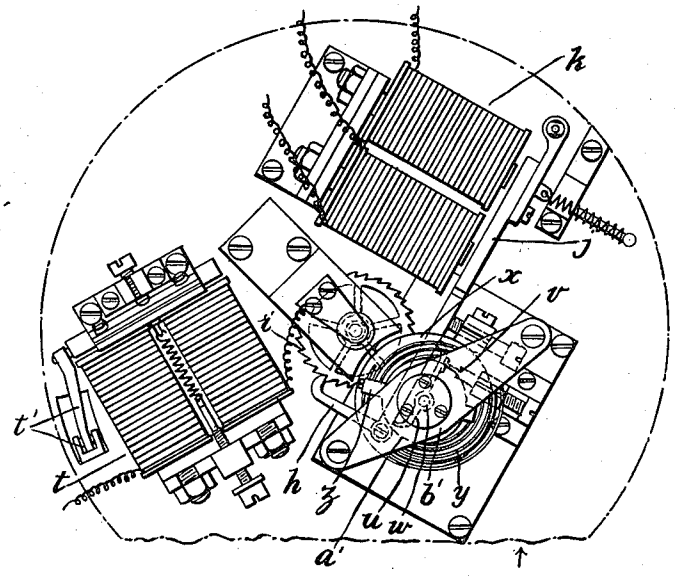


Fig. 4.

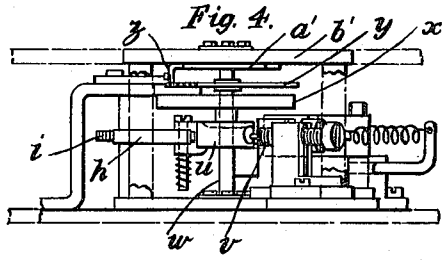
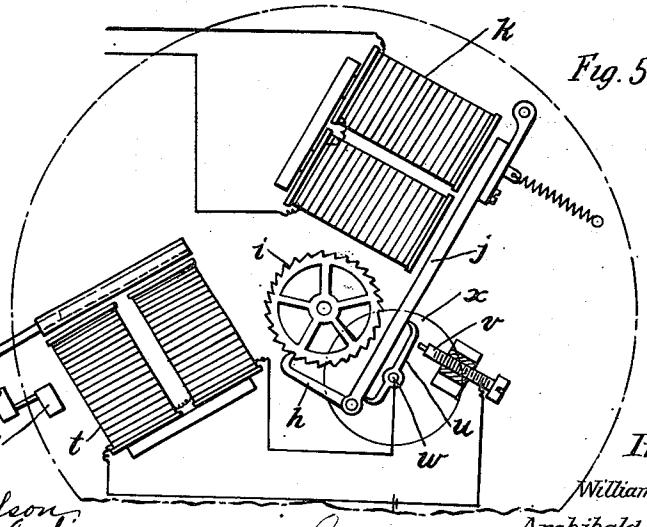


Fig. 5



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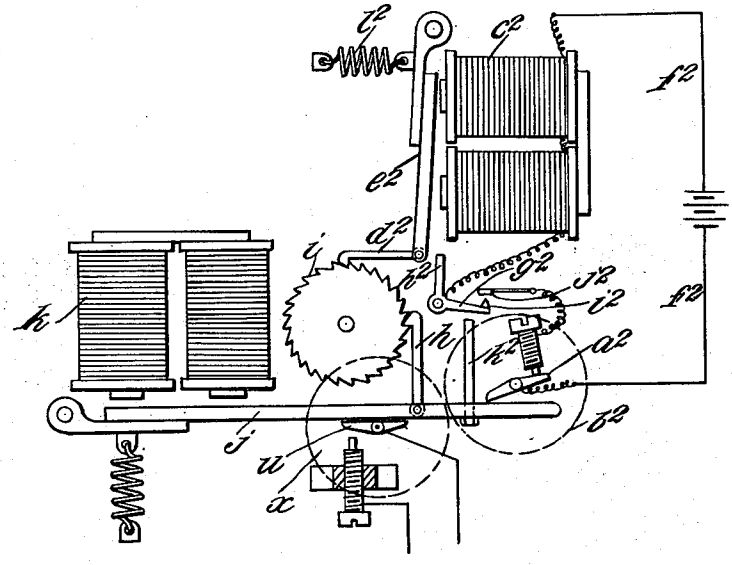
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3 SHEETS—SHEET 3.

Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM HENRY SHEPHARD AND ARCHIBALD EDWARD McKECHNIE, OF BAYSWATER, LONDON, ENGLAND.

TELEGRAPH SYSTEM.

1,156,043. Specification of Letters Patent. Patented Oct. 5, 1915.

Application filed March 4, 1915. Serial No. 12,232.

To all whom it may concern:

Be it known that we, WILLIAM HENRY SHEPHARD and ARCHIBALD EDWARD McKECHNIE, both subjects of the King of Great Britain, residing, respectively, at 3 Crown Court, Old Broad street, and 5 Colville Terrace, Bayswater, both in the county of London, England, have invented certain new and useful Improvements in Telegraph Systems, of which the following is a specification.

This invention relates to line or wireless telegraph systems and has for its chief object to provide a selector which will become operative to work an alarm device or perform any other desired operation only when a predetermined signal is received.

In order that the said invention may be clearly understood and readily carried into effect we will now proceed to describe the same more fully with reference to the accompanying drawings in which:—

Figure 1 is a vertical section of selecting apparatus embodying the invention, the surrounding casing being omitted for the sake of clearness. Figs. 2 and 3 are top and bottom plan views thereof respectively. Fig. 4 is a side elevation of a portion of the selecting apparatus looking in the direction of the arrow shown in Fig. 3. Fig. 5 is a diagram showing the electro-magnets and relative electrical connections and associated parts. Fig. 6 is a detail of a deflector hereinafter referred to. Fig. 7 is a detail of one of the inner fixed brushes of the apparatus. Fig. 8 is an end elevation and Fig. 9 is a vertical section taken at right angles thereto of an alternative form of electric switch for controlling the aforesaid deflector. Fig. 10 is a diagram showing a modified arrangement of the electro-magnets and relative parts.

Referring first more particularly to Figs. 1 and 2, the contact points *a* in the example shown are arranged on one face of each of a number of members *b* made of any suitable insulating material and constituting a ring *c*, each of said members being capable of being inverted and adapted to be held stationary within corresponding grooves in a metallic ring *d* by means of an annular cover plate *e* and screws. The contact points *a* are therefore capable of being arranged on both faces of the ring thus constituted, the points on one face, *e. g.* the lower face, representing the dots of the Morse code, and the points on the other face the dashes. When the distress signal (S. O. S.) is the message that is to render say an alarm device operative, the points would be arranged in succession as follows:—Three on one face of the ring to represent the three dots of the letter S, three on the other face to represent the three dashes of the letter O, and then three on the first mentioned face to again represent the letter S. In order to prevent the alarm device becoming operative when a word containing S. O. S. is received we may if desired arrange the apparatus to work with the letters S. O. S. S. or S. O. S. S. O. or the like, the distress signal or other call always being repeated several times by the transmitting station.

The brushes *f* are carried by an insulated disk *g* which rotates step by step when the receiving circuit becomes operative, preferably by means of a pawl *h* and ratchet wheel *i*, the former being actuated by the armature *j* of an electromagnet *k* arranged within said circuit. The contact points *a* and brushes *f* may be permanently and momentarily coupled electrically in pairs respectively, so that it is necessary for each point to be in contact with a brush before the circuit through the points and the alarm device is completed.

As shown in Fig. 2, the contact points are electrically coupled, as at *l*, in pairs and a brush *f* is adapted to engage with each contact point *a*, the brushes *f* being connected at their inner ends to the insulated disk *g* by means of screws *m* the inner ends *n* of which are adapted to engage with the limbs of fork-like brushes *f'* (Figs. 1, 2 and 7) secured at their outer ends to a fixed ring *p* of insulating material. The terminals *q*, *r* are arranged within a circuit including the alarm device not shown.

In order that the brushes *f* may be deflected to one side or other of the ring when a message is being received we provide a deflector *s* (Figs. 2, 5 and 6) which moves the brushes in one direction when a dot is received and in the reverse direction when a dash is received. Each of the brushes *f* is thus held on one side or the other of the ring carrying the contact points *a*, and it is only when the particular message is received to which the contact points are set that the circuit is completed to operate the alarm device.

In order that the deflector shall operate differently for dots and for dashes as afore-

said, we provide means whereby if the receiving circuit is operative for more than say a tenth of a second the deflector will be moved from its normal position into one which will move the brush contiguous thereto to the side of the ring carrying the contact points representing the dashes. For this purpose the deflector s may be under the control of an electromagnet t the circuit through which is controlled by a switch. This switch is connected through a delayed action or inertia contrivance with the armature of the electromagnet k or solenoid arranged in the receiving circuit.

As shown more particularly in Figs. 3 and 4, the said switch comprises a double-armed element u adapted to engage at one end with an adjustable contact screw v and to be disengaged therefrom by the armature of the electromagnet k. The element u is secured to a spindle w on which is frictionally and rotatably mounted a rotatable disk x serving as a balance wheel when driven by said spindle, which is rotated through the medium of a spiral spring y one end of which is attached to the spindle and the other end of which is attached to a lug z on a second disk a' which is angularly adjustable relatively to a fixed carrier b' and adapted to be secured thereto after the manner of a watch regulator. Alternatively, as shown in Figs. 8 and 9, the switch may comprise a blade spring c' secured at d' to a bracket e', the pressure exerted by which spring on the end of a spindle j' hereinafter referred to may be regulated by an adjusting screw g' threaded into and passing through a bearing h' on said bracket. The said spring c' is adapted to be moved relatively to an adjusting electrical contact screw i' through the medium of the armature of the aforesaid electromagnet k acting at j' on the end of a spindle k' one end of which passes through a fixed bearing l' and the other end of which passes through the bracket e' and engages the blade spring c'. Secured to the spindle k' so as to be capable of moving axially therewith is a thin disk l'', which disk is fitted within a chamber m' formed in the bracket e' so as to constitute a kind of dash pot. The admission of air is regulated by a pivoted shutter n' movable relatively to an opening o' leading to the chamber m', while the exit of the air is permitted by means of a non return flap valve p' which is capable of being moved outwardly by the air pressure created within the chamber m' by the disk l'' so as to uncover a similar opening beneath flap valve p' and leading from said chamber. By the means just described if the electromagnet k is operative for more than the predetermined length of time the switch is actuated and the deflector s is shifted to the desired position as aforesaid, said deflector being secured, for instance, to a spindle s' operable by interconnected levers t' from the pivot pin of the armature of the electromagnet t, an opening being formed at u' to permit the levers to be operated. The ring may be formed with a gap r' (Figs. 2 and 6) to enable the brushes f to resume their normal position before they again come into contact with the deflector, as indicated in Fig. 6.

It will be understood that the disposition and arrangement of the armature of the electromagnet k in relation to the said switch is such that the latter is not opened by the movement of the armature until the brush passing into the gap r' has been brought over or under the deflector s. For this purpose, when the said switch is closed, a predetermined amount of clearance is afforded between the armature j and that end of the element u which does not engage with the contact screw v.

Means may also be provided whereby the relatively long spaces between each of the characters representing the letters or words of the code are differentiated from the short spaces between the dots and dashes constituting the characters of the code. For this purpose there may be employed as shown in Fig. 10, an electric switch a^2 which is adapted to be controlled by a delayed action or inertia contrivance b^2 similar to the disk x, already described and is capable of being actuated by the armature j of the electromagnet k whenever a dot or dash is received.

In circuit with the switch a^2 is an electromagnet c^2 which serves each time it is energized to rotate the ratchet wheel i to the extent of one tooth by means of a pawl d^2 associated with the armature e^2 of the electromagnet c^2. When the pawl d^2 has rotated the ratchet wheel i to the desired extent, the circuit f^2 containing the electro-magnet c^2 is broken and the latter is deënergized. This may be effected by providing in the circuit f^2 a switch g^2 which may include an arm h^2 with which the lower end of the armature e^2 engages when said armature is attracted, thereby causing a contact i^2 on the switch to be disengaged from a relatively fixed contact j^2. When the armature j is attracted, the switch a^2 is opened and the switch g^2 is closed through the medium, for instance, of a projection k^2 on the armature j.

Should the armature j remain sufficiently long at rest when its corresponding electromagnet k is deënergized (*i. e.* should the length of time correspond to a space between the letters of a message that is being received) the delayed action or inertia contrivance b^2 will close the switch a^2, thereby causing the electro-magnet c^2 to be energized and consequently cause the armature

e^2 to be attracted against the action of a spring l^2, whereupon the ratchet wheel i is rotated to the extent of one tooth by means of the pawl d^2. If, however, the period during which the armature j remains at rest is so short (corresponding to the space between the dots and dashes of a letter) that the delayed action or inertia contrivance b^2 is not permitted to effect the closing of the switch a^2, no movement of the ratchet wheel i and consequently of the brushes f (Figs. 1 and 2) will take place between the successive movements of the ratchet wheel under the influence of the pawl h. In setting the aforesaid contact points to represent a predetermined code signal, the relatively long spaces between the characters representing the letters or words of the code may be provided for by leaving between electrically connected adjoining contact points sections of suitable width which are not electrically connected.

What we claim and desire to secure by Letters Patent of the United States is:—

1. In a telegraph system, receiving apparatus comprising a number of contact points capable of being arranged in accordance with a predetermined signal, a number of brushes movable relatively to the contact points, a member adapted to cause the brushes to be deflected to one side or other of the contact points, and electrically controlled devices including a delayed action contrivance for actuating said member, said devices being rendered operative when the predetermined signal is received.

2. In a telegraph system, receiving apparatus comprising a number of contact points capable of being arranged in accordance with a predetermined signal, a number of brushes movable relatively to the contact points, a member adapted to cause the brushes to be deflected to one side or other of the contact points, and electrically controlled devices including a delayed action contrivance for actuating said member, said devices being rendered operative when the predetermined signal is received and said delayed action contrivance being so arranged relatively to the said electrically controlled devices as to insure that a brush moving toward and contiguous to the deflecting member will be brought into position at one side or other of the deflecting member before the latter is actuated.

3. In a telegraph system, receiving apparatus comprising a ring, a number of contact points carried by said ring, said contact points being capable of being arranged in accordance with a predetermined signal, a number of brushes movable relatively to the contact points, a member adapted to cause the brushes to be deflected to one side or other of the contact points, and electrically controlled devices including a delayed action contrivance for actuating said member, said devices being rendered operative when the predetermined signal is received.

4. In a telegraph system, receiving apparatus comprising a ring having a gap, a number of contact points carried by said ring, said contact points being capable of being arranged in accordance with a predetermined signal, a number of brushes movable relatively to the contact points, a member arranged within said gap adapted to cause the brushes to be deflected to one side or other of the contact points, and electrically controlled devices including a delayed action contrivance for actuating said member, said devices being rendered operative when the predetermined signal is received and said delayed action contrivance being so arranged relatively to the said electrically operated devices as to insure that a brush entering said gap will be brought into position at one side or other of the deflecting member before the latter is actuated.

5. In a telegraph system, receiving apparatus comprising a number of contact points capable of being arranged in accordance with a predetermined signal, a number of brushes movable relatively to the contact points, and means comprising a delayed action contrivance for controlling the movement of the brushes whereby the relatively long spaces between the characters of the code are differentiated from the short spaces between the dots and dashes constituting the said characters.

6. In a telegraph system, receiving apparatus comprising a number of contact points capable of being arranged in accordance with a predetermined signal, a number of brushes movable relatively to the contact points, and means for controlling the movement of the brushes, said means comprising a plurality of electric switches, a delayed action contrivance associated with one of said switches, an electrically operated device adapted to rotate the brushes and a second electrically operated device adapted to rotate the brushes, the last mentioned device being capable of controlling the other electrically operated device through the medium of the said switches.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM HENRY SHEPHARD.
ARCHIBALD EDWARD McKECHNIE.

Witnesses:
W. H. MURLY,
WALTER J. SKERTEN.