

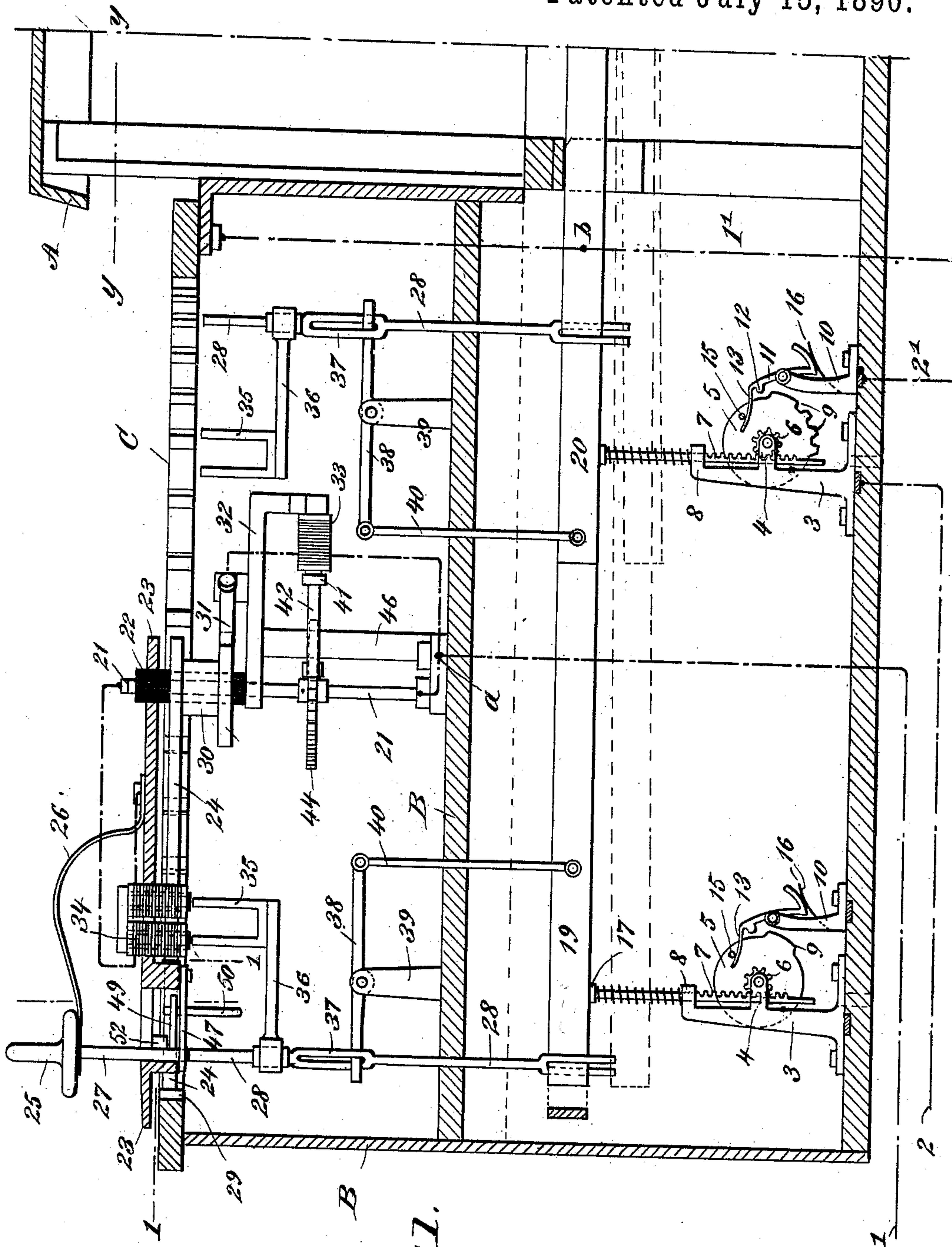
(No Model.)

4 Sheets—Sheet 1.

W. W. TAYLOR.  
PRINTING TELEGRAPH.

No. 432,453.

Patented July 15, 1890.



WITNESSES:  
*Donn Twitchell,*  
*W. Sedgwick*

*Fig. 1.*

INVENTOR:  
*W. W. Taylor*  
BY *Munn & Co*  
ATTORNEYS

(No Model.)

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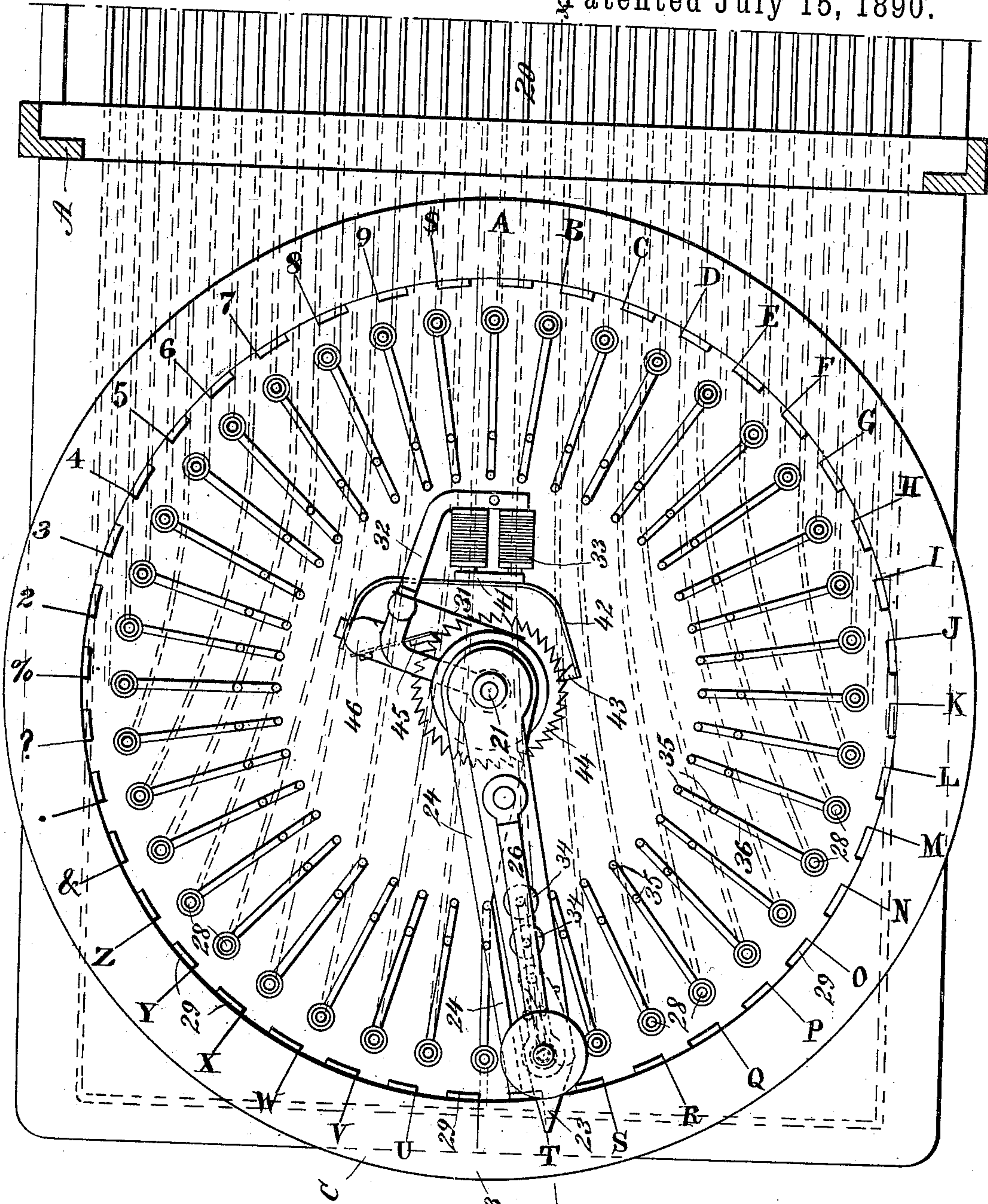


Fig. 2.

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Fig. 5.

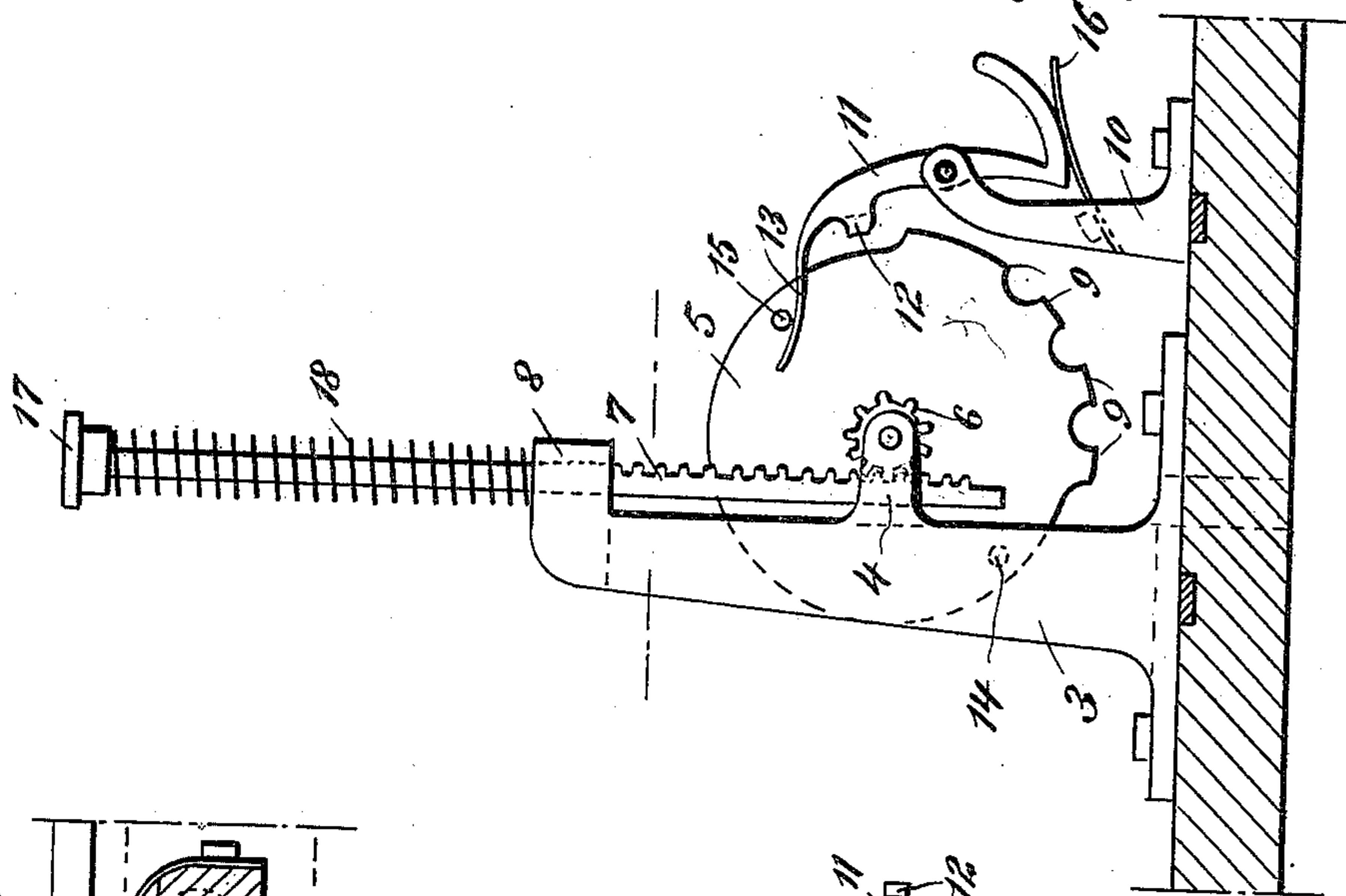


Fig. 3.

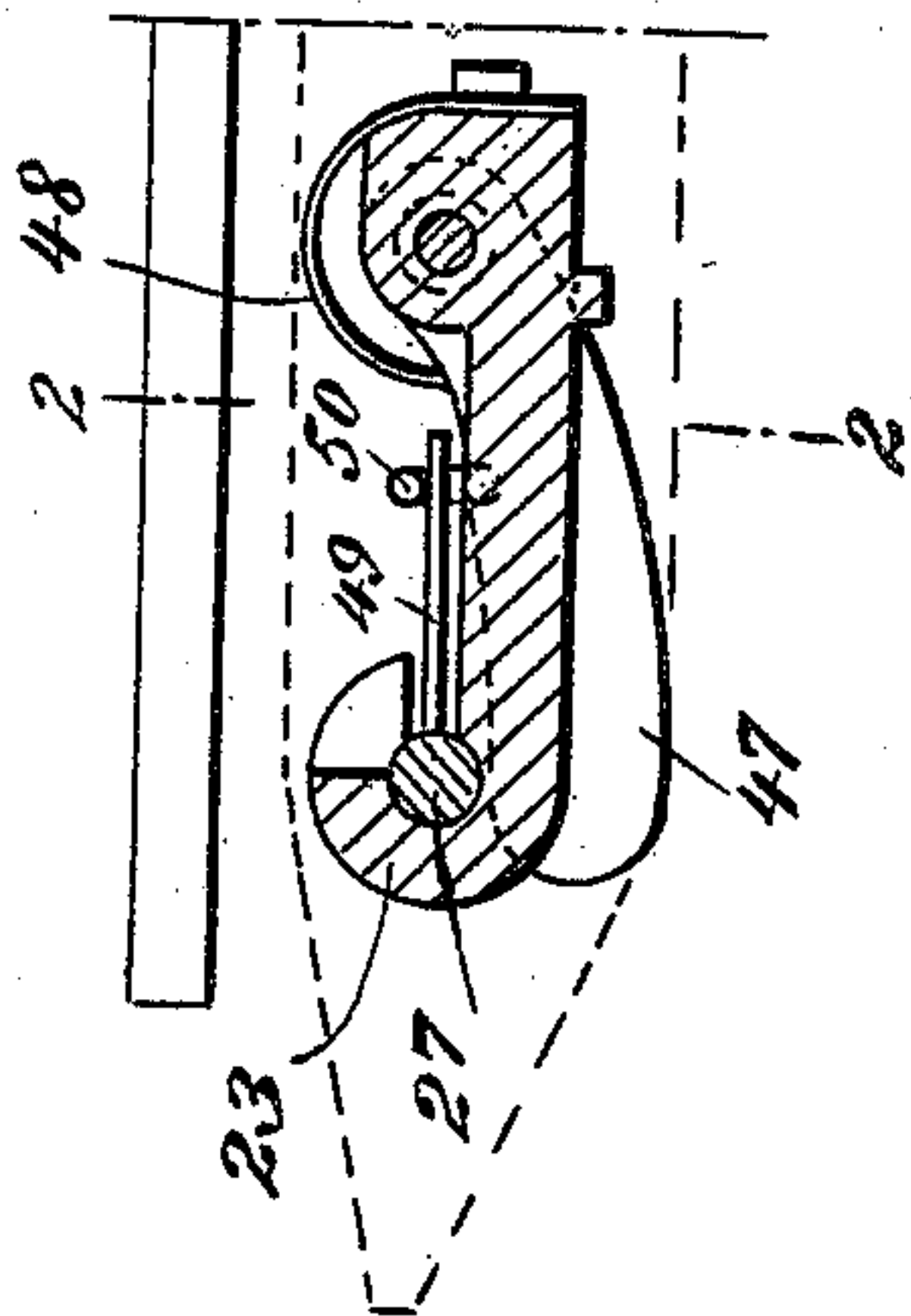


Fig. 6.

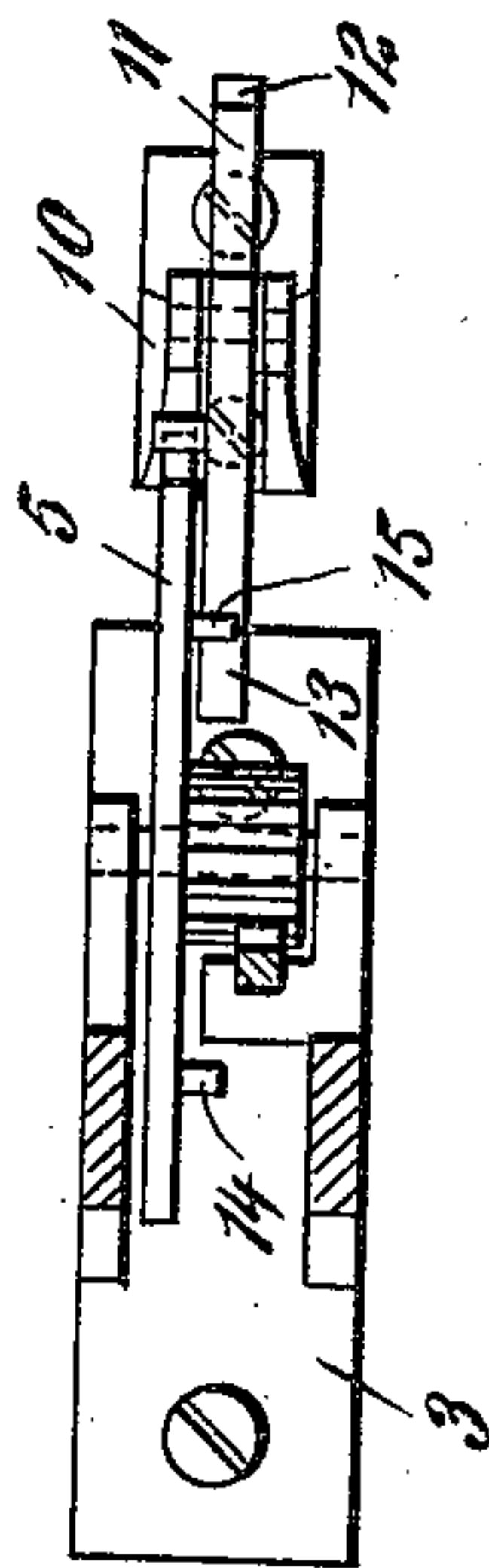
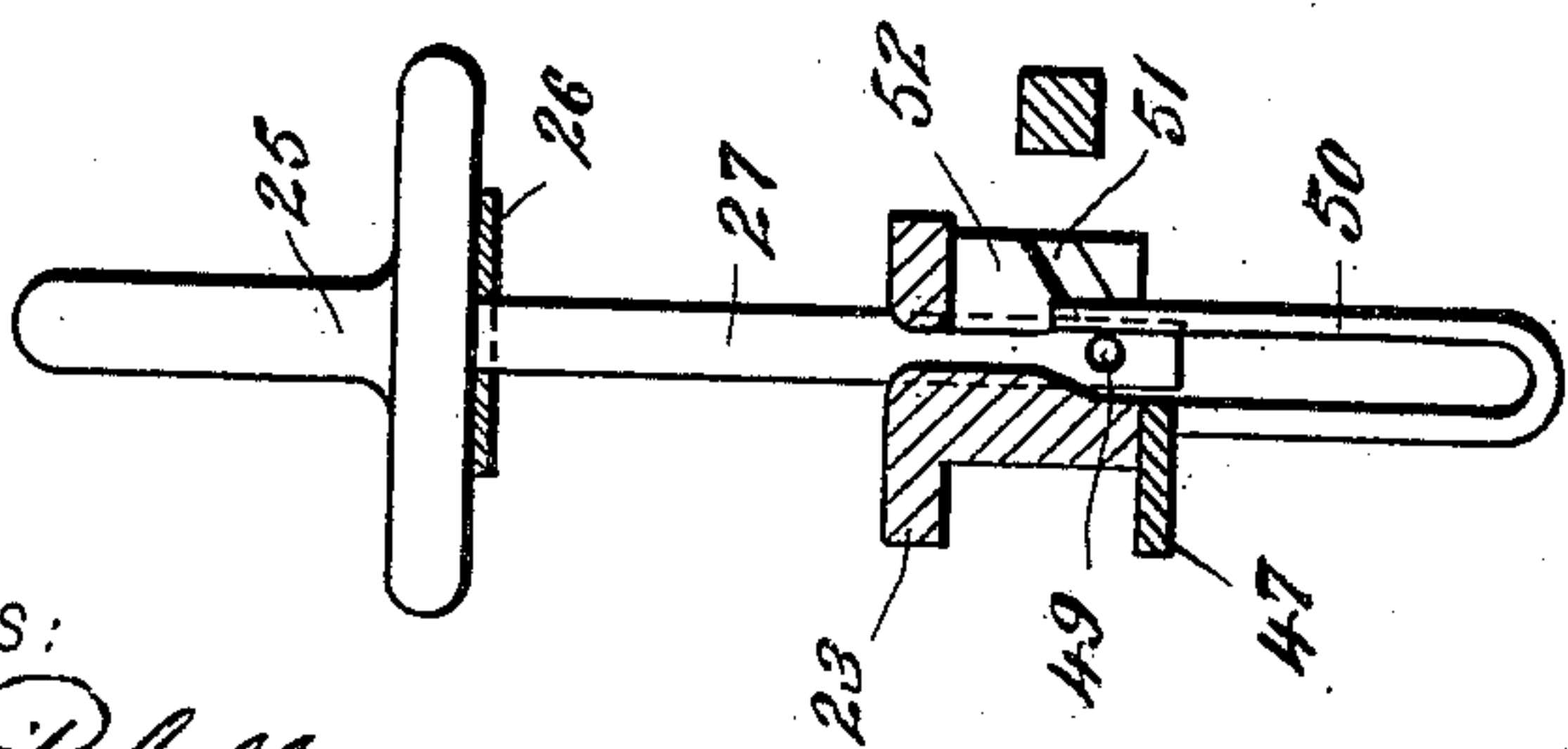


Fig. 4.



WITNESSES:

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INVENTOR:

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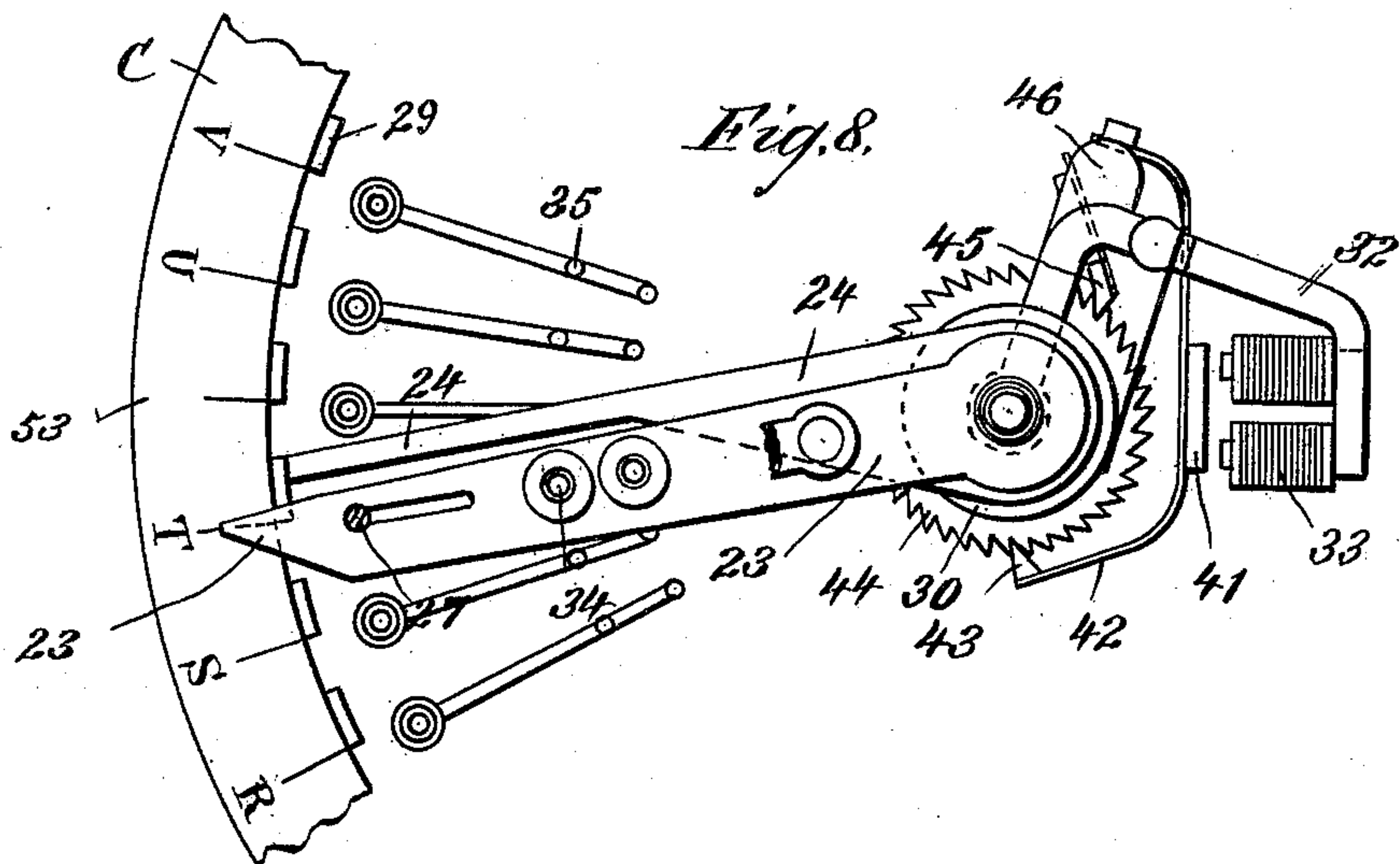
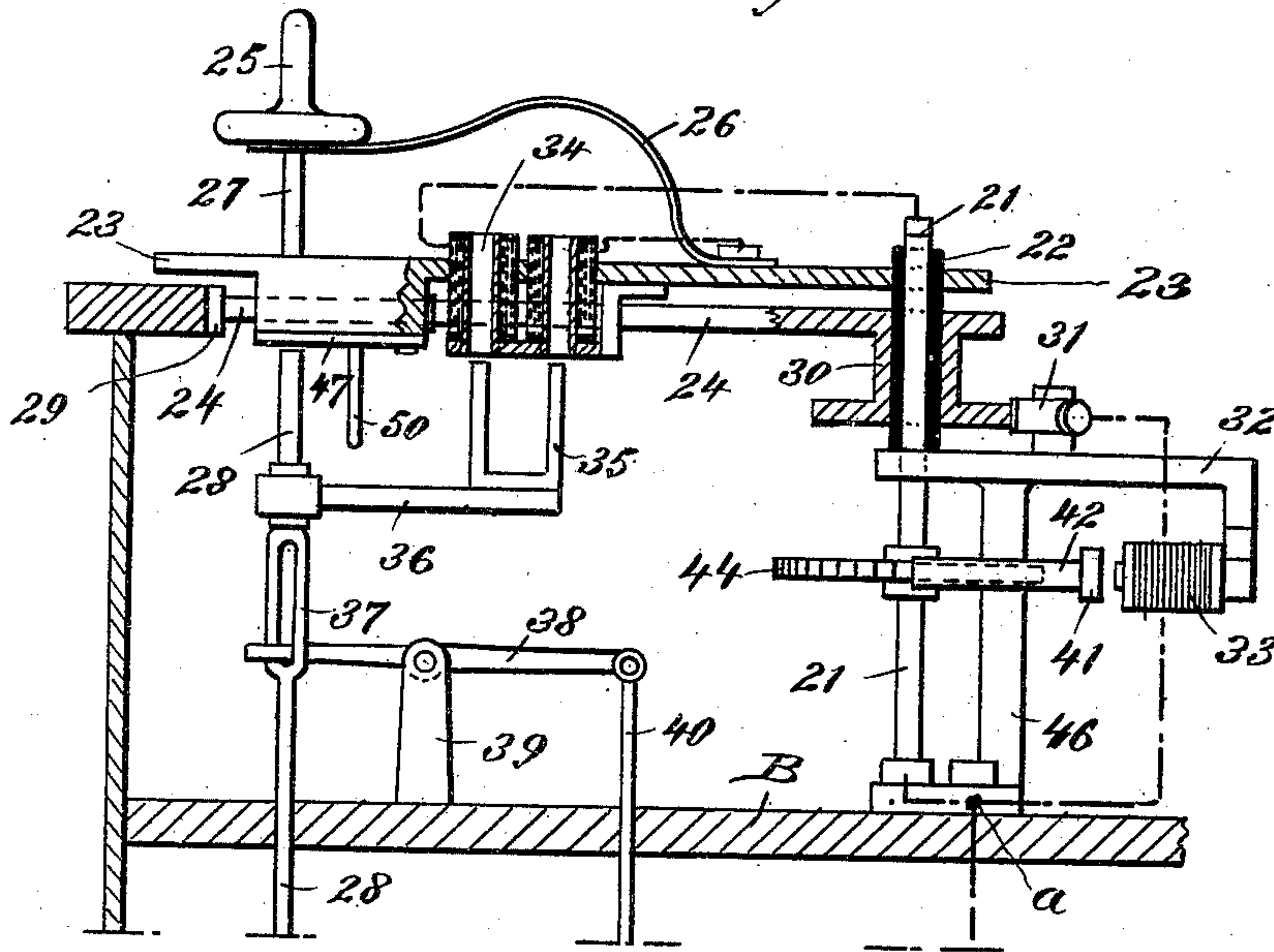
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*Fig. 7.*



WITNESSES:

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

WILLIAM W. TAYLOR, OF MANSFIELD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ELLEN MARIA LEAVENS, OF PROVIDENCE, RHODE ISLAND.

## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 432,453, dated July 15, 1890.

Application filed November 23, 1889. Serial No. 331,327. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. TAYLOR, of Mansfield, in the county of Bristol and State of Massachusetts, have invented a new and Improved Telegraph Type-Writing Apparatus, of which the following is a full, clear, and exact description.

My invention relates to improvements in printing-telegraphs; and the object of my invention is to provide an apparatus by which type-written messages may be sent by telegraph and recorded at both ends of the line by a person not familiar with telegraphy; also, in providing means for sending printed and dot-and-dash messages to different points over different lines at one operation, and also to so construct the apparatus that a single tap upon a key, as the key of a type-writer, will transmit a whole letter or character and record the same at both ends of the line.

To this end my invention consists in a collection of keys, like the keys of a type-writer, each key representing some letter or character, and so constructed that a single tap upon one of the keys will transmit the whole letter or character represented by the key in dots and dashes and in print, and in connecting the keys with a type-writer at each end of the line in such a manner that when the keys are operated the type-writers will be operated also.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical section of the device arranged to operate the type-levers of a type-writer and a dot-and-dash instrument. Fig. 2 is a plan of the same; Fig. 3, a section on the line 1 1 of Fig. 2, showing the manner in which the transmitting-key is raised and insulated from the operative parts of the device; Fig. 4, a vertical section of the same on the line 2 2 of Fig. 4; Fig. 5, an enlarged view of the device for sending dot-and-dash messages, and Fig. 6 a plan of the same. Fig. 7 is a detailed view, partly in section, of the dial-pointer and contact-arm, the magnets, armature and lever connections for operating the type-levers, and the mechanism for operating the dial-pointer and contact-arm;

and Fig. 8, a detailed broken plan showing the dial-pointer and contact-arm and the mechanism for operating said parts.

The frame of the apparatus B is mounted on the same plane and in line with the type-writer A, it being immediately behind the type-writer and connected therewith in a manner hereinafter described. The arrangement is the same at both ends of the line, the device acting both as a receiving and transmitting instrument.

In the drawings the printing device is shown in circuit with the line-wire 1, so that a printed message will be sent over it to one point, and the dot-and-dash device in circuit with another line-wire 2, which for use at a receiving-station would be connected up with an ordinary recording-instrument, but which at the transmitting-station could be connected with another line, so that a dot-and-dash message may be sent over it to another place at the same time and at one operation.

The printing device and the dot-and-dash device are connected by wires 1' and 2', respectively, to main batteries and ground-wires in the usual manner to complete the circuit, each device being connected with a separate battery. At the top of the device is a circular dial-plate C, having the desired letters, figures, and characters arranged around it, and beneath each character is a system of connection with the corresponding character of a type-writer and with a key representing the character in dots and dashes.

The dot-and-dash device proper consists of the following parts: a standard 3, having an extending arm 4, in which is pivoted a circular disk 5, having a gear-wheel 6 attached thereto, which meshes with the toothed rod 7, that moves vertically at the side of the disk 5 through bearings in the arms 4 and 8 of the upright 3. The edge of the disk 5 is provided with projections 9, of different lengths, which represent the character to be transmitted. Opposite the disk 5 is an upright 10, having an arm 11, with a projection 12 pivotally attached to the top thereof, said arm having its upper end provided with a projecting spring 13, which engages the studs 14 and 15 on the disk 5 and having its lower end bent and supported by a spring 16, attached to the upright



10. The top of the rod 7 is provided with a button 17, and coiled around the upper end of the rod, between the arm 8 of the upright 3 and the button 17, is a spiral spring 18, so that when the rod 7 is depressed the spring 18 will raise it again as soon as the pressure is removed. The disk 5 is connected with the line-wire 2 through the upright 3, and the arm 11 with the battery and ground-wire 2' through the upright 10. When the rod 7 is depressed, the gear on the rod, acting upon the gear 6, turns the disk 5 and brings the projections 9 of the disk successively in contact with the projection 12 of the arm 11, thus completing the circuit and sending pulsation over the wire that will correspond in length with the length of the projections 9 of the disk 5, as the circuit is only complete when these projections are in contact with the projection 12 of the arm 11, and as the projections 9 and the spaces between said projections vary in length to make dots and dashes representing a particular character the whole character will thus be transmitted by one tap upon the rod 7 and oscillation of the disk 5. When the disk 5 has turned sufficiently for the projections 9 to have passed the projection 12, the stud 14 upon the side of the disk will strike the spring 13 and tip back the arm 11, to which it is attached, so that when the disk is turned back by the action of the spiral spring 18, as described, the projections 9 will not strike the projection 12; but after the disk turns back till the projections 9 have all passed the projection 12 the other stud 15 will strike the top of the spring 13 and tip the arm 11 and projection 12 back into their original position ready for use.

The instrument is put in connection with the wire to be used by means of a switch in the usual manner. The rod 7 is connected at the top with the type-levers 19 20 of a type-writer, which connect with type bearing the characters represented by the dots and dashes made by the projections 9 of the disk 5, as above described, so that when the type-levers 19 20 are depressed to record and transmit the message, as hereinafter described, they will depress the rods 7 and also transmit and record the message in dots and dashes. In the center of the dial-plate C is a vertical spindle 21, which stands upon a cross-plate of the frame B and upon which is journaled an ivory sleeve 22, to which are attached the pointer 23 and contact-arm 24, arranged one above the other and insulated from each other and from the spindle 21 by the ivory sleeve 22. The pointer 23 indicates the letters to be transmitted, and is provided with a key 25, which is supported by a spring 26, which is attached to the pointer, and is provided with a depending spindle 27, which projects through the pointer 23 and passes by the contact-arm 24 for contact with the rod 28. The dial-plate C is connected with the ground-wire 1', and is provided with projections or contact-pieces 29, arranged nearly opposite

each letter of the dial-plate, so that when the pointer 23 is over a certain character the end of the contact-arm 24 will come in contact with the contact-piece 29 opposite the same character and complete the circuit, the current passing through the contact-arm 24, metal plate 30, which encircles the sleeve 22 and rests lightly against the under side of the contact-arm 24, flat spring 31, magnet 33, which is supported by the arm 32, attached to standard 46, and then over the line-wire 1 to the instrument at the other end of the line. The current from the line-wire 1 is shunted at the point a, a part of the current going through the magnet 33, spring 31, metal plate 30, contact-arm 24, and contact-piece 29 to the dial-plate C, and the other part passing through the spindle 21 to the magnet 34 and pointer 23, to which said magnet is fixed, and then through spring 26, spindle 27, rod 28, type-lever 19 or 20 to the point b in wire 1'. When the spindle 27 comes in contact with the rod 28, the circuit is complete throughout the device. We will now suppose the letter T is to be sent, as indicated by the pointers. The key 25 is depressed, thus forcing down the rod 28, which is forked at the end and straddles the T type-lever 19 of the type-writer, so that this, acting on the type-lever 19, will print the letter "T" on the transmitting end of the line, and will also depress the rod 7 of the dot-and-dash device and send the letter "T" in dots and dashes. The current will enter the instrument at the other or receiving end of the line over the line-wire 1 and will pass up the spindle 21 to the magnet 34, which, being attached to the pointer 23, will be over the T-key of a type-writer, as at this end of the line, as will be explained hereinafter, the current, acting through the magnet 34, will raise the armature 35, which is attached by an arm 36 to the rod 28, so that when the armature 35 is raised it will raise the rod 28 and loop 37 of said rod, thus tilting the walking-beam 38, which is pivoted to the upright 39, and one end of which enters the loop 37, forcing down the rod 40, one end of which is attached to the walking-beam 38 and the other to the T type-lever of a type-writer, and printing the letter "T" at that end of the line. The drums of the magnet 34 are made hollow to allow the armature 35 to project into the same, so as to give sufficient movement to the type-levers 19 20 to effect the printing. This action will also operate the dot-and-dash device, as heretofore described. Each type-lever of the type-writer is provided with the mechanism just described, which is arranged opposite the character on the dial-plate C represented by the type-lever to which the mechanism is attached.

The pointer 23 and contact-arm 24 are moved around the dial-plate C by taking hold of the key 25 and moving it to the desired letter or character. As the pointer and contact-arm are moved around, the end of the contact-arm 24 will touch the contact-pieces



29, arranged around the dial-plate opposite each letter or character. When the contact-arm 24 touches a contact-piece 29, the current will pass through the contact-arm, through the metal plate 30, spring 31, and magnet 33. The magnet 33, acting on the armature 41, which is attached to the spring 42, will draw said spring away from the ratchet-wheel 44, with which it engages by a pawl 43, attached to the one end of the spring. The armature 41 is just far enough from the magnet 33 so that when the armature is drawn against the magnet it will pull the pawl 43 back one tooth on the ratchet-wheel 44. A dog 45, attached to the standard 46, engages the teeth of the ratchet-wheel 44 and prevents the same from turning back. The spring 42 is also attached to the standard 46. The ratchet-wheel 44 is fast to the spindle 21, so that when the ratchet-wheel is turned the spindle will turn also, and as the notches or teeth on the ratchet-wheel represent the same arc of a circle as the space between the contact-points 29 when the ratchet-wheel is turned the distance of one tooth the pointers, being attached to the spindle 21, will move one space on the dial-plate. When the pointer 23 and contact-arm 24 are moved a little farther around the dial-plate C, the contact-arm 24 will be removed from contact with the contact-piece 29 and the current will be broken. Consequently the magnet 33 will release the armature 41, and the action of the spring 42 and pawl 43 will push the ratchet-wheel 44 around one notch or the width of a tooth. This action will be transmitted and duplicated at the other end of the line by the current acting on the parts described. Every time a character and contact-piece 29 is passed this action will be repeated, so that the pointers 23 24 on the other or receiving end of the line will indicate the same characters that they do at the transmitting end of the line, and the magnet 34 will always be above the proper armature 35, which actuates the key of a type-writer by means of the connecting parts already described. The dial-plate C is provided with a space 53, in which there is no character represented; but a contact-piece 29 is placed opposite the space. When connection is made and the key 25 depressed, the same action will take place on the spacer-keys of the type-writers at both ends of the lines as upon the letter-keys just described, and the required space made between the words. If necessary or desirable, additional spaces may be arranged upon the dial-plate and suitable connections made with the additional spaces and the spacer-keys of the type-writers. When the pointer 23 and contact-arm 24 are moved around the dial-plate C, if the spindle 27 was allowed to come in contact with the rod 28 the circuit would be completed and a character transmitted every time such contact was made, and as the contact would be made every time the pointer and contact-arm passed a character of the dial-plate and the spindle came above

one of the rods 28 the result would be very confusing. To prevent this an ivory insulating-plate 47 is pivotally attached to the under side of the pointer 23, so that it may be swung under the spindle 27 and prevent it from coming in contact with the rod 28. The plate 47 is actuated by a spring 48, attached to the pointer 23 near the plate 47, which has a tendency to throw the plate from under the spindle 27 and allow the spindle to be pressed upon the rod 28; but the spindle 27 is provided with a lever 49, which strikes a stud 50 on the plate 47, so that when the spindle is turned to the left by means of the key 25 the lever 49, acting on the stud 50, will hold the plate 47 beneath the spindle 27, and so keep the spindle insulated from the rod 28. In turning the spindle 27 to the left the lever 49 enters an inclined slot 51 in the sleeve 52 of the spindle, so that the spindle is raised and insulated from the rod 28 at the same time. In moving the pointer 23 and contact-arm 24 the key should be turned to the left and held in that position until a character is reached that is to be transmitted, when the fingers are released from the key 25, and the spring 48 will throw the plate 47 from under the spindle 27 and allow the same to drop into contact with the rod 28.

The stud 50, that is attached to the plate 47, is made U-shaped, as shown in Fig. 5, so as to admit of the spindle 27 being depressed, the lever 49, attached to said spindle, moving freely between the sides of the stud when said spindle is depressed. If the message sent is to be recorded at both ends of the line, it will be necessary to depress the key 25 sufficiently to operate rod 28 and the type-levers 19 and 20 of the type-writer at the transmitting end of the line every time a character is transmitted; but if the message is only to be recorded at the receiving end of the line it will only be necessary to bring the spindle 27 in contact with the rod 28, thus completing the circuit and causing the magnet 34, armature 35, arm 36, loop 37, walking-beam 38, and rod 40 to actuate the type-levers 19 20 of the type-writer at the receiving end, as already described.

The printing and dot-and-dash apparatus may be used together or separately. The dot-and-dash messages may be recorded on a tape in the usual well-known manner; but it will be necessary to speed the tape higher than in the ordinary telegraph, as the messages will be transmitted much faster.

The dial-plate C may be provided with short words—such as “to,” “at,” “in,” “of,” &c.—and corresponding words represented by the type of the type-writer, thereby greatly increasing the speed of the apparatus. Messages may also be sent in stenographic signs or in cipher by making the necessary changes in the dial-plate and in the type of the type-writer.

I have shown mechanism for suitably spacing the letters and words at each end of the line, and when a line is printed across the



paper in the type-writer the operator will turn the drum of the type-writer up one line and slide the carriage across the machine in the usual manner and it will then be ready  
5 to receive another line.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the type-levers of  
10 a type-writer, a second set of type-levers, and dial-plates connected with the type-writers and provided with contact-points, of a contact-arm for each dial, provided with a contact-point, a pointer fixed to the same spindle  
15 above said contact-arm, a key carried by the pointer, electrically-operated means for shifting the contact-arm and pointer of the receiving apparatus, electrically-operated devices for depressing the type-levers of the same, and  
20 electrical connections, substantially as described.

2. The combination, with a type-writer type-lever, of a disk provided with spaced projections, a spring-actuated lever provided with  
25 a projection, a pinion connected with the disk, a toothed rod extending in the path of the type-lever, and means for shifting the lever projection into and out of contact with the disk projections, substantially as shown  
30 and described.

3. The combination, with the type-levers of a type-writer, a disk provided with contact-points, a central spindle, a contact-arm insulated from the spindle and provided with a  
35 contact-point, an indicating-pointer attached to the spindle above said contact-arm, and a key carried by the pointer, of a rod 28, adapted to be operated by the pointer-key and connected with a type-writer lever and with a  
40 lever which is also connected with a type-writer lever, an armature carried by the rod 28, a magnet carried by the pointer and arranged in a shunt-circuit, and electrical connections, substantially as described.

4. The combination, with the type-levers of  
45 a type-writer, a disk provided with contact-points, a central spindle, and a contact-arm carried by the spindle and insulated therefrom, said pointer being provided with a contact-point, of a ratchet-wheel on the spindle, an  
50 electro-magnet, an armature provided with a pawl adapted to engage the ratchet-wheel, and electrical connections, substantially as shown and described.

5. In a telegraphic type-writing apparatus, 55 the combination, with the type-levers of a type-writer, of the gear-rod 7, mounted in the stand-ard 4, the gear 6 and disk 5, connected therewith, said disk being provided with projec-  
60 tions 9 and studs 14 15, the arm 11, having projection 12 and spring 13, and the upright 10, said parts being electrically connected and adapted to transmit in dots and dashes the character represented by the type-writer  
65 type-levers to which they are attached.

6. The combination, with the type-lever of a type-writer, of a dial-plate having characters thereon corresponding with the characters of the type-writer, a pointer to indicate  
70 the character to be printed, a key provided with a spindle mounted in said pointer, and a rod connecting with said key-spindle and with the type-lever of the type-writer, so that  
75 by depressing said key and spindle the type-writer type-lever will be actuated and the indicated character printed on the type-writer, substantially as described.

7. The combination, with the pointer 23, journaled to the sleeve 22 and provided with  
80 magnet 34 and key 25, having spindle 27 and supporting-spring 26, of the dial-plate C, having contact-pieces 29, contact-arm 24, metal plate 30, spring 31, magnet 33, armature 41, spring 42, pawl 43, and ratchet-wheel 44, jour-  
85 naled to the spindle 21, the parts being connected to the line-wire 1 by shunt-circuits and to the ground-wire 1' by the contact-piece 29 and dial-plate C, substantially as described.

8. The combination, with the pointer 23, key 25, spindle 27, and magnet 34, of the ar-  
90 mature 35, rod 28, loop 37, walking-beam 38, upright 39, rod 40, and type-writer type-levers 19 20, said parts being connected with an electric current, substantially as described.

9. The combination, with the pointer 23, of  
95 a spring-actuated ivory plate 47, adapted to open and close the circuit between the spindle 27 and rod 28, substantially as described.

10. The combination, with the pointer 23, key 25, spindle 27, and lever 49, of the plate  
100 47, stud 50, slot 51, and sleeve 52, substantially as described.

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Witnesses:

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