

E. C. PHILLIPS & T. RHODUS.
TELEGRAPH TRANSMITTER.

APPLICATION FILED FEB. 17, 1912. RENEWED NOV. 4, 1912.

1,064,373.

Patented June 10, 1913.

3 SHEETS—SHEET 1.

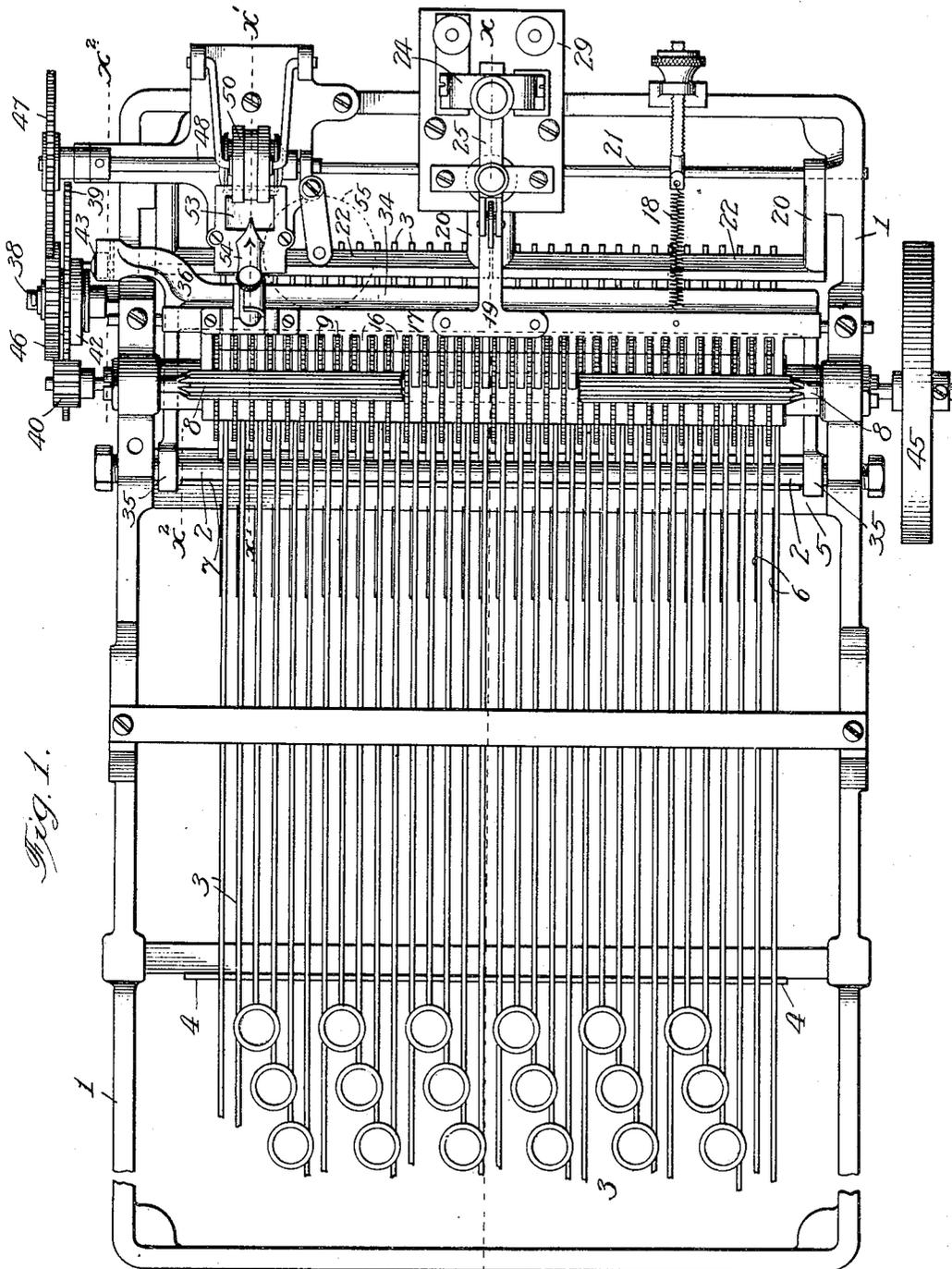


Fig. 1.

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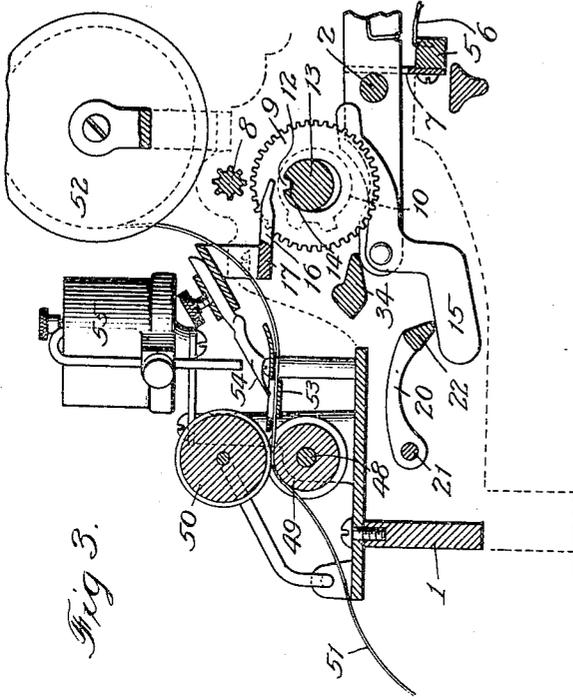


Fig. 3.

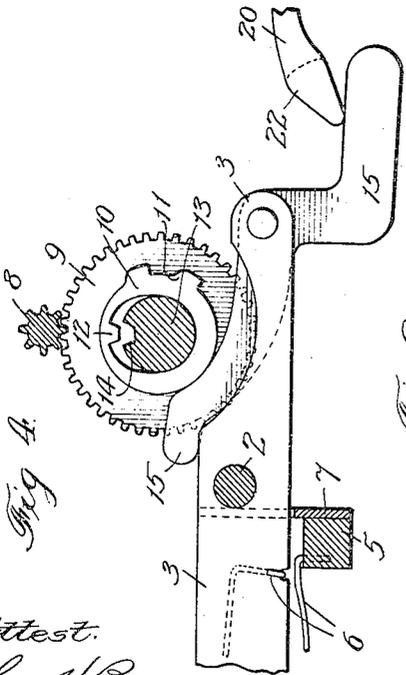


Fig. 4.

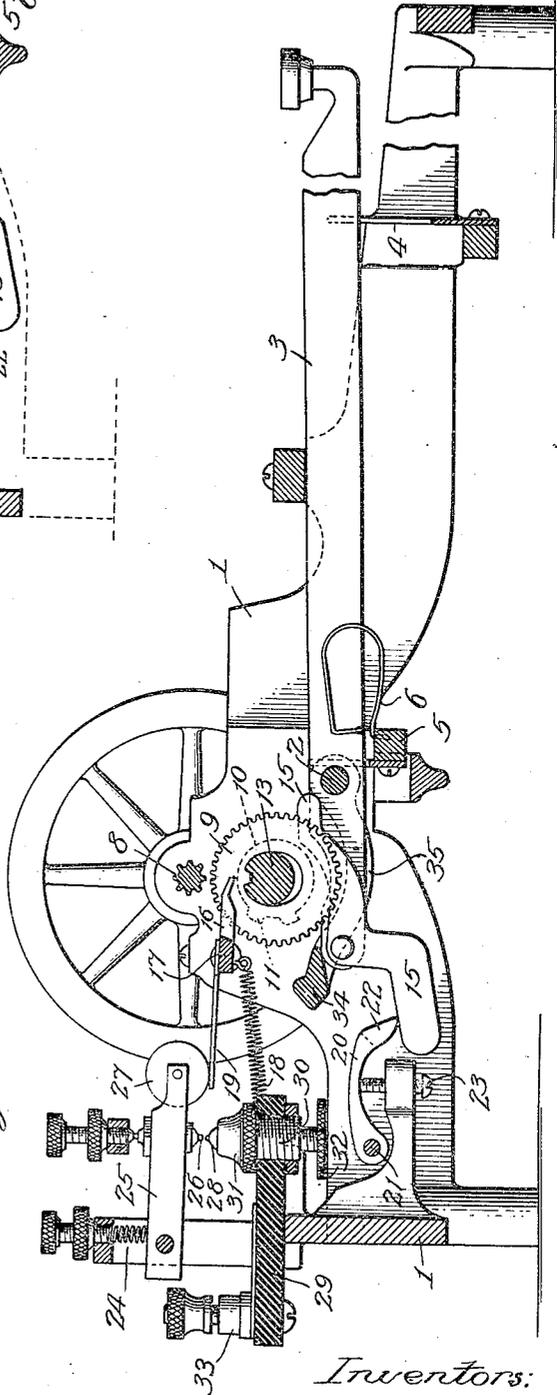


Fig. 2.

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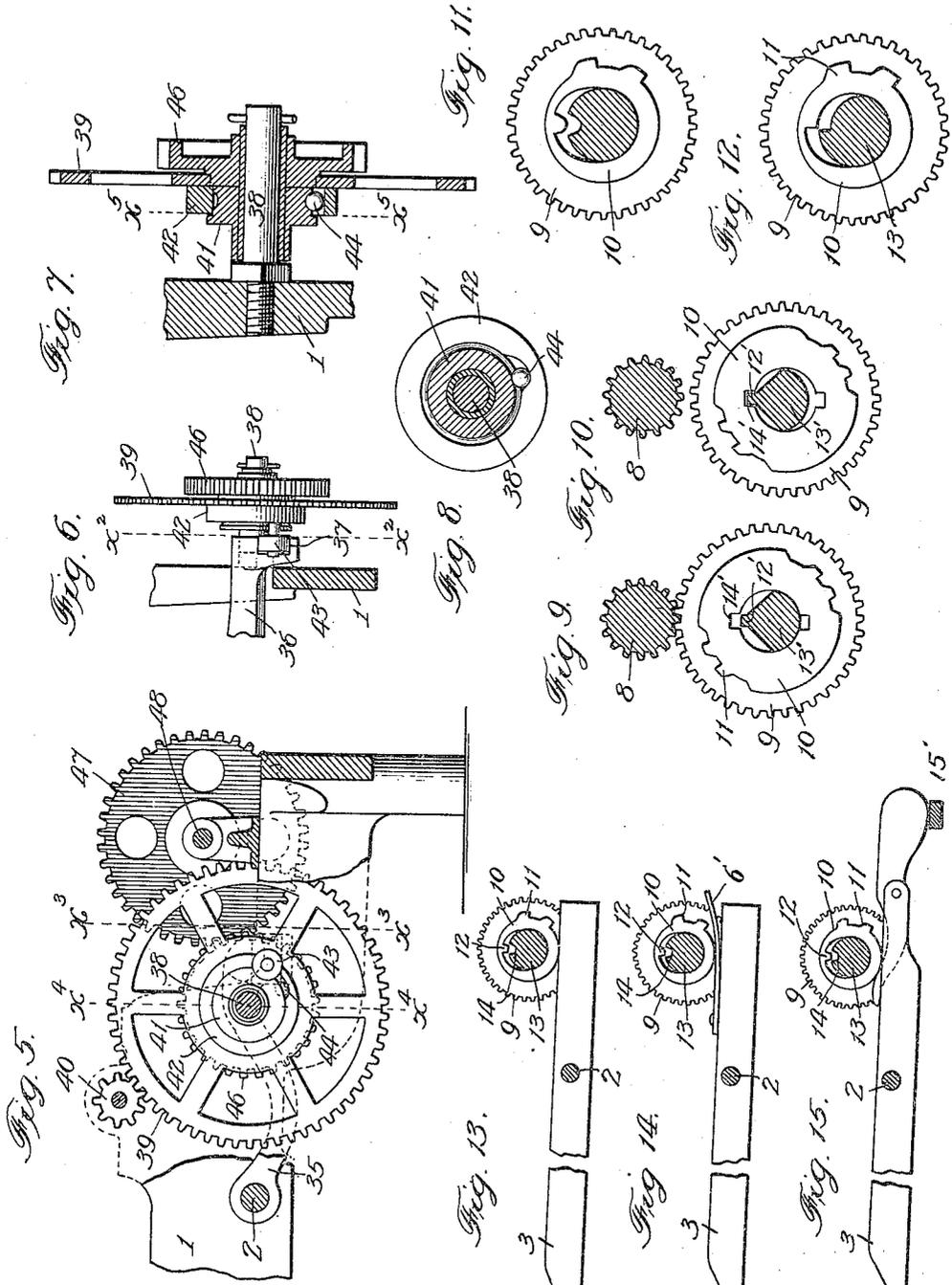
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3 SHEETS—SHEET 3.



Attest:
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UNITED STATES PATENT OFFICE.

ELWOOD C. PHILLIPS AND THOMAS RHODUS, OF CHICAGO, ILLINOIS, ASSIGNORS TO PHILLIPS TELEGRAPH INSTRUMENT COMPANY, OF PHOENIX, ARIZONA, A CORPORATION OF ARIZONA.

TELEGRAPH-TRANSMITTER.

1,064,373.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed February 17, 1912, Serial No. 678,383. Renewed November 4, 1912. Serial No. 729,474.

To all whom it may concern:

Be it known that we, ELWOOD C. PHILLIPS and THOMAS RHODUS, citizens of the United States of America, and residents of Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Telegraph-Transmitters, of which the following is a specification.

This invention relates to that type of telegraph transmitters in which the sending of the series of letters or symbols constituting a message is effected by the manual actuation of a series of key bars or levers, each of which is individual to an individual character device producing one specific letter or symbol. And the present improvement has for its various objects, to provide a simple and durable structural formation and combination of parts, in which the series of individual character devices operate a single main circuit make and break mechanism common to the series, and with which the starting and stopping of the individual character devices at the proper periods, and in proper positions for succeeding operations are attained in a certain efficient manner: to provide a simple and efficient combination of parts, whereby a continuous rotation is automatically imparted to the primary driving wheel or drum of the transmitter by the serial movements of the key levers in the performance of their other duty of operating series of individual character devices in the sending of a message, and to provide a simple and co-acting registering means operating in unison with the transmitter mechanism and adapted to produce a transcript of the message as sent, all as will hereinafter more fully appear.

In the accompanying drawings:—Figure 1, is a plan view, with parts removed, of a transmitter embodying the present improvements. Fig. 2, is a longitudinal section, on line $x-x$, Fig. 1. Fig. 3, is a detail longitudinal section on line $x'-x'$, Fig. 1. Fig. 4, is an enlarged fragmentary section, showing a character device and its accessories in an elevated position, the reverse of that illustrated in Fig. 2. Fig. 5, is a detail longitudinal section on line x^2-x^2 , Figs. 1 and 6. Fig. 6, is a detail transverse section on line x^3-x^3 , Fig. 5. Fig. 7, is a similar view on line x^4-x^4 , Fig. 5. Fig. 8, is a fragmentary section on line x^5-x^5 , Fig. 7. Figs.

9, 10, 11 and 12 are detail longitudinal sections of modified forms of the character devices and their accessories. Figs. 13, 14 and 15, are detail longitudinal sections of modified forms of the operative connections between the key levers and the character devices.

Similar reference numerals indicate like parts in the several views.

Referring to the drawings, 1 represents the stationary supporting frame, to which a transverse rod 2 is attached at its respective ends, to provide a pivotal support for the series of longitudinally arranged manual key levers 3, of the apparatus.

4 is a transverse comb bar carried by the frame 1, and adapted to impose separated relation upon the forward ends of the key levers 3, as usual in the present type of transmitters.

5 is a transverse supporting bar carried by the frame 1, at a point in front of the pivot rod 2, aforesaid, and affording points of attachment for the series of individual springs 6, by which an upward tendency is imparted to the forward ends of the series of key levers 3, aforesaid.

7 is a supplementary transverse comb bar secured to the supporting bar 6, and adapted to impose separated relation upon the middle portions of the series of key levers 3 aforesaid.

8 is the primary driving wheel or drum of the present apparatus, journaled in side bearings on the frame 1, and having a transverse length approximating the width of said frame to adapt it for driving engagement with any one of the series of individual character devices hereinafter described. Said driving wheel or drum 8, will receive constant rotation during the practical use of the apparatus, and preferably from a driving mechanism hereinafter described, and which in turn is operated by the movement of the series of key levers 3 of the apparatus.

The individual character devices above referred to have separated relation imposed upon them by the key bars 3 and will each comprise a detail construction of parts preferably as follows: 9 is a driven wheel and a character disk the periphery of which is formed with alternate depressions and projections 11, corresponding with the dif-

ferent characters of the Morse or like telegraph code or alphabet; the depressions corresponding with the spaces and the projections with the dots and dashes of such code. Each character disk 10 is fixedly attached to its driven wheel 9 to rotate in unison therewith, and is preferably of a smaller diameter than said driven wheel to allow the said driven wheel 9 when in action to engage the main driving wheel or drum 8, and to provide an annular recess at the side of the driven wheel 9 for the movement below the character disk 10 of an individual key lever 3 and also above the said character disk for an individual selective finger 16 hereinafter described. In the present improvement the central carrying web of each character device, in order to permit vertical movement thereof, is formed with an oval bore, which in turn is preferably provided with an instanding tongue 12, preferably formed smaller at the bottom than at the top, located preferably at the greater diameter of said oval bore, as shown in Figs. 2, 4, 9, 10, 11 and 12, in order to prevent vertical movement of the character devices during rotation and for the purpose hereinafter stated.

13 is a fixed transverse shaft carried by the main frame, and upon which the series of character devices above described, are revolutely supported independent of each other and by means of their oval bores aforesaid.

In the preferred form of the present invention illustrated in Figs. 2 and 4 of the drawings, 14 is a longitudinal holding groove or channel preferably smaller at the bottom than at the top, formed in the crown of the periphery of the shaft 13 and extending the full length of the same. Said groove 14 normally receives the aforesaid instanding tongue 12 of the series of character devices, so that the same are removed from their normal center of rotation sufficiently to disengage the driven wheels 9, after each rotation from the main driving wheel or drum 8 to hold the character devices against rotation and in the proper position for the next operation.

In the present improvement each individual character device, when idle and held in groove 14 against rotation is capable of limited vertical movement upward, upon the shaft 13, a distance equal to the depth to which its tongue 12 enters the groove 14, which distance is greater than that which separates the driven wheel 9 from the primary driving wheel 8, so that when an individual character device is moved upward by its secondary key lever 15 as hereinafter described in detail, the driven wheel 9 moves into operative engagement with the primary driving wheel 8 to receive rotation therefrom and the tongue 12 moves out of engage-

ment with the groove 14 of the fixed shaft 13. The tongue 12 and the driven wheel 9, being parts of the same character device move equally, but owing to the fact that the distance which separates the driven wheel 9 from the primary driving wheel 8 is smaller than the distance which the tongue 12 has to move upward in order to get out of engagement with the holding groove 14, two results follow; first, the driven wheel 9 when moved upward will come into operative engagement with the primary driving wheel 8 and begin to rotate therewith before the tongue 12 has moved entirely out of engagement with groove 14, and for this reason the said tongue 12 in the series of character devices and the said groove 14 in the holding shaft 13, are preferably formed larger at the top than at the bottom, so as to permit such action without interference. And in that the individual driven wheel 9, is held by the tongue 12 in operative engagement with the primary driving wheel 8 during the rotation of the character device, vertical movement of the same is prevented until the tongue 12 of the individual character device is received again by the holding groove 14. It is within the scope of this part of the present invention to reverse the arrangement of the tongue and groove connection above described between the series of character devices and the fixed supporting shaft 13, by the formation of a single tongue or spline 12' upon and extending the full length of the fixed shaft 13', and the formation of a series of individual grooves 14' in the oval bores of the series of character devices as illustrated in Figs. 9 and 10; in this case, the top of the said tongue and of the said grooves being preferably smaller than the bottom. It is also within the scope of the invention to duplicate the aforesaid individual grooves 14 or their equivalent individual tongue 12', with a corresponding duplication of the alternate character depressions 11, in manner illustrated in Figs. 9 and 10, and for the purpose of affording greater speed of message transmission, when the same is desired. It is also within the scope of the present invention to vary the cross-sectional shape of the aforesaid engaging tongue and grooves, by imparting thereto the rounded form illustrated in Fig. 11, or the single offset or shoulder form shown in Fig. 12.

15 are a series of secondary levers pivoted to the rear ends of the key levers 3. In the preferred form of the same as shown in Figs. 1, 2, 3 and 4, the forward portion of each secondary lever 15 is adapted, when in action, to have bearing against the underside of its character disk 10 and is preferably concaved at such point, as shown, to provide a more extended and efficient bearing between the parts. When not in action each

secondary lever 15 is out of bearing contact with its character disk 10 and preferably rests upon the transverse rod 2 aforesaid. The rear end of each secondary lever 15 projects back into operative engagement with the hereinafter described transversely arranged frame, that is common to the entire series of secondary levers, and the function of which is to raise the forward end of any particular secondary lever 15, when the key lever 3 is manually actuated in the operation of the apparatus, as hereinafter more particularly set forth.

In the modified form of key lever illustrated in Fig. 13, the key lever 3 is adapted to have direct engagement with the underside of an individual character disk 10, while in Fig. 14, the arrangement shown in Fig. 13, is further modified by the interposition of a spring 6', the normal tendency of which is to depress the rear end of the key lever 3 to which it is individually connected.

In another modified form of the key lever illustrated in Fig. 15, the feature of the secondary lever is retained and the rear end of the same made heavier than its forward end, so that the excess weight of said rear end is sufficient to effect the required upward movement of the front end of the lever, and with it the particular character device into action. With such construction a fixed stop 15' will be provided to restrict the downward movement of the weighted rear end of the secondary lever 15, aforesaid.

16 are a series of selective fingers arranged in a plane above and projecting over the aforesaid series of character disks 10, and individual thereto.

17 is a transverse bar pivoted at its respective ends in the main frame 1, and adapted to carry in common the aforesaid series of selective fingers 16, and to such end the selective fingers 16 and the bar 17 are preferably as integrally connected parts.

18 is a spring tending to move the bar 17 and selective fingers 16, in the direction opposite to that in which said parts are moved by the projections 11 of the character disks 10.

With the above described construction, in an active operation of an individual selective finger 16, the forward end of the same is adapted to bear upon the periphery of its character disk 10, and receive from the depressions and projections 11 thereof, in conjunction with the spring 18, intermittent oscillatory movement, as said character disk rotates.

19 is a single contact making and breaking arm carried by the transverse bar 17 aforesaid, and extending rearwardly from the same for operative engagement with the main line circuit making and breaking mechanism hereinafter described.

20 is one or more yoke shaped frames pivoted in the main frame 1 and preferably on a transverse pivot rod 21 as shown. Said frames are provided at their forward and free ends with transversely extending bars 22, which in a normal position of the parts extend across and slightly above the rear portions of the secondary levers 15, aforesaid. And so that in the actual operation of the mechanism, as any particular secondary lever 15 is raised bodily by its manual lever 3, the rear portion of said secondary lever is brought up against a transverse bar 22, and the gravity stress of said bar and its pivoted carrying frame 20, is adapted, in turn, to effect a pivotal movement of said secondary lever 15 upon its manual lever 3 and cause the forward portion of said secondary lever to move upward. Such upward movement of the forward portion of the secondary lever is adapted to lift the driving gear 9 of a particular character device into operative engagement with the primary driving gear 8 aforesaid. In that the downward stress of the said bar 22 is due to its weight the result is a yielding operative connection between the series of key levers 3 and secondary levers 15, which prevents any undue frictional engagement between said secondary levers and the character disks 10 in the practical operation of the parts. With a view to lighten the touch upon the key levers 3, a plurality of said bars 22, as shown and as heretofore described, are preferably employed.

23 is an adjustable abutment screw by which the downward movement of the transverse bar 22, is regulated, and prevented from normal engagement upon the series of secondary levers 15.

24 is a vertical bracket member attached to the rear end of the main frame 1, and affording pivotal support for the oscillating carrying arm 25 of the movable contact point 26 of the main line circuit making and breaking mechanism. At its forward end the arm 25 has bearing, preferably through a wheel or roller 27, upon the rear arm 19 of the selective fingers 16 before described, and adapted to receive an upward oscillation therefrom. It is within the scope of this part of the present invention to extend the arm 19 rearwardly and mount the movable contact point 26, thereon, where a simpler type of construction is required.

28 is a companion stationary contact point arranged beneath the contact point 26, aforesaid, and in vertical alignment therewith. In the construction shown, the movable contact member 26 forms one terminal for the main line circuit, while the stationary contact point 28 forms the other terminal for said line circuit, with the two

contact points supported in insulated relation to each other in any ordinary manner and preferably by mounting the stationary contact point upon a fixed shelf 29 of the main frame in the insulated and adjustable manner now to be described.

30 is a screw-threaded spindle turning in a bushing 31 secured in a bore formed therefor in the insulating material of the shelf 29 aforesaid. Said spindle carries at its upper end the aforesaid contact point 28 and at its lower end an adjusting thumb nut or head 32, by which its vertical adjustment is effected.

33 is a terminal post secured to the shelf 29, and electrically connected to the bushing 31 and spindle 30, aforesaid.

34 is a yoke or frame, the transverse member of which arranged immediately above the rear ends of the series of key levers 3, and adapted for operative engagement therewith, while the side members 35 of said frame or yoke 34, extend forward and are pivotally attached to the pivot shaft 2 of the key levers 3 aforesaid. As so arranged the aforesaid transverse member of the yoke 34 is common to the series of key levers and adapted to receive motion from any one of the same, and forms a part of driving mechanism about to be described, through which the serial movements of the key levers 3 impart rotation to the primary driving wheel 8.

36 is a laterally extending arm on one end of the yoke frame 34, and adapted to oscillate therewith. The outer end of said arm is formed with a slot or groove 37 for operative engagement with the wrist pin of a clutch mechanism hereinafter described.

38 is a shaft arranged at one side of the main frame 1, and adapted to support a loosely mounted gear wheel 39 having driving engagement with a pinion 40 secured to one end of the primary driving wheel or drum 8 of the series of individual character devices heretofore described.

41, is the driven member of the clutch above referred to, and fixed to one side of the gear wheel 39 aforesaid. 42 is the driving member of said clutch, loosely mounted on the shaft 38 aforesaid, in operative relation to the driven clutch member 41, and provided with a wrist pin 43 adapted for engagement with the slot or groove 37 of oscillating arm 36 above described, and which in its oscillations is adapted to impart a circular oscillation to said wrist pin 43 and driving member 42, aforesaid. The driving member 42 is adapted to turn to have driving engagement by any usual intermediate means with the driven clutch member 41, when moved in one direction by the arm 36 aforesaid, and be free from such driving connection when moved in the opposite direction by said arm. As the inter-

mediate connecting means above referred to, we have shown in Figs. 5, 7 and 8, a clutch ball 44 arranged in a suitable pocket between the driven and driving clutch members 41 and 42. The scope of this part of the present invention embraces however the use of any ordinary and equivalent means for attaining an intermittent connection between the clutch members in one direction.

The above described mechanism is adapted to impart substantially continuous rotation to the primary driving wheel or drum 8 of the apparatus, through the succeeding rotative impulses which are imparted by the succeeding actuations of the key levers 3, to the said wheel or drum 8, through the intermediate driving and clutch mechanism above described, in the actual use of the apparatus.

45 is a fly wheel, or like momentum storage device, carried by or operatively connected to the aforesaid driving wheel or drum 8, and adapted to render the rotation thereof more uniform and long continued, under the intermittent rotative impulses imparted by the above described operative connections.

46 is a secondary gear wheel moving loosely upon the shaft 38, aforesaid, and in unison with the driving clutch member 42, above described, and having in turn driving engagement with a gear wheel 47 on the operating shaft of the recording web feeding attachment now to be described.

48 is the shaft above referred to, journaled on the main frame 1, and carrying in addition to the gear wheel 47 aforesaid, a feeding drum 49, which in connection with a superimposed idler drum 50 is adapted to impart travel to the recording web or strip 51 of paper or the like, from a supply reel 52, through the recording appliance hereinafter described, and in unison with the message transmitting mechanism heretofore described.

53 is a transverse guide throat arranged between the supply reel 52 and the feeding drums 49 and 50, and adapted to prevent undue lateral movement of the web or strip 51, in its passage between said reel and drums. Said guide throat 53 also provides a support or platen for said strip during the recording operation.

54 is a recording pen carried by a rearwardly extending holder attached to the oscillating bar 17 heretofore described, and adapted to oscillate in unison with said bar 17 and selective fingers 16, so that when an individual selective finger 16, bearing upon the periphery of an individual character disk 10, falls into a depression thereof, the pen 54 is raised, and when said selective finger encounters a projection 11 on said character disk 10, the pen 54 is depressed and makes a record of the part of the message or symbol which is being transmitted.

Accordingly an exact record of the projections and depressions on the periphery of the character disks 10, and representing the symbols or characters constituting the message sent, is automatically registered on the record strip 51 aforesaid.

55 is an inkwell supported on the main frame 1, and adapted to supply ink to the recording pen 54, in the ordinary manner.

10 The operation of the present mechanism is as follows:—The primary driving wheel or drum 8 receives substantially constant rotation from the intermediate operating mechanism between said wheel or drum 8, and the series of key levers 3 of the apparatus, as heretofore described in detail. Said rotation may however be attained from an independent power source when desired. The normal position of the series of individual character devices with relation to the aforesaid primary driving wheel 8, is a disconnected one, and accidental rotation is prevented by the engagement of the instanding tongues 12 of said devices, with the groove 14, of their stationary supporting shaft 13. With the actuation of a particular key lever 3, and through the identical serial movement of the key levers 3 which impart rotation to the primary driving wheel 8, the driven wheel 9 of the series of individual character devices are one at a time lifted by the action of the rear end of a key lever upon an individual secondary lever 15, into operative engagement with the rotating primary driving wheel 8. In the described lifting movement of the driven gear 9 and character disk 10, the holding tongue 12 thereof is at the same time lifted out of the holding groove 14 of the shaft 13, and is held in such position until the rotation of the gear wheel 9 moves the said holding tongue out of alinement with the holding groove 14 aforesaid. The individual character disk 10 is now in its active position for use in sending a message and is adapted to work in conjunction with the spring 18, to impart oscillatory movement to an individual selective finger 16, and its carrying bar 17 and contact operating arm 19, and through the same actuate the single main circuit make and break mechanism, hereinbefore described. With a release of the aforesaid individual key lever from the touch of the operator, said lever returns to its normal position, and the aforesaid character device will finish its circular travel or rotation, and automatically return to the normally dormant position first described.

In the present construction the weight of the pivoted transverse bars 22, is pressed upon to hold an individual secondary lever 15 to its lifting engagement with a particular character device, the pressure depending upon the weight of the particular bar 22, and accordingly excessive friction between

the parts is prevented, when too great a movement is imparted to a key lever 3, as for instance in giving the clutch operating mechanism heretofore described in detail, an extended actuation in attaining an automatic and simultaneous operation of the primary driving wheel or drum 8.

The coacting relation and operation of the message recording attachment has been fully set forth in the detail description of the same, and requires no further mention in this connection.

Having thus fully described our said invention what we claim as new and desire to secure by Letters Patent, is:—

1. A telegraph transmitter comprising in combination, a primary driving wheel adapted for constant rotation, a circuit make and break mechanism, a series of character devices, each character device comprising a driven wheel provided with a journal bore and means for imparting intermittent action to the circuit make and break mechanism, a stationary shaft forming a bearing in common for the series of character devices, the stationary shaft and journal bore of each character device being provided with means for holding said character device during rotation in operative engagement with the primary driving wheel, and individual means for moving each character device into operative engagement with the primary driving wheel, substantially as set forth.

2. A telegraph transmitter comprising in combination, a primary driving wheel adapted for constant rotation, a circuit make and break mechanism, a series of character devices, each character device comprising a driven wheel provided with a journal bore and means for imparting intermittent action to the circuit make and break mechanism, a stationary shaft forming a bearing in common for the series of character devices, the stationary shaft and journal bore of each character device being provided with means for holding said character device during rotation in operative engagement with the primary driving wheel, means for permitting said character device to move out of operative engagement with the primary driving wheel and for normally locking said character device against rotation, and individual means for moving each character device into operative engagement with the primary driving wheel, substantially as set forth.

3. A telegraph transmitter comprising in combination, a primary driving wheel adapted for constant rotation, a circuit make and break mechanism, an intermediate mechanism for operating the circuit make and break mechanism, a series of character devices, each character device comprising a driven wheel provided with a journal bore and means for imparting intermittent ac-

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tion to said intermediate mechanism, a stationary shaft forming a bearing in common for the series of character devices, the stationary shaft and journal bore of each character device being provided with means for holding said character device during rotation in operative engagement with the primary driving wheel, and individual means for moving each character device into operative engagement with the primary driving wheel, substantially as set forth.

4. A telegraph transmitter comprising in combination, a primary driving wheel adapted for constant rotation, a circuit make and break mechanism, an intermediate mechanism for operating the circuit make and break mechanism, a series of character devices, each character device comprising a driven wheel provided with a journal bore and means for imparting intermittent action to said intermediate mechanism, a stationary shaft forming a bearing in common for the series of character devices, the stationary shaft and journal bore of each character device being provided with means for holding said character device during rotation in operative engagement with the primary driving wheel, means for permitting said character device to move out of operative engagement with the primary driving wheel and for normally locking said character device against rotation, and individual means for moving each character device into operative engagement with the primary driving wheel, substantially as set forth.

5. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and break mechanism, a series of selective levers controlling the circuit make and break mechanism, and individual means for moving each character device into operative engagement with the primary driving wheel, substantially as set forth.

6. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and

break mechanism, a series of selective levers controlling the circuit make and break mechanism, and individual key levers for moving each character device into operative engagement with the primary driving wheel, substantially as set forth.

7. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking wheels and disks against rotation, a series of individual selective levers engaging said character disks, a circuit make and break mechanism common to the series of selective levers, and individual means for moving each driven wheel and disk into operative engagement with the primary driving wheel, substantially as set forth.

8. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking wheels and disks against rotation, a series of individual selective levers engaging said character disks, a circuit make and break mechanism common to the series of selective levers, and individual key levers for moving each driven wheel and disk into operative engagement with the primary driving wheel, substantially as set forth.

9. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and break mechanism, a series of selective levers controlling the circuit make and break mechanism, and individual means for moving each character device into operative engagement with the primary driving wheel, said wheels having a greater diameter than the character disks and adapted to impose separated relation on the series of selective levers, substantially as set forth.

10. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and break mechanism, a series of selective levers controlling the circuit make and break mechanism, and individual key levers for moving each driven wheel and disk into operative engagement with the primary driving wheel, said wheels having a greater diameter than the character disks and adapted to impose separated relation on the series of selective levers and key levers, substantially as set forth.

11. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said wheels and disks against rotation, a series of individual selective levers engaging said character disks, a circuit make and break mechanism, common to the series of selective levers, and individual means for moving each driven wheel and disk into operative engagement with the primary driving wheel, said wheels having a greater diameter than the character disks and adapted to impose separated relation on the series of selective levers, substantially as set forth.

12. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said wheels and disks against rotation, a series of individual selective levers engaging said character disks, a circuit make and break mechanism common to the series of selective levers, and individual key levers for moving each driven wheel and disk into operative engagement with the primary driving wheel, said wheels having a greater diameter than the character disks and adapted to impose separated relation on the series of

selective levers and key levers, substantially as set forth.

13. A telegraph transmitter comprising in combination, a primary driving wheel adapted for continuous rotation, a series of circuit controlling mechanisms, each comprising a driven wheel and a character disk connected together and provided with a journal bore of an elongated shape and with an instanding tooth in said bore, a stationary shaft forming a bearing in common for the aforesaid series of circuit controlling mechanisms and having a longitudinal groove adapted for engagement with a series of the instanding teeth aforesaid, a series of selective fingers engaging said circuit controlling mechanisms, a make and break mechanism operatively connected to said selective fingers, and individual means for moving each circuit controlling mechanism into operative engagement with the primary driving wheel, substantially as set forth.

14. A telegraph transmitter comprising in combination, a primary driving wheel adapted for continuous rotation, a series of circuit controlling mechanisms, each comprising a driven wheel and a character disk connected together and provided with a journal bore of an elongated shape and with an instanding tooth in said bore, a stationary shaft forming a bearing in common for the aforesaid series of circuit controlling mechanisms and having a longitudinal groove adapted for engagement with a series of the instanding teeth aforesaid, a series of selective fingers engaging said circuit controlling mechanisms, a make and break mechanism operatively connected to said selective fingers, and individual key levers adapted to move each circuit controlling mechanism into operative engagement with the primary driving wheel, substantially as set forth.

15. A telegraph transmitter comprising in combination, a primary driving wheel adapted for continuous rotation, a series of circuit controlling mechanisms, each comprising a driven wheel and a character disk connected together and provided with a journal bore of an elongated shape and with an instanding tooth in said bore, a stationary shaft forming a bearing in common for the aforesaid series of circuit controlling mechanisms and having a longitudinal groove adapted for engagement with a series of the instanding teeth aforesaid, a series of selective fingers engaging said circuit controlling mechanisms, a make and break mechanism operatively connected to said selective fingers, and individual means for moving each circuit controlling mechanism into operative engagement with the primary driving wheel, the series of driven wheels having a greater diameter than the charac-

ter disks and adapted to impose separated relation upon the series of selective fingers, substantially as set forth.

16. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and break mechanism, a series of selective levers controlling the circuit make and break mechanism, individual key levers for moving each character device into operative engagement with the primary driving wheel, and an oscillatory frame pivoted in the main frame and adapted to exert a gravity stress upon the rear ends of a plurality of the key levers, substantially as set forth.

17. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and break mechanism, a series of selective levers controlling the circuit make and break mechanism, individual key levers for moving each character device into operative engagement with the primary driving wheel, and a series of secondary levers pivoted to the rear ends of the key levers and having bearing beneath the individual character devices, substantially as set forth.

18. A telegraph transmitter comprising in combination, a driving wheel adapted for constant rotation, a series of character devices, each comprising a driven wheel and a character disk connected together and provided with a journal bore, a stationary shaft forming a bearing in common for the aforesaid series of wheels and disks, the shaft and journal bore of each connected wheel and disk being provided with engaging means for normally locking said character devices against rotation, a circuit make and break mechanism, a series of selective levers controlling the circuit make and break mechanism, individual key levers for moving each character device into operative engagement with the primary driving wheel, a series of secondary levers pivoted to the rear ends of key levers and having bearing beneath the

individual character devices, and an oscillatory frame pivoted in the main frame and having bearing upon the rear ends of a plurality of the secondary levers aforesaid, substantially as set forth.

19. In a telegraph transmitter, the combination of a primary driving wheel, a series of circuit controlling mechanisms adapted to have individual driven engagement with said driving wheel, a series of individual means for moving said mechanisms into operative engagement with said driving wheel, and operative connections between said individual moving means and driving wheel for imparting rotation to the same, substantially as set forth.

20. In a telegraph transmitter, the combination of a primary driving wheel, a series of circuit controlling mechanisms adapted to have individual driven engagement with said driving wheel, a series of individual key levers for moving said mechanisms into operative engagement with said driving wheel, and operative connections between said individual key levers and the driving wheel for imparting rotation to the same, substantially as set forth.

21. In a telegraph transmitter, the combination of a primary driving wheel, a series of circuit controlling mechanisms adapted to have individual driven engagement with said driving wheel, a series of individual means for moving said mechanisms into operative engagement with said driving wheel, and operative connections between said individual moving means and the driving wheel for imparting rotation to the driving wheel, the same comprising a pinion fixed on the arbor of the driving wheel, a gear wheel mounted for operative engagement with said pinion, a driven member of a clutch secured to said gear wheel, a driving member of said clutch mounted in operative relation to the driven member aforesaid, and means for imparting circular oscillation to said driving clutch member, the same comprising an oscillating arm having operative engagement with the series of moving means aforesaid, substantially as set forth.

22. In a telegraph transmitter, the combination of a primary driving wheel, a series of circuit controlling mechanisms adapted to have individual driven engagement with said driving wheel, a series of individual means for moving said mechanisms into operative engagement with said driving wheel, and operative connections between said individual moving means and the driving wheel for imparting rotation to the driving wheel, the same comprising a pinion fixed on the arbor of the driving wheel, a gear wheel mounted for operative engagement with said pinion, a driven member of a clutch secured to said gear wheel, a driv-

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ing member of said clutch mounted in operative relation to the driven member aforesaid, and means for imparting circular oscillation to said driving clutch member, the same comprising an oscillating member having operative engagement with the series of key levers, aforesaid, substantially as set forth.

23. In a telegraph transmitter, the combination of a primary driving wheel, a series of circuit controlling mechanisms adapted to have individual driven engagement with said driving wheel, a series of individual means for moving said mechanisms into operative engagement with said driving wheel, a series of selective fingers engaging said circuit controlling mechanisms, a single make and break mechanism common to the series of selective fingers, a recording pen carried by the movable member of said make and break mechanism, and means for feeding a record strip or web past said pen during the operation of the apparatus, substantially as set forth.

24. In a telegraph transmitter, the combination of a primary driving wheel, a series

of circuit controlling mechanisms adapted to have individual driven engagement with said driving wheel, a series of individual means for moving said mechanisms into operative engagement with said driving wheel, a series of selective fingers engaging said circuit controlling mechanisms, a single make and break mechanism, common to the series of selective fingers, a recording pen carried by the movable member of said make and break mechanism, and means for feeding a record strip or web past said pen during the operation of the apparatus, the same comprising a feed drum operatively connected to the operating mechanism of the primary driving wheel aforesaid, and an idler drum coacting with said feed drum, substantially as set forth.

Signed at Chicago, Illinois, this 15th day of February, 1912.

ELWOOD C. PHILLIPS.
THOMAS RHODUS.

Witnesses:

ROBERT BURNS,
HENRY MOE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."