

May 22, 1928.

1,670,986

J. RIDDLE

TELEGRAPH TRANSMITTER

Filed May 7, 1927

2 Sheets-Sheet 1

Fig. 1.

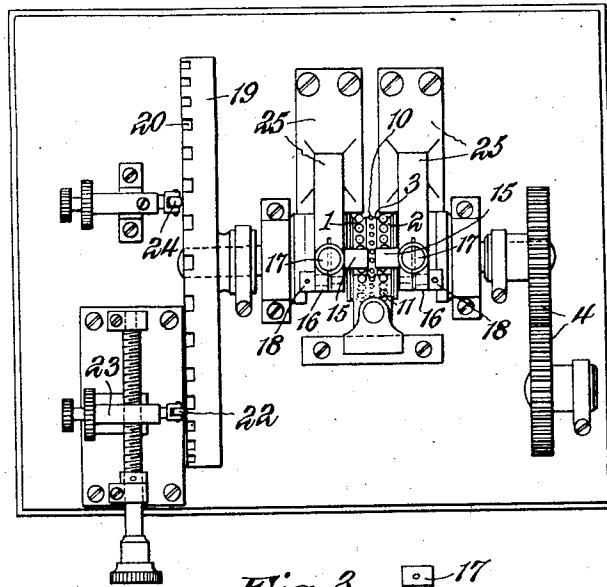


Fig. 3.

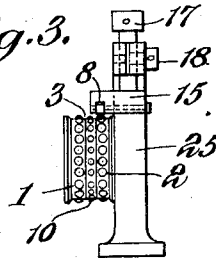


Fig. 2.

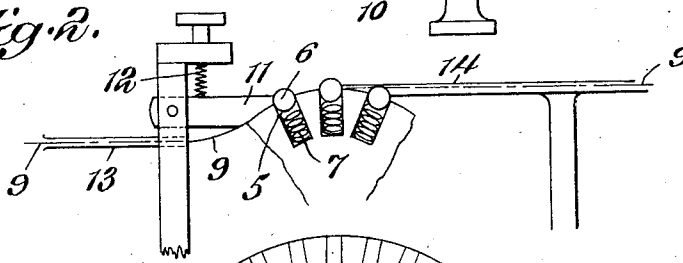
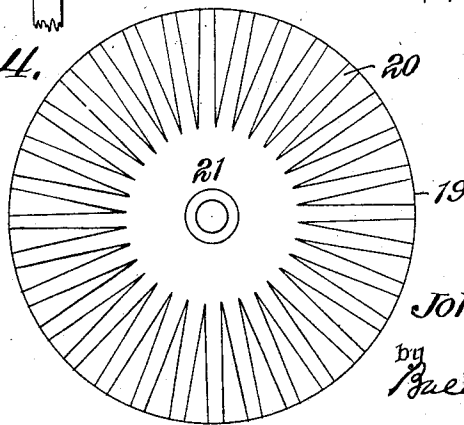


Fig. 4.



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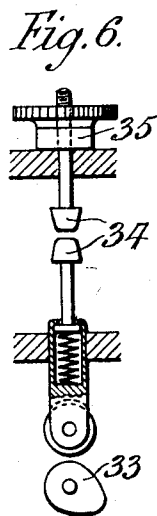
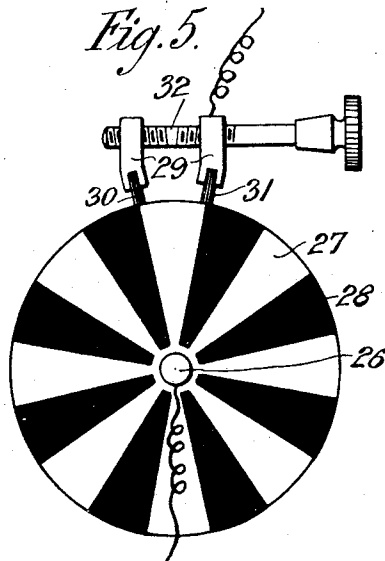
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2 Sheets-Sheet 2



INVENTOR,

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By His Attorneys

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UNITED STATES PATENT OFFICE.

JOHN RIDDLE, OF LONDON, ENGLAND, ASSIGNOR TO TELEGRAPH CONSTRUCTION
AND MAINTENANCE COMPANY, LIMITED, OF LONDON, ENGLAND.

TELEGRAPH TRANSMITTER.

Application filed May 7, 1927, Serial No. 189,662, and in Great Britain June 25, 1926.

This invention relates to improvements in or relating to telegraph transmitters.

Transmitting apparatus constructed according to the present invention comprises
5 a rotatable disk, a plurality of outwardly biased plungers of conducting material, located in recesses in the disk, and a conducting surface, such as a roller formed of or
faced with conducting material and located
10 in close proximity to the path or paths of the said plungers, the arrangement being such that when a signal strip is passed between the roller and disk, contact is made
between a plunger and the roller at such
15 places as the strip is punched.

When the invention is applied to transmitting apparatus for transmitting signals, adapted to be actuated by a standard
punched strip for reverse current signalling,
20 the apparatus preferably comprises a pair of disks and rollers, made as described above, and insulated from one another. This may conveniently be effected by means
of a third disk formed of insulating material and provided with pins or spurs adapted
25 to engage the central holes in the strip.

In one form of construction the apparatus consists of two metal disks which are insulated from each other by a third disk
30 of vulcanite or other insulating substance. These disks are rotated as one. Each of the metal disks is provided at its periphery with a ring of radial recesses in which are located balls of suitable metal which project through
35 the signal holes in the punched strip wherever they occur. The diameter at the outer ends of the recesses is made less than that of the balls, so that these latter are retained in the recesses.

40 Located in each recess is a spring which normally presses the ball outwards so that this latter normally projects beyond the periphery of the disk.

Two rollers are held in position above
45 each ring of balls, and means are provided by which their position can be accurately adjusted.

When the paper is run through the apparatus by means of the spurs on the insulating disk, contact is made between the
50 rollers and the balls at such places as the strip is punched.

We have found that with an instrument

constructed as above described, it is possible to send distinct signals at a high rate of
55 speed, for the reason that after any given ball has been depressed, a comparatively long period of time, that is to say, substantially the time taken by one complete revolution of the disk, elapses before the ball is
60 acted upon again.

Preferably we provide means by which the time of contact and earthing can be controlled. Such means may consist of a
switch device inserted in effective series in a
65 line and adapted to limit the duration of a contact period downward from a maximum of full contact, i. e. from a maximum when the switch device never breaks circuit. Such control of the contact and earthing
70 periods can be effected in various different ways. In one arrangement there is employed for this purpose a disk of insulating material in which radial arms of metal are embedded and converge to a common hub.
75 A brush of any suitable material or form is held in a traveller so that it can be brought towards the middle of the said disk, in which position it makes continuous contact with the metal arms. When it is brought to
80 the greatest diameter of the disk, the marking current may be 40% or less.

The invention is illustrated in the accompanying drawing, of which Figure 1 is a plan view of a transmitter in accordance
85 with the invention, Figures 2, 3 and 4 are detail views and Figures 5 and 6 are detailed views of two modifications.

Referring to the Figures, 1 and 2 are two metal disks which are insulated from each
90 other by a third disk 3 of vulcanite or other insulating substance. These disks are rotated as one drum by means of gear wheels 4, and will hereinafter be referred to as the drum. Each of the metal disks is provided
95 at its periphery with a ring of radial recesses 5 (see Figure 2) in which are located balls 6 of suitable metal. The diameter at the outer ends of the recesses is made less
100 than that of the balls so that these latter are retained in the recesses. Located in each recess is a spring 7 which normally presses the ball outwards so that this latter normally projects beyond the periphery of the disk.

Two rollers 8 are held in position above

each ring of balls, and means, to be described hereinafter, are provided by which their position can be accurately adjusted.

9 is the signal punched paper which is run through the apparatus by means of the spurs 10 on the insulating disk, and it will be seen that contact will be made between the rollers and the balls at such places as the strip is punched.

The punched strip 9 is held in position by a guide 11 (Figure 2) which is of substantially the same radius as the drum, and is cut out to clear the balls and spurs. Tension is applied by means of a spring 12 which is adjustable.

The strip is carried to the drum by way of a flattened tube 13, the end of which leads the strip to the periphery of the drum when it engages with the spurs 10. It is then carried away through a like tube 14, which is flush with the drum on the opposite side.

The rollers 8, which are preferably grooved to the radius of the balls, as shown in Figure 3, are held in position by brackets 25 (Figures 1 and 3) which have two parallel arms 15, 16, one above the other. The lower arm 15 is flexible to a certain extent, and carries the roller, while the upper arm 16 is as rigid as possible, and carries a set screw 17 which, when screwed down, presses the arm carrying the roller closer to the drum. A transverse screw 18 is provided and serves as a locking device.

The apparatus illustrated in the figures comprises means by which the time of contact and earthing can be controlled. These said means comprise a disk 19 (Figure 4) of insulating material, in which radial arms 20 of metal are embedded, the said arms converging to a common hub 21.

22 is a carbon or other suitable brush carried in a traveller 23, whereby it may be traversed across the disk from a position in which it makes continuous contact with the metal arms or with the hub (giving 100% marking or block signals) substantially to the edge of the disk. A second brush 24, rubbing continuously on the hub, is employed to complete the circuit. When the brush 22 is brought to bear at the greatest diameter of the disk, the marking current may be 40% or less.

In a modification illustrated schematically in Figure 5, the means for controlling the time of contact and earthing comprise a timing disk formed as an ordinary commutator 26, with the conductor bars 27 arranged round the periphery and a suitable width of insulation 28 between each bar. A horse-shoe-shaped brush 29 bears on the disk, the brush having two contacts 30, 31, which spring from a common conducting base. Means, such as a right and left handed screw 32 are provided for bringing the two brush

contacts together, in which position there is minimum time contact. The said contacts are arranged to be separable until they bridge one conductor bar with the next; in this position there is 100% marking.

The transmitter can be used in conjunction with any standard pattern relay.

In a further modification illustrated schematically in Figure 6, the time of contact and earthing is governed by a cam 33 which rotates once for each centre hole and thereby brings together a pair of contacts 34, the period of contact being adjustable by means of the screwed nut 35. The operation of this device will be obvious from the figure.

I claim:—

1. Telegraph transmitting apparatus comprising in combination a disk shaped contact device, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, and means for rotating said disk shaped contact device.

2. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, and means for rotating said pair of contact disks.

3. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, signal tape driving means associated with said contact disks, and means for rotating said pair of contact disks and said signal tape driving means.

4. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, an insulating disk having spurs thereon and located between the pair of contact disks, and means for rotating said pair of contact disks and said insulating disk.

5. Telegraph transmitting apparatus comprising in combination a disk shaped contact device, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, conductive roller means for effecting electrical connection co-operating with said plungers, an electrical circuit including

said conductive plungers and said conductive roller means, and means for rotating said disk shaped contact device.

6. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, conductive roller means for effecting electrical connection co-operating with said plungers, an electrical circuit including said conductive plungers and said conductive roller means, an insulating disk having spurs thereon and located between the pair of contact disks, and means for rotating said pair of contact disks and said insulating disk.

7. Telegraph transmitting apparatus comprising in combination a disk shaped contact device, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, electrical connection means co-operating with said balls, an electrical circuit including said conductive balls and said electrical connection means, and means for rotating said disk shaped contact device.

8. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, electrical connection means co-operating with said balls, an electrical circuit including said conductive balls and said electrical connection means, and means for rotating said pair of contact disks.

9. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, electrical connection means co-operating with said balls, an electrical circuit including said conductive balls and said electrical connection means, an insulating disk having spurs thereon and located between the pair of contact disks, and means for rotating said pair of contact disks and said insulating disk.

10. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, conductive roller means for effecting electrical connection co-operating with said balls, an electrical circuit including said conductive balls and said conductive roller means, an insulating disk having spurs thereon and located between the pair of contact disks, and means for rotating said pair of contact disks and said insulating disk.

11. Telegraph transmitting apparatus comprising in combination a disk shaped contact device, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, adjustable electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said adjustable electrical con-

nection means, and means for rotating said disk shaped contact device.

12. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, adjustable electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said adjustable electrical connection means, an insulating disk having spurs thereon and located between the pair of contact disks, and means for rotating said pair of contact disks and said insulating disk.

13. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, conductive roller means for effecting adjustable electrical connection co-operating with said balls, an electrical circuit including said conductive balls and said conductive roller means, an insulating disk having spurs thereon and located between the pair of contact disks, and means for rotating said pair of contact disks and said insulating disk.

14. Telegraph transmitting apparatus comprising in combination a disk shaped contact device, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, means for controlling the relative times of contact and earthing, and means for rotating said disk shaped contact device.

15. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, an insulating disk having spurs thereon and located between the pair of contact disks, means for controlling the relative times of contact and earthing, and means for rotating said pair of contact disks and said insulating disk.

16. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, conductive roller means for effecting electrical connection co-operating with said balls, an electrical circuit including said conductive balls and said conductive roller means, an insulating disk having spurs thereon and located between the pair of contact disks, means for controlling the relative times of contact and earthing, and means for rotating said pair of contact disks and said insulating disk.

17. Telegraph transmitting apparatus comprising in combination a disk shaped contact device, a plurality of recesses therein, outwardly biased conductive plungers in said
5 recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, means comprising a rotatable insulating disk provided with
10 a plurality of radial conductive arms co-operating with adjustably positioned brushes bearing upon the face of said insulating disk, for controlling the relative times of contact and earthing, and means for rotating said
15 disk shaped contact device.

18. Telegraph transmitting apparatus comprising in combination a pair of contact disks, a plurality of recesses therein, outwardly biased conductive plungers in said
20 recesses, electrical connection means co-operating with said plungers, an electrical circuit including said conductive plungers and said electrical connection means, an insulating disk having spurs thereon and located between the pair of contact disks, means comprising a rotatable insulating disk provided with a plurality of radial conductive arms co-operating with adjustably positioned

brushes bearing upon the face of said insulating disk, for controlling the relative times
30 of contact and earthing, and means for rotating said pair of contact disks and said insulating disks.

19. Telegraph transmitting apparatus comprising in combination a pair of contact
35 disks, a plurality of recesses therein, outwardly spring biased conductive balls in said recesses, conductive roller means for effecting electrical connection co-operating with said balls, an electrical circuit including
40 said conductive balls and said conductive roller means, an insulating disk having spurs thereon and located between the pair of contact disks, means comprising a rotatable insulating disk provided with a plurality of
45 radial conductive arms co-operating with adjustably positioned brushes bearing upon the face of said insulating disk, for controlling the relative times of contact and earthing, and means for rotating said pair of contact
50 disks and said insulating disk.

In testimony that I claim the foregoing as my invention I have signed my name this 21st day of April, 1927.

JOHN RIDDLE.