

J. E. WRIGHT.
 PRINTING TELEGRAPH RECEIVER.
 APPLICATION FILED OCT. 1, 1913.

1,140,861.

Patented May 25, 1915.
 4 SHEETS—SHEET 1.

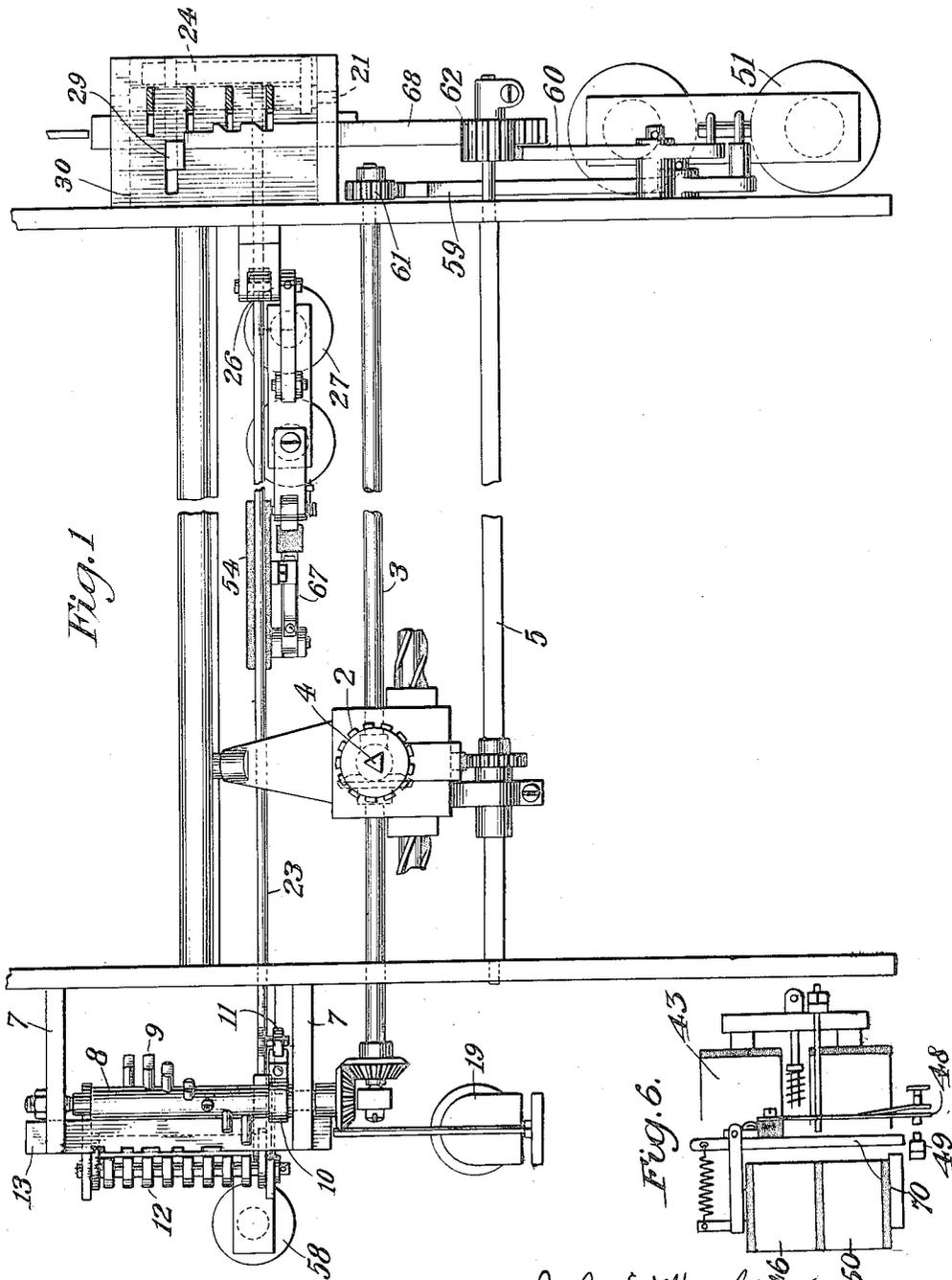


Fig. 1

Fig. 6.

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 Thomas J. Byrne.

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 By his Attorneys
 Kerr, Page, Cooper & Hayward.

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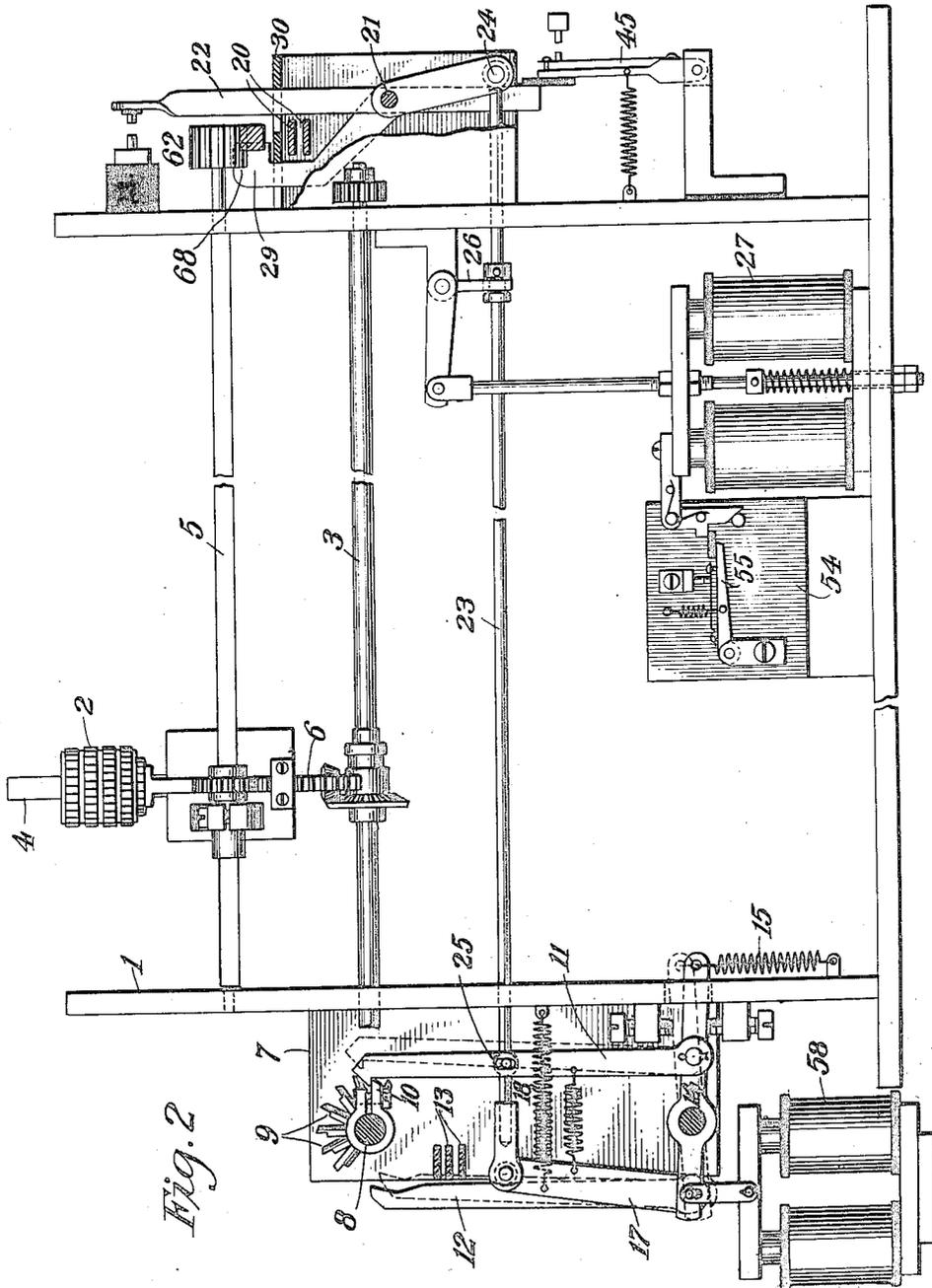


Fig. 2

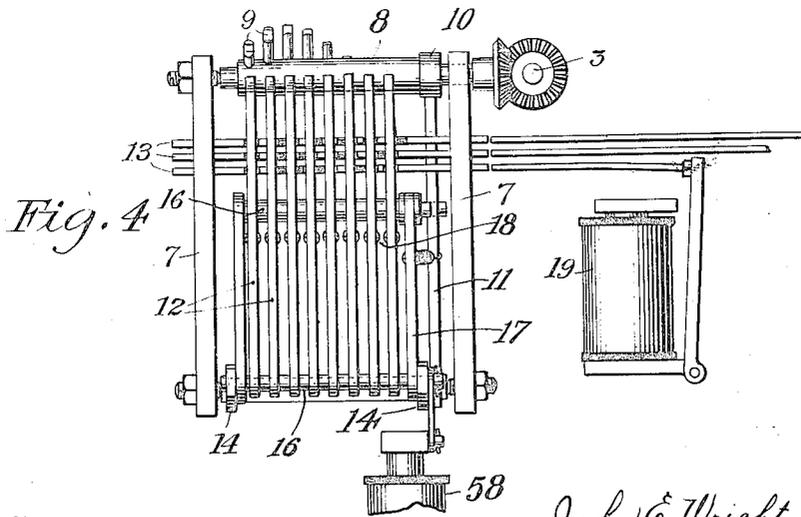
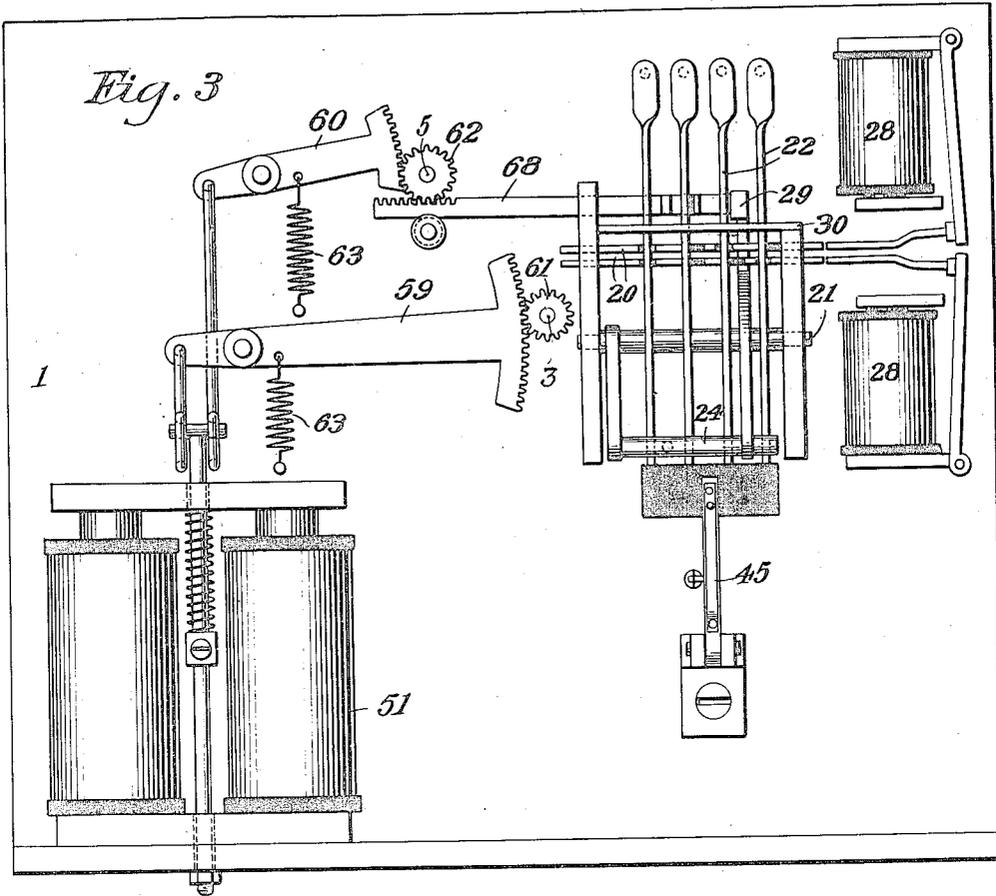
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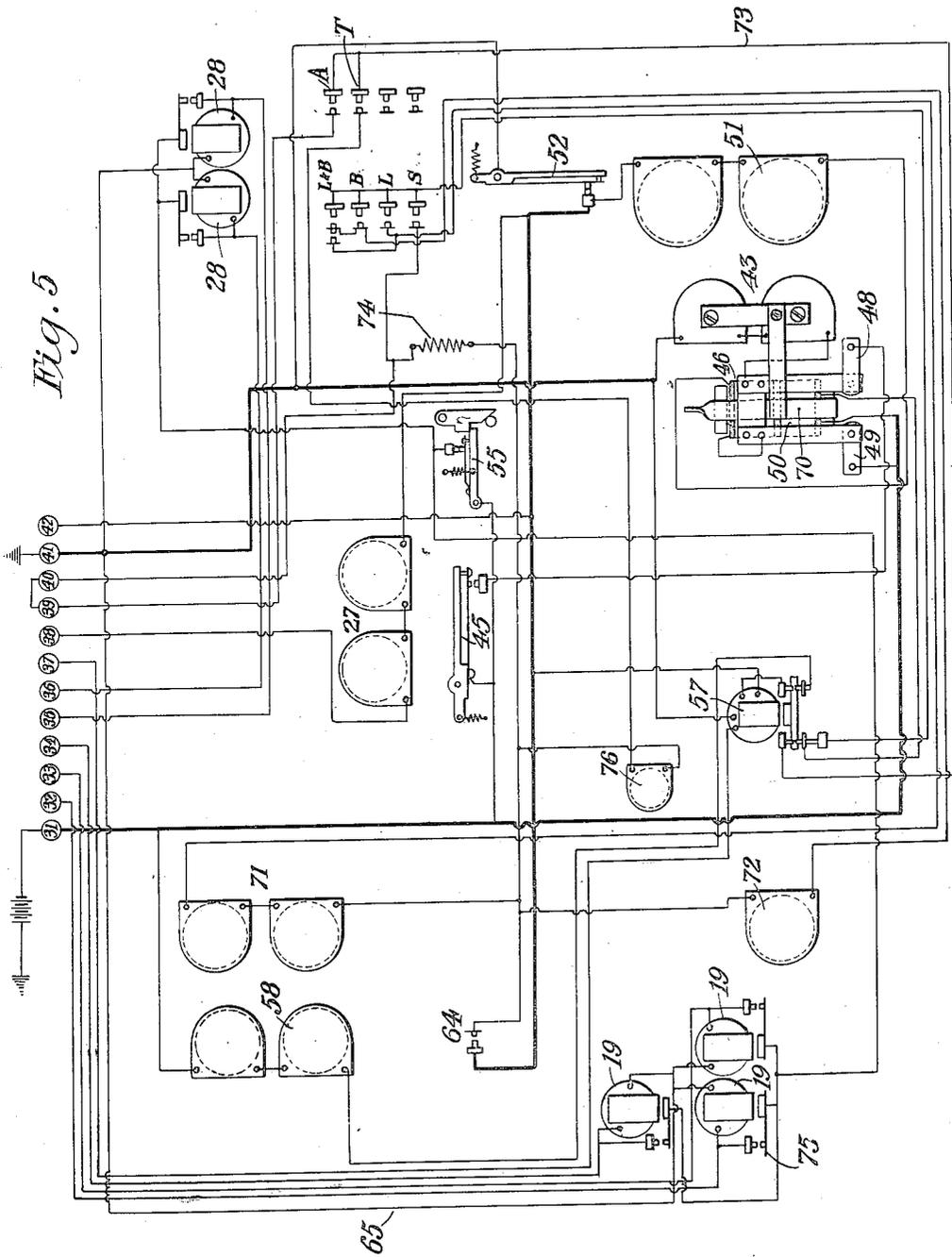
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOHN E. WRIGHT, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WRIGHT TELEGRAPHIC TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

PRINTING-TELEGRAPH RECEIVER.

1,140,861.

Specification of Letters Patent. Patented May 25, 1915.

Application filed October 1, 1913. Serial No. 792,712.

To all whom it may concern:

Be it known that I, JOHN E. WRIGHT, a citizen of the United States, residing at Pittsburgh, county of Allegheny, and State of Pennsylvania, have invented certain new and useful Improvements in Printing-Telegraph Receivers, of which the following is a full, clear, and exact description.

In certain printing telegraph systems it is usual to employ what may be called a translator which comprises a combination of slide bars and levers, or their equivalents, set by suitable line controlled mechanism to effect the closing of one or more circuits in the receiver. The setting of the translator is generally brought about by means of electro-magnets in a plurality of circuits through which impulses of current are directed by the operation of sun-flower disks or like means and the circuit or circuits of the receiving instrument contain electro-magnets so that when such circuits are closed the desired operations are carried out.

One of the main objects of this invention is to consolidate the translator and receiver into a unitary instrument, and to effect the adjustment of the type wheel and the other operations necessary in the receiver, by the direct mechanical action of the levers of the translator, thus dispensing to a very large extent with the electro-magnets and contacts heretofore employed.

Other important features of my invention reside in the means employed for turning the type wheel to bring any desired character to the printing position and to print the same, and in the provision which is made for securing different combinations and permutations of the controlling mechanism, whereby a large number of different characters may be printed and other operations performed by the use of a small number of line impulses for each signal or combination of impulses.

The invention is a development of and improvement on the printing telegraph system heretofore described and claimed by me in patents granted to me as follows:—Nos. 1,090,365; 1,090,366; 1,090,367 and 1,090,368, dated March 17, 1914.

The particular improvements constituting my present invention are illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of the apparatus. Fig. 2 is a view of the same in ele-

vation. Fig. 3 is an end view in elevation of Fig. 1 looking toward the left. Fig. 4 is a view of the operative portions of the apparatus looking toward the right; and Fig. 5 is a diagram of circuit connections.

The frame of the instrument is that of the receiver or printing machine and is designated by the numeral 1. It will be understood that such parts only of the apparatus as enter directly into the present invention are illustrated in detail in the drawings, and that such parts as are not thus illustrated are or may be the same as those in my former applications.

Considering the receiver as a whole, 2 is the type-wheel having four rows of characters. It is turned by a shaft 3 engaging a triangular or square spindle 4 over which it loosely rests and is raised by a shaft 5 engaging a rack bar 6, which is attached to and moves the type wheel longitudinally on its shaft. The particular character on the wheel which is to be presented to printing position is determined by the following mechanism: In suitable side plates constituting a bracket 7, there is mounted a drum or barrel 8, provided with pins or teeth 9 projecting therefrom at different angles, and at one end of said barrel is a stud or arm 10, normally engaged by a hooked bar or lever 11. This lever 11 is pivoted to a rocking bar 14 mounted between the plates 7 and forming one side of a rectangular frame to the end of which a spiral spring 15 from a stationary support is connected. The opposite end of this frame, composed of the bars 14 and cross-bars 16, carries a series of levers 12 and an upright arm 17 drawn toward the right by a spiral spring 18 connected to the frame of the instrument. A series of three slide bars or plates 13, with notches along their forward edges is arranged across the support formed by the side plates 7, which bars or plates are adapted to be slightly shifted by the electro-magnets 19. On the opposite side of the instrument frame and suitably mounted in a bracket attachment thereto, are two parallel notched slide plates or bars 20, and pivoted to a bar 21 are four bars or levers 22 which are adapted to cooperate with the slide bars. A rod 23 entering loosely a socket in a pivoted extension of the upright arm 17, extends across the instrument and bears against the lower end of an arm 24,

which swings around the bar 21 as a center. The lever 11 has a vertical slot 25 into which a pin from this rod enters so that the rod may be moved vertically with respect to the lever at the same time that it is moved horizontally by the engagement therewith of a bell crank lever 26 adapted to be operated by an electro-magnet 27. The slide bars 20 are operated by two electro-magnets 28 and a bar or plate 29 connected with the arm 24 extends upwardly through an opening in the plate 30 in the manner and for the purpose to be hereinafter described.

The above described elements constitute the main features of improvement in this machine and their operation will be understood by reference to Fig. 5. Considering this figure the numerals 32 to 37 designate terminals connected with or controlled by the receiving sun-flower, the nature and purpose of which will be more fully set forth. Terminal 42 is for a condenser. Assume now that a timed impulse or series of impulses constituting a signal according to the Baudot code be received through the sun-flower, it or they will enter by terminals 32 to 37. Let it be supposed that one or more impulses energizes one or more magnets 19 and shifts the corresponding slide bars 13 to bring certain notches in register to determine the character to be printed. The course of such impulse would be as follows: Entering say at terminal 32 the impulse energizes its corresponding magnet 19, proceeding directly to ground at terminal 41. This impulse being momentary would not accomplish its intended purpose, but for the fact that in energizing the magnet 19 it draws up the armature thereof and thereby completes a circuit from the battery terminal 31 to a switch 55, thence through a circuit closer 75 to the ground at terminal 41, through wire 65. This holds the magnet 19 closed until the circuit breaker 55 is operated. The final operation of the sun flower in delivering the impulses of a signal, is to close the circuit from terminal 38 direct to ground through contacts 52 and to thereby energize the magnet 27, with the result that the bar 23 is shifted by the bell crank lever, 26, the lever 11 is caused to release the pin barrel 8 which turns until one of its pins is arrested by a lever 12, which latter acted upon by springs, not indicated in the drawing, enters the registering notches of the three bars 13. By the same impulse of current that operates the magnet 27 the circuits of such magnet or magnets 19 as were energized are interrupted, and the printing magnet 43 is magnetized, these operations being effected in the following manner. At some convenient point, for example, near the magnet 27 is an insulating plate 54 carrying a circuit controller 55 thereon which is normally closed, but when magnet 27 is energized, its arma-

ture, which, as shown in Fig. 2, carries a spring actuated catch 77 adapted, when the armature is drawn into the magnet, to slide off from the lever 55, forces down this circuit controlling lever and interrupts the circuit through magnet or magnets 19. At the same time the magnet operates mechanically a circuit closer 45, shown in diagram in Fig. 5, which draws current from battery to the printing magnet 43, passing through contact 48, and a flat spring 47. This impulse is of extremely short duration because the movement of the printing magnet mechanically depresses armature 70, breaking the circuit at plate 48. Another spring attached to the armature 70, however, closes the contact between itself and a plate 49 and this closing brings battery through the one of two coils 46 of an electromagnet operating the armature 70, the cross feed magnet 51 and the main break 52 operated thereby, to ground 41. The main break 52 is mechanically operated by the action of the cross feed magnet and its movement, of course, interrupts all circuits that are more than momentarily closed and leaves the instrument in readiness for another operation. Again, assume that an impulse or impulses are received by terminals 35 or 36. This will result in the energizing of one or both magnets 28 and the consequent operation of one of levers 22 and the shifting of a bar 68 to a position determined by the lever 22 that may be permitted to turn forward by the adjustment of the sliding bars. The extent of movement of the bar 68 determines the extent to which the type wheel is lifted. Magnets 28 while actuated in the first instance by a momentary current from line are maintained closed by current from battery terminal 31 and are broken by the operation of magnet 27, as has been heretofore described with reference to magnets 19.

In the machine in question many of the characters are brought to the printing position by a slight shift of the type wheel which is effected by means of a magnet 58 and the auxiliary device shown in Fig. 5. When a character, for example, is to be printed that requires the operation of the shift magnet the nearest character row thereto on the type wheel is brought to position and an impulse then sent by the sun flower through terminal 37 to one coil of a magnet 57 to ground. This operates the armature of said magnet and closes a circuit from battery terminal 31 through the shift magnet 58 to ground through main break 52. The magnet 57 has two coils, one of which is in the circuit from terminal 37 to terminal 41, and receives a short impulse of current from a sun flower segment. The other coil of this magnet is in the circuit from terminal 31 through magnet 58 to ground through the main break 52. This

circuit also contains a circuit controller which, when magnet 57 is energized by the sun flower, operates to close the circuit so that magnet 58 will receive current until the operation of the main break 52: The magnet 58 is connected to one end of arm 14 and when thus energized, depresses the arm, lowers the levers 12 and raises the lever 11, with the result that the type wheel will then turn through one full letter space in addition to the movement which it would make with magnet 58 not active.

The power for turning and lifting the type wheel may be of any suitable kind, but I prefer the arrangement illustrated in Fig. 3. In this figure I have shown with the cross feed magnet 51 two controlling levers 59 and 60 connected to the armature of the magnet and having segmental racks at the end respectively in gear with a pinion 61 on the type wheel turning and gear 62 on the type wheel lifting shafts. Spring 63 connected with the oscillating bars tend to move the type wheel. When released, the said springs being put under tension by the movement of the armature of the cross-feed magnet 51, are maintained under tension by the engagement of the lever 11 with the stop 10 on the pin barrel, and by the end of bar 29, on shaft 24, heretofore described.

It will be observed that with the three sliding bars forming a part of the translator for turning the type wheel, it is possible to obtain eight combinations and permutations or in other words to use eight levers and that with two bars in the lifting translator four of such permutations and combinations may be obtained, but that by suitably combining the two, other combinations may be secured whereby various operations in addition to printing characters may be effected by the use of signals composed of a comparatively small number of impulses. I take advantage of this fact by using an eighth lever 12 and also by combining the shift impulse with those sent for lifting the type wheel. In this way I secure combinations by means of which spacing for letters or lines, return of the type wheel, tabulating or partial return of the type wheel, ringing an alarm bell and various other operations may be secured. For example, should I desire to make one or more letter spaces, a combination or combinations of signals is sent that permits the eighth lever, designated in Fig. 5 as 64, to swing forward and in so doing to close an electric circuit in addition to stopping the drum 8 in its first position. All of the levers 22 carry contacts which when the levers have made their full swing, come into engagement with stationary terminals or force movable contacts into engagement therewith. In addition to operating the eighth lever, in the case assumed, an impulse is received from the sun-

flower that permits the lever 22 which is in Fig. 5 indicated by letter S to swing and close its contact. The result will be to complete a circuit from battery through the coil 50, of the electromagnet operating the armature 70, which energizes this magnet, draws down the armature 70 with its attachments, cuts out the print magnet, and directs current from battery through plate 49 carried by the armature 70 through the cross feed magnet and the main break to earth. In the same way if the eighth lever 64 and that one of the lifting levers which is marked L be operated at the same time, battery is directed through the magnet 71 to earth and the paper is fed one line, the other operations described above being also performed. If during the printing of a message it should become necessary to send the type wheel back to begin a line the eighth lever 64 and that marked B are operated. This results in the energizing of a magnet 72 which trips or releases the type wheel carriage and permits it to run back. In like manner by operating the eighth lever and that marked L and B the type wheel carriage is restored to its initial position and the paper fed one line by the closure of the two circuits containing magnets 71 and 72 respectively.

By combining the shift impulse with those which bring about the above conditions the capabilities of the four levers 22 are doubled. For example, should it be desired to send an audible signal or alarm or to stop the type wheel on its return at some intermediate point, which in this art is known as tabulating, the eighth lever, the shift magnet 57, and one of the levers 22 are operated. For the sake of clearness this alarm lever designated by A is shown in Fig. 5 as an independent device, but it will be understood that its contact may be on one of the levers 22. When this operation is performed battery is sent through the same course as in the above described examples until it reaches the magnet 57, from which it passes by wire 73 to and through the connected terminals 39 and 40, to and through the resistance 74, eighth lever 64 and thence to ground. In the drawing, Fig. 5, the entire possible number of circuits that may be thus operated by levers 22 is not shown, but from the illustration given the complete arrangement is at once obvious, as the other circuits are similar to those shown. In like manner, if the lever T be operated in connection with the shift magnet a magnet 76 will be energized and the carriage stopped at the desired point.

It will be observed that when those operations of the receiver are effected which do not require the operation of the printing magnet the circuits which effect such operations also include one of the coils 50 of the

magnet that operates the armature 70, and when such coil is energized the armature 70 is drawn down and the printing magnet is cut out of circuit. I would also call attention to a detail which is of considerable importance in this and similar machines. In devices of this character heretofore it has happened that some characters on the type wheel are not always properly inked, because the inking of characters involves a rotation of the type wheel over an ink roll. In the present machine it will be observed that the magnet 51 turns the type wheel until the pin barrel is engaged by the lever 11, and that before any letter is printed the wheel rotates a certain distance before it is stopped in what may be regarded as its first operative position, there being a space between the first pin and the lever 12 that stops the rotation at such point.

In this class of machine the character of the translator varies very widely, bars, pins, and other devices being used for the purpose. In my claims I have particularly referred to slides and levers, but it will be understood that in this respect the invention is not limited to the forms which the claims thus describe, but include any form of translator organized and adapted to perform the same functions. In other respects the invention is not limited to the specific devices shown and described in illustration of the improvement.

What I claim is:—

1. In a printing telegraph receiver, the combination of a series of permutation slides, and a selective magnet for each slide adapted, when energized, to move the same, a series of levers cooperating with the slides, a pin barrel adapted to turn to an extent determined by the levers and a type-wheel turning with the pin barrel.

2. In a printing telegraph receiver, the combination with means for turning the type wheel of permutation slides and magnets for shifting the same, a series of levers cooperating therewith, means movable to an extent determined by the levers and gearing between the same and the type wheel whereby the latter is raised to an extent dependent upon the movement of said means.

3. In a printing telegraph receiver, the combination with a series of permutation slides, of magnets for shifting the same and levers cooperating therewith, a pin barrel normally held against movement, a magnet for releasing the same and permitting it to turn until encountered by one of the levers.

4. In a printing telegraph receiver, the combination with means for raising and means for turning the type-wheel, of permutation slides, magnets for determining the extent of movement of the type-wheel in line with its axis and an electro-magnet for

releasing the means for turning and lifting the type-wheel.

5. In a printing telegraph receiver, the combination with means for turning the type wheel to bring alternate rows of characters to the printing position, comprising a pin barrel in gear with the type wheel, permutation slides and levers cooperating therewith and adapted to arrest the rotation of said barrel and means for bodily moving said levers to permit the pin barrel to turn through arcs longer by one character space than then normal.

6. In a printing telegraph receiver, the combination with means for turning the type wheel, of permutation slides and levers for determining the extent to which the wheel may turn, other permutation slides and levers for determining the extent to which the type wheel is raised, electromagnets for controlling both sets of slides and means for operating the type wheel according to the condition of the slides and levers.

7. In a printing telegraph receiver, the combination of a translator for determining the extent to which the type wheel may turn, a translator for determining the extent to which it is raised, electromagnets for operating the translators, devices for limiting the turning movement of the type wheel and shifting magnet for displacing said devices, whereby the type wheel is turned, on the operation of the said shifting magnet, a character space beyond that determined by the translator.

8. In a printing telegraph receiver, the combination with means for turning the type wheel, of permutation slides and magnets for shifting the same, of a series of levers cooperating therewith, a sliding bar movable to an extent determined by the levers, and gearing between the same and the type wheel, whereby the latter is raised to an extent dependent upon the movement of said bar.

9. In a printing telegraph receiver, the combination with means for turning the type wheel to bring alternate rows of characters to the printing division, said means comprising a movable element with variously placed stops, permutation slides, and levers cooperating therewith and adapted to arrest the movable element in different positions, and means for bodily moving the said levers to permit the movable element to move through distances of one character space beyond the normal.

10. In a printing telegraph receiver, the combination with a type-wheel, of means for rotating the same to bring characters into the printing position, the normal position of the said wheel requiring it to be rotated through one or more spaces, to bring it into the zero position or that from which any character can be printed.

11. In a printing telegraph receiver, having translators for turning and also for lifting the type wheel, the combination of a lever in one translator, a circuit controlled thereby, levers in the other translator also controlling said circuit, and means for operating the said lever in the first translator together with one of those in the other translator.

12. In a printing telegraph receiver having translators for turning and for lifting the type wheel and a shift magnet for advancing the type wheel from any position through one character space, of a lever in one translator, a circuit controlled thereby, levers in the other translator also controlling said circuit, and means for simultaneously operating the said lever in the first translator and one of those in the other translator and the shift magnet.

13. In a printing telegraph receiver, having independent translators for turning and for lifting the type wheel, the combination of a lever in the turning translator, a circuit controlled thereby, levers in the lifting translator also controlling the said circuit, and means for operating said lever in the turning translator and one of those in the lifting translator at the same time.

14. In a printing telegraph receiver having translators for turning and for lifting the type wheel, and a shift magnet for advancing the type wheel from any position

through one character space, of a lever in the turning translator, a circuit controlled thereby, levers in the lifting translator also controlling said circuit, and means for simultaneously operating the said lever in the turning translator, and one of those in the lifting translator and the shift magnet.

15. In a printing telegraph receiver, the combination with means for operating the type wheel, of a tabulating magnet and means for operating the same to effect a partial return of the type wheel carriage to its initial position.

16. In a printing telegraph receiver, the combination with a type-wheel capable of rotary and longitudinal movement, of two non-interfering mechanisms capable of simultaneous operation, the one for controlling the extent of rotation of the type-wheel, the other for lifting the same to bring any desired row of characters thereon into register with the printing portion, means for adjusting said mechanisms according to the character of the line impulses and means operated by a line impulse for operating both mechanisms at the same time, after their adjustment, as set forth.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

JOHN E. WRIGHT.

Witnesses:

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THOMAS J. BYRNE.