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ARRANGEMENT FOR THE TELEGRAPHIC TRANSMISSION OF PICTURES AND THE LIKE

Filed May 6, 1930

Fig. 1

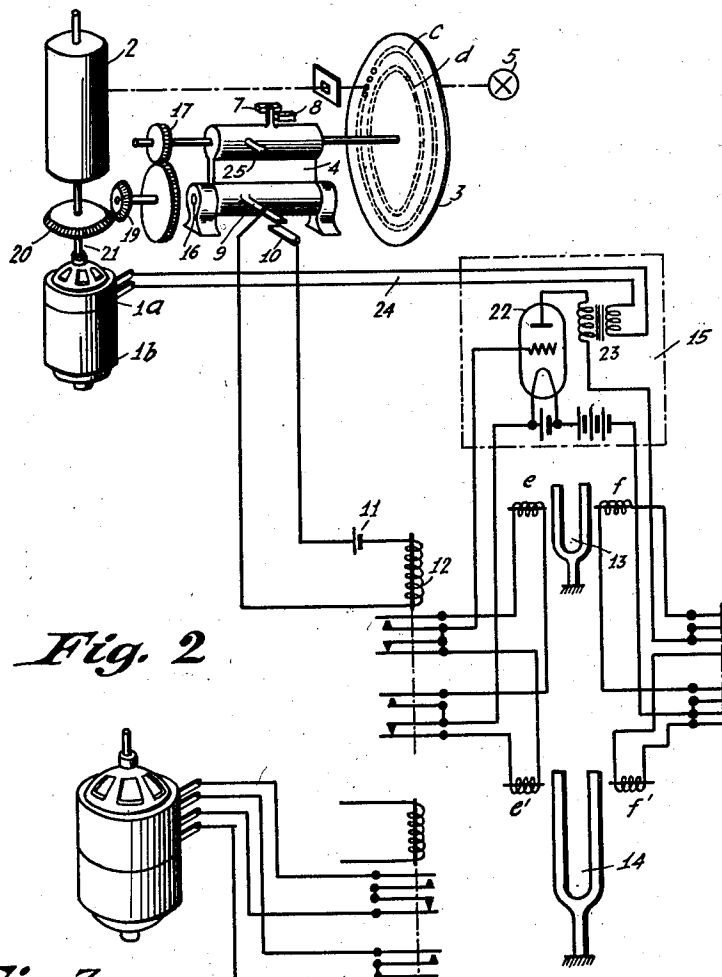
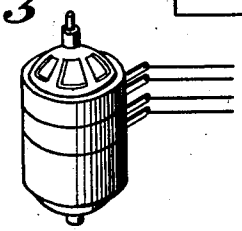



Fig. 2



Fig. 3



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# UNITED STATES PATENT OFFICE

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## ARRANGEMENT FOR THE TELEGRAPHIC TRANSMISSION OF PICTURES AND THE LIKE

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In the telegraphic transmission of pictures and the like it is often necessary to use a coarse or a fine analysis, according to the type and manner of application of the picture. The changes in the connections, resulting therefrom, at the transmitter and receiver are particularly complicated and time-consuming in those apparatus in which a revolving perforated disk, disposed in the path of the rays, is positively connected with the picture cylinder. This difficulty arises because of the fact that in such an arrangement the driving gears must be exchanged and the perforated disk must be replaced by one with a different number of perforations in order to establish again, because of the change in the record carrier or cylinder, the most favorable transmitting frequency. The exchange of the gears could be avoided in evident manner by means of a feed mechanism but there would result, due to the varying engagement of the toothed wheels, troublesome sources of errors in the transmission.

According to the present invention, a switching arrangement is provided whereby, for the purpose of changing the size of the record carrier, the number of revolutions of the motor driving the picture cylinder may be varied while maintaining, at least in approximate manner, the optimum frequency of perforation. All time-consuming exchange is thereby avoided and the step from one record carrier size to the other is effected by means of a single manipulation.

For the purposes of the invention, the perforated disk is provided with two or several concentric rows of holes and is arranged in pivoting manner so that, according to choice, one of the various circles of holes may be brought in the path of the rays. The frequency of transmission, thereby changed, the dependency of the product of the number of perforations by the rotational speed, must now again be adapted, to say the least, for the purpose of maintaining the optimum frequency given by the transmission channel, to this frequency and at the same time the number of revolutions of the picture cylinder must also be changed for the purpose of changing the size of the analyzer. Hence, there is actuated by the changing of the perforated disk a switching relay which, with the simultaneous change of the synchronizing frequency for picture cylinder and perforated disk, accelerates or retards the common transmission motor with respect to its number of revolutions. If there are used for the synchronization arrangements controlled by diapasons, there may be switched in by the switching device one of several existing diapason devices which influence the tone wheel of the driving motor.

Another alternative consists, when one tuning fork is used, hence one frequency, and with the use of a tone wheel, whose poles may be switched, or of two or several tone wheels of different pole number, in switching the tone wheel, whose poles may be switched, or in switching in the corresponding tone wheel. At the receiving end the switching may be accomplished mechanically by hand due to the absence of the perforated disk. Of course, there is nothing to prevent to accomplish the switching likewise electromagnetically by means of a key actuated by hand.

These features have been illustrated by the accompanying drawings, wherein:

Figs. 1 to 3 show, by way of example, embodiments of the invention in schematic manner.

Referring now to the drawings, the perforated disk 3, arranged in the path of the rays of a projection lamp 5 is disposed in the pivot bearing 4 so that it may pivot around axle 16 and is driven through the intermediary of toothed wheels 17, 18, 19, 20 by the driving motor 1*b* with tone wheel 1*a*. The picture cylinder 2 is likewise disposed on the shaft 21 of the motor. The perforated disk is provided for instance with two rows of holes *c* and *d*, each having different numbers of perforations. Due to the pivoting arrangement of the perforated disk 3, either of the sets of holes *c* or *d* may be brought, according to need, in the path of the rays from lamp 5. The limiting positions of the pivot bearing are indicated by stops 7 and 8.

At the pivot bearing 4 is provided an arm 9 which actuates a contact 10. The contact

10 is connected in the circuit of relay 12 and battery 11. With the energizing of the relay 12, the diapason-synchronizing device 13, 14, 15 is switched in such manner that either the tuning fork 13 or the tuning fork 14 influences in frequency-determining manner the oscillating tube 22. The tuning forks 13 and 14 respectively, are connected as coupling elements between the grid coils *e*, *e'*, respectively, and the plate current coil *f*, *f'*, respectively. The synchronizing frequency is taken off from the joint part of the plate circuit by means of transformer 23 and conveyed over line 24 to the tone wheel 1*a* for the regulation.

The mode of operation of the arrangement is as follows:

In the position of the perforated disk as shown, the circle of perforations *c* is made use of, i. e., the smallest analyzer is employed. If there is now to be used a larger or coarser analyzer, the pivot bearing is shifted by means of lever 25 whereby, without any change in the engagement of the driving gears, the circle of perforations *d* is switched in the path of the rays. The decrease in the perforation frequency, caused thereby, is now equalized again in the manner that by means of the switching over of the relay 12 through switch 10 the tuning fork 13 with a corresponding higher frequency is switched in. Consequently, the tone wheel is imparted a higher synchronizing frequency with the result that the motor 1*b* runs faster. Thereby the perforated disk as well as the picture cylinder is given a faster rotation. The increase in the number of revolutions of the perforated disk equalizes the perforation frequency, decreased due to the switching in of the perforation circle *d*, and the increase in the number of revolutions of the picture cylinder results in a coarser analyzer.

Figs. 2 and 3 explain in evident manner the arrangement when use is made of a tone wheel whose poles may be switched. According to Fig. 2, the switching action may be accomplished by the relay 12 in such manner that with a smaller number of switched in poles, with the same frequency, a higher number of revolutions will occur, and with a larger number of switched in poles a smaller number of revolutions will occur. Instead of a multiple tone wheel, there may also be provided several tone wheels of different pole number, according to Fig. 3, on a common shaft, of which only one is in operation at a certain time while the others idle.

At the receiving end the positive switching connection with the perforated disk may be dispensed with since the latter does not exist, and an arrangement will suffice for the change in the number of revolutions of the picture cylinder, respectively the synchronizing arrangement. Hence, the switch 10 may be developed at the receiving end as key to be manipulated by hand.

Having now described our invention, what we claim and desire to secure by Letters Patent is the following:

1. An arrangement for telegraphic transmission of pictures which includes a rotary picture carrying drum and means for driving the same, a rotary perforated disk for producing a chopper frequency in the light used for exploring the picture carried by the said drum, means for driving said disk from the drive motor for said picture carrying drum, and a switching device operable with changes in the size of the picture carrying drum for producing a change in the speed of the motor drive for maintaining optimum chopper frequency from said chopper disk for all sizes of picture carrying drums.

2. An arrangement for telegraphic transmission of pictures which includes a rotary picture carrying cylinder and a motor for driving the said cylinder, a rotary perforated disk for producing a chopper frequency in the light used for exploring the picture carried by the said cylinder, means for driving said disk from the drive motor for said picture carrying cylinder, and a speed controlling device operable with changes in the size of the picture carrying drum for producing a regulation of the speed of the motor drive for maintaining optimum chopper frequency from said chopper disk for all sizes of picture carrying drums.

3. In combination with an arrangement for the telegraphic transmission of pictures having a picture carrying drum driven from a variable speed source, a rotary light chopping disk having a plurality of concentric rows of perforations and adapted to be driven by said drive source for said drum, means for changing the effective row of perforations on said disk upon changes in the size of the picture carrying drum, and a switch operable with changes in the position of the effective row of perforations on said disk for controlling the speed of said source of power so as to maintain optimum chopper frequency for all sizes of picture carrying drums.

4. In combination with an arrangement for the telegraphic transmission of pictures having a picture carrying drum driven from a variable speed source, a rotary light chopping disk having a plurality of concentric rows of perforations and adapted to be driven by said drive source for said drum, means for changing the chopping action from one row of perforations on said disk to another upon changes in the size of the picture carrying drum, and a switch operable with changes in the position of the effective row of perforations on said disk for controlling the speed of said source of power so

as to maintain optimum chopper frequency for all sizes of picture carrying drums.

5. In combination with a picture transmission system having a rotary picture carrying drum and a motor for driving the same, a light chopping disk having a plurality of concentric rows of perforations about the periphery thereof for producing a chopper frequency in the light supplied for analyzing pictures carried upon said drum, means for shifting said perforated disk so as to expose the different rows of perforations to light chopping action upon changes in the size of the picture carrying drum, a synchronizer for providing different frequency supply energies to said drive motor, and a switch operable upon changes in the effective rows of perforations on said disk for changing the frequency of the drive energy supplied to said motor for producing different speed rotations therefrom for different size picture carrying drums so as to maintain optimum perforation frequencies at all times from said chopping disk.

6. In combination with a picture transmission system having a rotary picture carrying drum and a motor for driving the same, a light chopping disk having a plurality of concentric rows of perforations about the periphery thereof for producing a chopper frequency in the light supplied for analyzing pictures carried upon said drum, means for shifting said perforated disk so as to expose the different rows of perforations to light from the source upon changes in the size of the picture carrying drum, a source of synchronous energy for providing different frequency supply energies to said drive motor, and means operable upon shifts in the effective rows of perforations on said disk for changing the frequency of the drive energy supplied to said motor for producing a constant but different rotational speed therefrom for different size picture carrying drums so as to maintain optimum perforation frequency at all times from said chopping disk.

In testimony whereof we affix our signatures.

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