

No. 614,492.

Patented Nov. 22, 1898.

E. McHUGH.

WORD REGISTER FOR TYPE WRITING MACHINES.

(Application filed Jan. 22, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

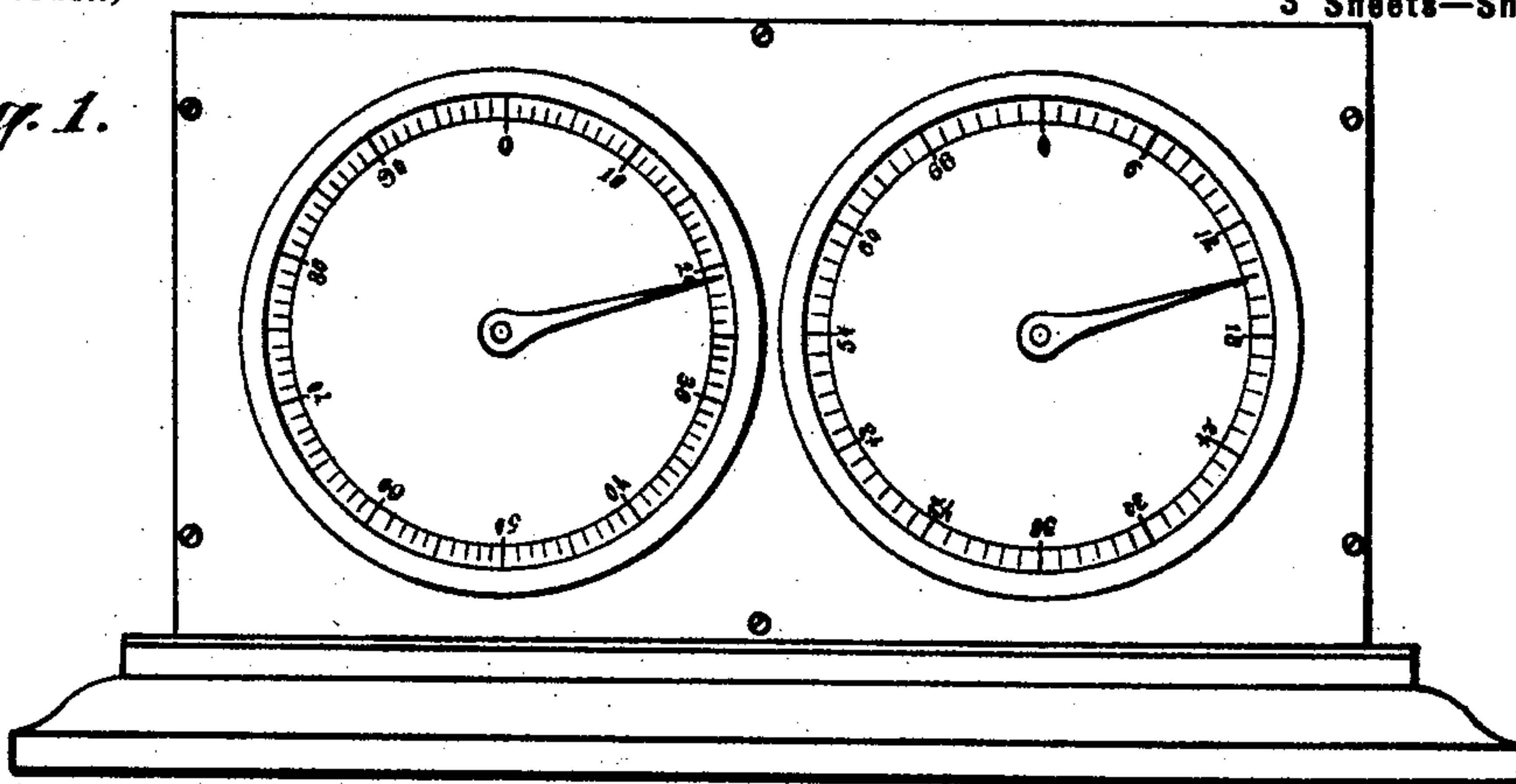


Fig. 2.

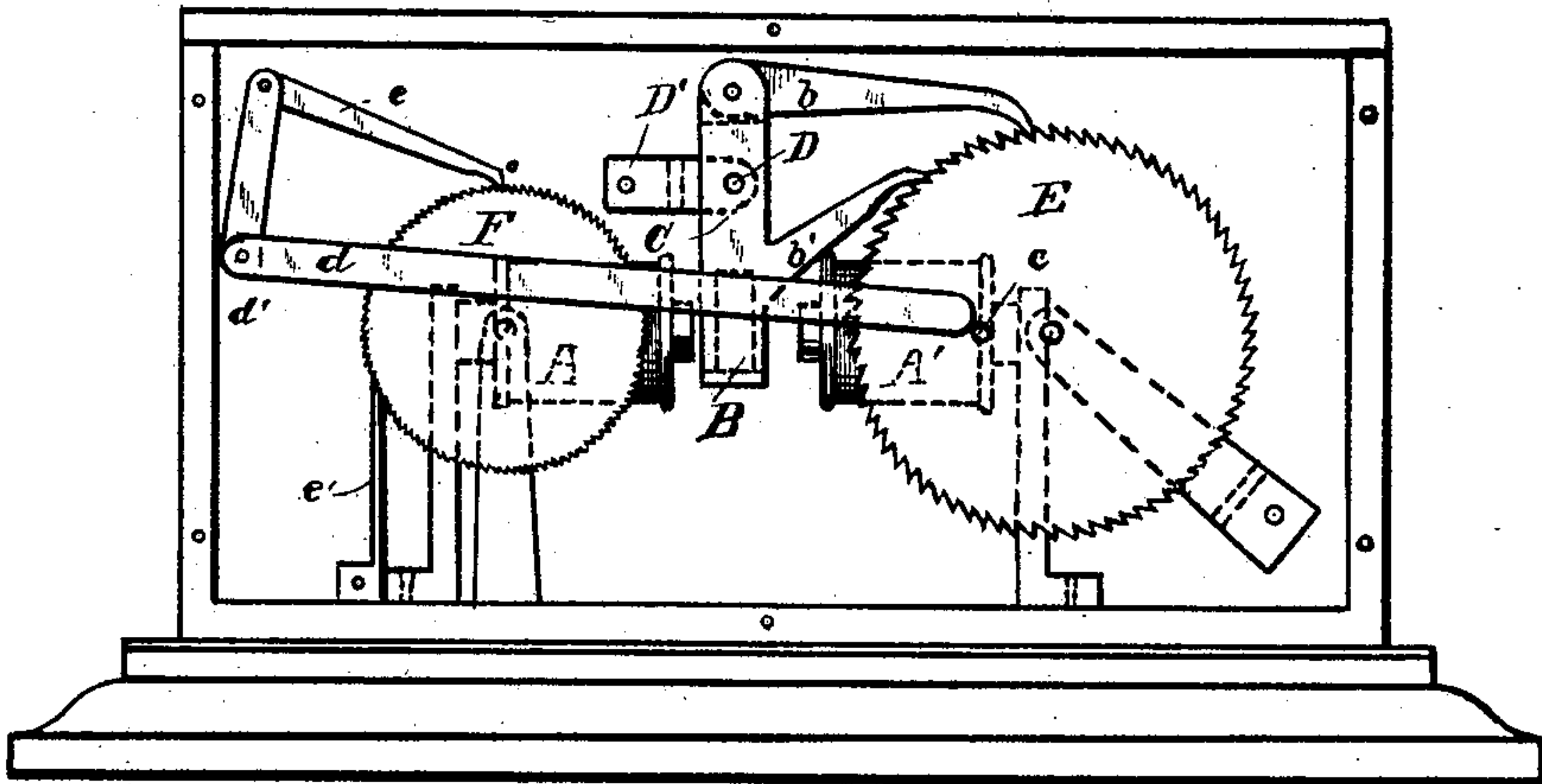
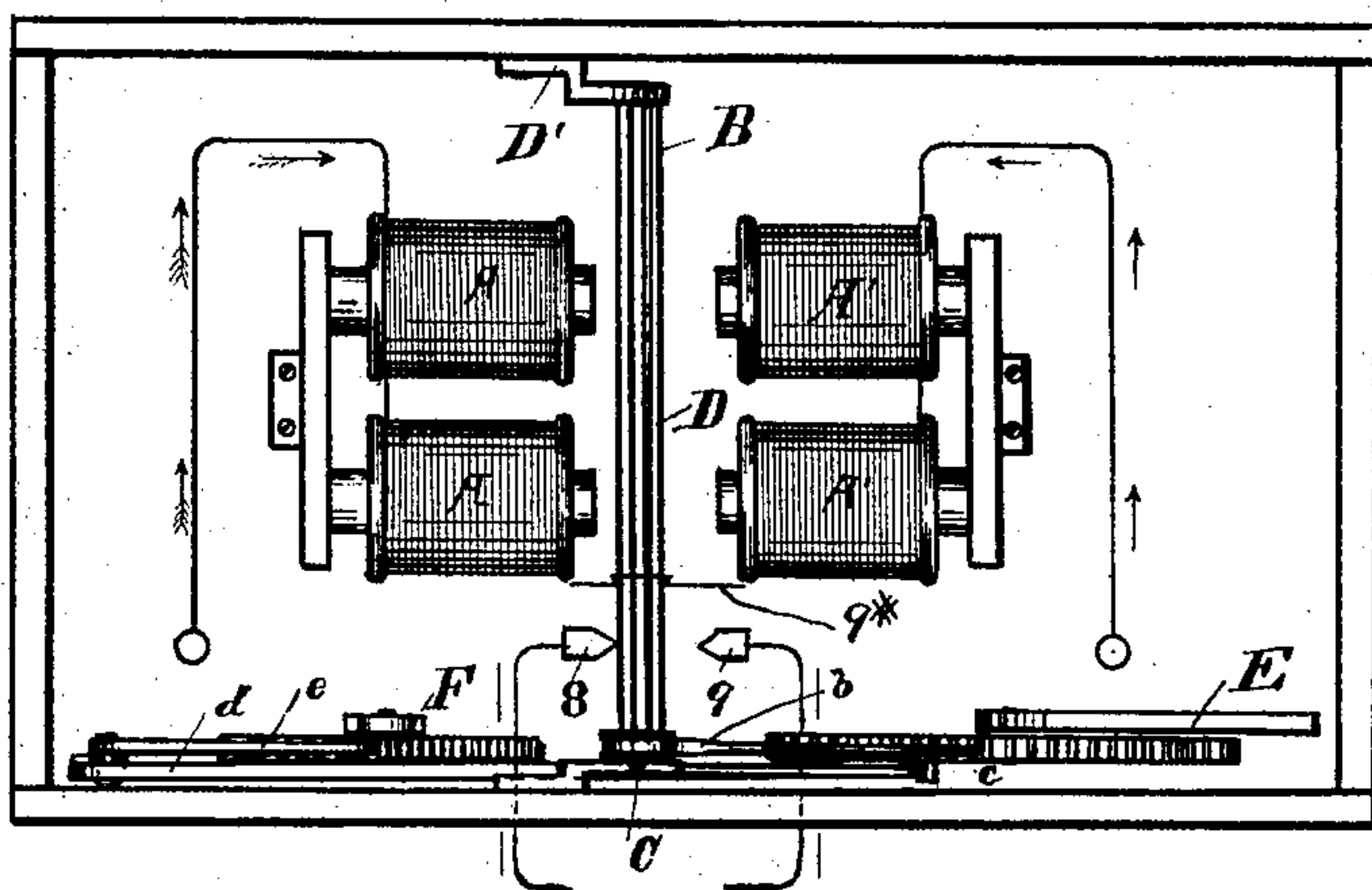


Fig. 3.



Witnesses

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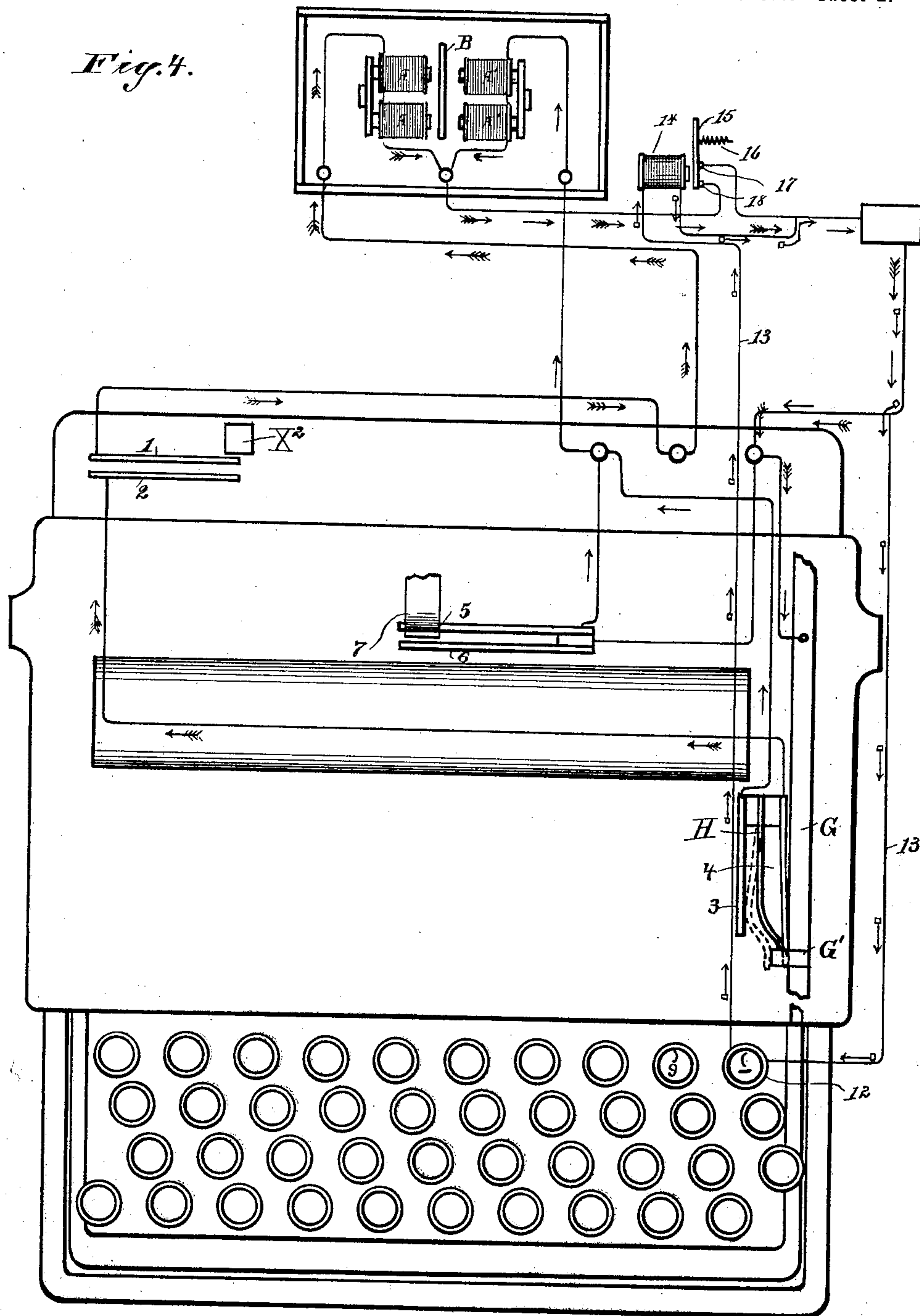
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3 Sheets—Sheet 2.



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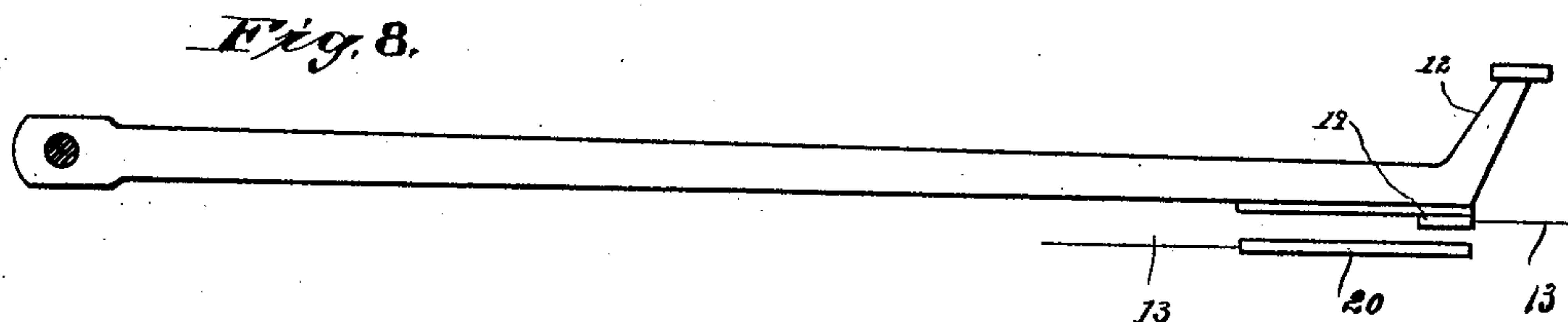
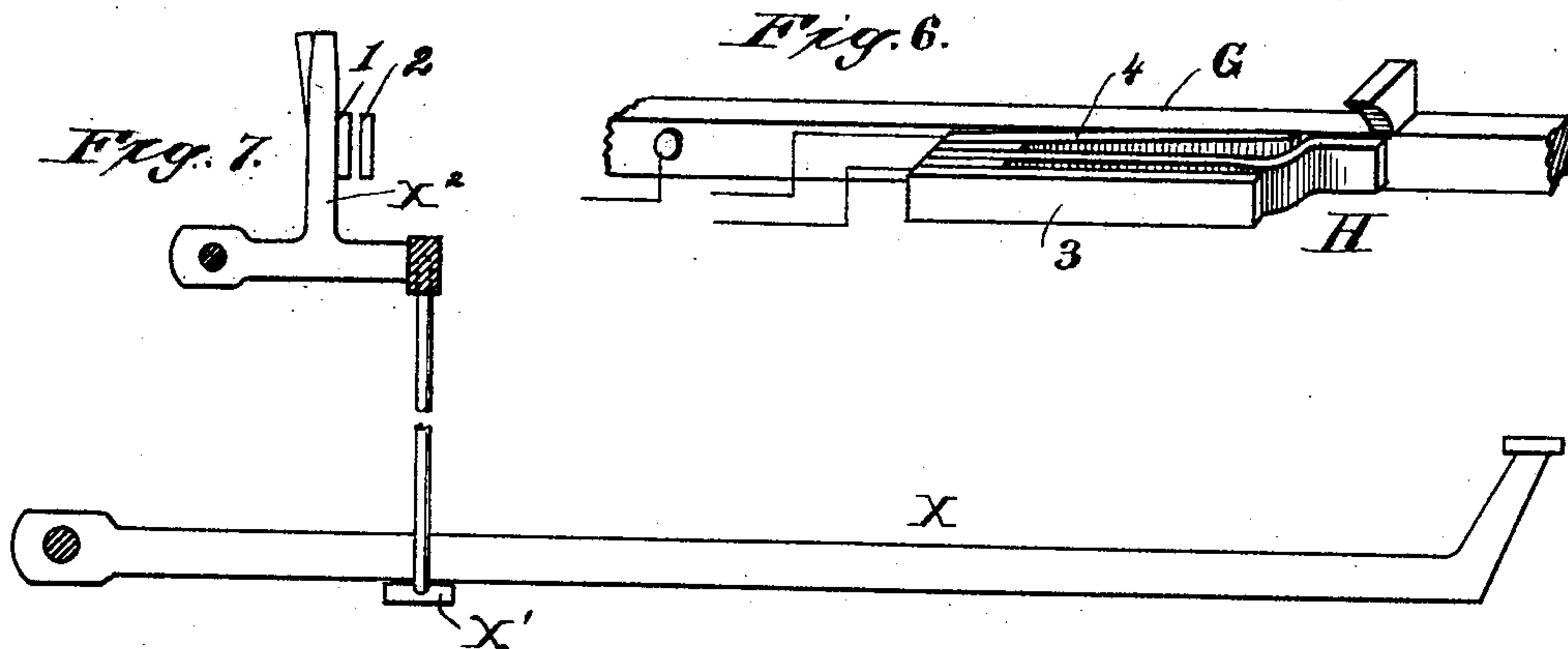
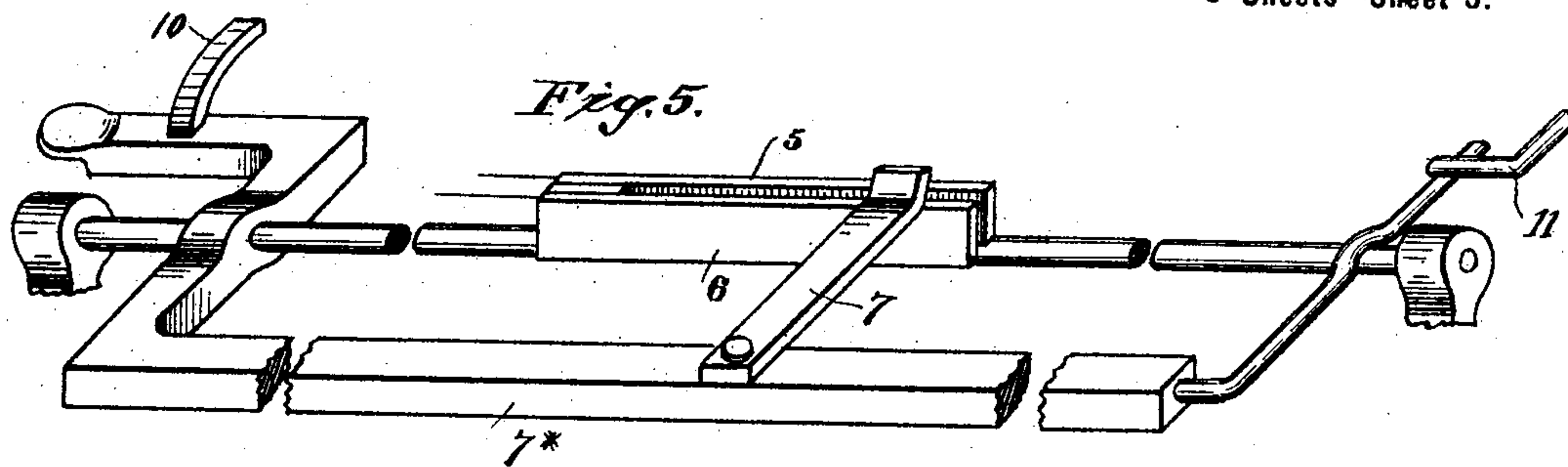
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3 Sheets—Sheet 3.



WITNESSES:

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WORD-REGISTER FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 614,492, dated November 22, 1898.

Application filed January 22, 1898. Serial No. 667,640. (No model.)

To all whom it may concern:

Be it known that I, EDWARD MCHUGH, a subject of the Queen of Great Britain and Ireland, and a resident of Dublin, Ireland, have invented a certain new and useful Word-Register for Type-Writing Machines, (for which I have obtained provisional protection in the United Kingdom of Great Britain and Ireland, dated July 6, 1897, and numbered 16,018;) and I do hereby declare the following to be a specification thereof.

The invention has reference to new improved means for automatically counting the words typed by type-writing machines in a convenient, accurate, economical, and efficient manner. The counting of words typed by these useful machines is obviously desirable in the ordinary course of commercial work, especially in legal work, where accuracy is necessary in estimating the number of folios contained in briefs, conveyances, leases, and such like documents. Hitherto various attempts have been made to attain this end by mechanical contrivances of various kinds. Some of these formed an integral part of the type-writer, while others consisted of detached apparatus coupled to the type-writer by various mechanical means. All such attempts, however, have failed in practice, owing to the difficulties of communicating the movement of a vast group of parts (such as go to make up a type-writer) by mechanical means to a counting device. Such methods were also found expensive and inaccurate and calculated to interfere with the ordinary working of the machine, and the detached devices were found to be unsuitable for use in combination with the various styles of machines in the market.

My invention does not attempt to attain the object in view by mechanical means alone, but proposes the application of electricity, which will be found, as hereinafter described, to be especially and peculiarly adapted as an unfailing means for communicating between a type-writing machine of any of the well-known kinds and a counting device of any suitable design.

The various movable parts of a type-writer are naturally adapted to the work of automatically making electrical contacts, and the advantage of a method of counting in which

electricity is utilized will be strikingly demonstrated by my invention.

In carrying out my invention only a few spring-contacts are introduced into the machine, and these are conveniently located, so as to be out of the way and in no manner interfere with the mechanism of the machine.

My invention may also be readily used in connection with different styles of machines, such as the Remington, the Yost, Densmore, and such like.

With the aid of the accompanying drawings I will explain the principle and action of my invention.

Figure 1 is a front view of the counting device, which I choose for descriptive purposes merely, since it is obvious that any convenient electrical counting device may be used with equal advantage and results. Fig. 2 is a view of Fig 1 with the dial-plate removed to show the mechanism. Fig. 3 is a diagram illustrating an automatic switch arrangement for avoiding the waste of the battery. Fig. 4 is a diagram showing in plan a skeleton type-writer and the counting device with electrical connections, as hereinafter more fully set forth. Fig. 5 is a perspective view, on an enlarged scale, of certain familiar parts in a Remington type-writer and illustrating the operation of the provision for controlling the space-circuit from the carriage-spacing lever and the line-space lever. Fig. 6 is another perspective view, on a similar scale, illustrating the provision by which the side bar operated by the space-key breaks the type-circuit and establishes the space-circuit. Fig. 7 is a longitudinal sectional view showing one key-lever, the rocking lever which controls the escapement mechanism, and its relation to the circuit-closing springs of the type-circuit. Fig. 8 is a detached view illustrating the arrangement of the circuit-closing springs and hyphen-key for closing the supplemental circuit to interrupt the type and space circuits.

Similar letters and numerals of reference indicate corresponding parts in all the figures where they appear.

A and A' are two electromagnets of soft iron.

B is an ordinary soft-iron armature attached at right angles to the oscillating lever C, the

armature being pivoted at D between a bracket D' on a fixed portion of the counter and the dial-plate. This armature actuates the ratchet-wheel E by means of two pawls *b b'*, whereby each oscillation of the armature drives the wheel one tooth—that is to say, when the armature is attracted to magnet A pawl *b* engages, and when it is attracted to magnet A' pawl *b'* engages. At each revolution of the ratchet-wheel E a stud *c* on the face of the same comes in contact with the crank-lever *d*, pivoted at *d'* and carrying a freely-pivoted pawl *e*, the said lever being raised by the stud and actuating the pawl *e* drives the wheel F forward one tooth, thus recording a unit. A spring *e'* holds the wheel F while pawl *e* recedes over its teeth.

The mechanism thus far described presents a simple electrical contrivance adapted to indicate the number of movements of the armature, and as the wheel E is provided with one hundred and forty-four teeth it is obvious that seventy-two complete oscillations will cause one revolution, which in turn will move the wheel E one tooth, thus indicating one folio of seventy-two words. By a "complete oscillation" is meant the positive pull of the armature to the magnet A and thereby a similar pull in the direction of the magnet A'.

The circuit connections between the counting device and the type-writing machine will be best understood in connection with Fig. 4.

In all or nearly all type-writing machines the movable keys and levers operate a universal part, and advantage is taken of this principle to establish the electrical connection necessary for the purposes of my invention. Of course there are certain contingencies peculiar to all type-writers which must be especially provided for and which will be referred to farther on.

For the purpose of illustration I will assume my invention to be worked in connection with a "Remington" machine, although with but slight modification it will be found equally suitable and applicable to all type-writers.

In the Remington all the letter-keys and also the space-bar operate one universal part, and this part in turn operates other mechanism for the work of the machine.

I find the most convenient part with which to make the principal electrical contact is that known as the "rocking lever," which controls the carriage-escapement mechanism. Fig. 7, which shows one key-lever X and the transverse suspended bar X' connected to the pivoted rocking lever X², illustrates generally how all the key-levers vibrate the rocking lever, since they all extend across the bar X' and parallel with the lever X, as in the Remington machine.

On the frame of the machine, in close proximity to the rocking lever X², are a pair of insulated contact-springs 1 and 2, one of which is connected by wire with the counting device direct and forming a partial circuit

through the coils of the magnet A to the battery, the balance of the incomplete circuit being formed by a wire leading from the battery to the metal side bar G, controlled by the space-bar, thence to the contact-spring 4, and finally connecting with the spring 2. Thus when the oscillating lever X² presses the spring 1 in contact with spring 2 a circuit will be completed through the magnet A, as indicated by the barbed arrows. This circuit I term the "type-circuit" and the magnet in its path the "type-magnet."

From the description thus far it will be obvious that on striking the proper key for the first letter of a word the type-circuit will be closed to cause the type-magnet A to attract the armature B and move the ratchet-wheel E by means of the pawl *b*. In the printing of a word the type-circuit is made and broken each time a letter-key is depressed. The movement of the keys succeeding that of the initial letter is not indicated on the dial, since the armature B is held in a position wherein it is not capable of acting on the ratchet-wheel, the attraction for each letter being in the same direction. Immediately, however, the armature is attracted to the opposite magnet A' the pawl *b'* engages and drives the ratchet-wheel forward one tooth.

The second magnet A', which I designate the "space-magnet," is included in the incomplete circuit indicated by the unbarbed arrows and is controlled by the space-bar and also by the line-space lever and the carriage-release lever. Inasmuch as the space-bar also operates the rocking lever X² provision must be made for breaking the type-circuit when the space-bar is operated. For this purpose spring-contacts 3 and 4, insulated with respect to each other, are introduced into the space-circuit. The natural tendency of the spring-contact 4 is to occupy a position out of contact with a part G, connected to and caused to descend whenever the space-bar is depressed. As shown, the part G will correspond with one of the side bars of the frame in a Remington machine which is depressed by the space-bar.

The spring 4 will be normally held in contact with the side of the bar G by a spring-tongue H, held in an insulating-fastening. The free portion of this tongue H is bent to normally hold the contact 4 against the side of the bar G, thus representing the position of the parts when the space-key is at rest; but upon the depression of the latter the bar G will descend and an inclined lug G' thereon will force the tongue H against the spring 3, and thereby liberate the spring 4 to break its contact with the space-bar, interrupt the type-circuit, and establish the space-circuit, whereby the space-magnet A' is energized and the armature attracted thereto. Thus when the space-bar is depressed no current will pass through the coils of the type-magnet A, notwithstanding the fact that the space-bar actuates the rocking lever X².

It may be here mentioned that in the "Yost" machine there is a special moving part for the letter-keys alone, so that the electrical connection between the counting device and this type of machine is simplified, as it is not necessary to provide for breaking the type-circuit when the space-bar is struck.

So far as the letter-keys and space-key are concerned the electrical connections are now complete, and it will be perceived that the work of counting is extremely simple. Provision must, however, be made for the movements of the "platen-carriage," whereby spacing is sometimes effected, and also for the usual operation of spacing between the lines with the "line-space" lever. This is accomplished by arranging for the inclusion of these movements in the space-circuit, which is effected by fixing spring-contacts 5 and 6 on the carriage-bar, which are acted upon by an arm 7, attached to the carriage-rack 7', whereby the operation of the line-space lever 10 or "carriage-release" 11, acting on the carriage-rack, will press these springs together and complete the space-circuit. Thus whenever the "space-key," the line-spaces, or the carriage-release is used the same effect is produced—that is, the space-circuit is actuated and the armature attracted to the magnet A'. It is clear, therefore, that whenever the operator completes a word he must produce, first, either an ordinary short space or, second, a long space or, third, a space between the lines, and any of these operations will result in causing the armature to approach the space-magnet and act on the ratchet-wheel E and thus record the typing of a word. A little consideration will now show that the armature will oscillate once to and fro for every word typed no matter how many letters there are in the word or how many spacing movements there are between words. It will also be clear that it will oscillate no oftener than there are words typed no matter how complicated the work is, with one exception—namely, when a broken word comes at the end of a line. It will be obvious that if the operator breaks a word at the end of a line and continues it on the next the armature will oscillate once for each bit of the broken word, there being a magnetization of the space-magnet in going from line to line.

Should it be inconvenient to avoid breaking words at the end of the line, advantage may be taken of the fact that when a word is broken at the end of a line the last thing typed is a hyphen. The hyphen-key 12 therefore may be made to close a circuit 13, connected with a special magnet 14, whose function when energized is to attract an armature 15, normally held by a spring 16 in contact with circuit-terminals 17 and 18. The armature therefore normally closes the space-circuit at this point, and when moved by the magnet destroys the capacity of said circuit for being completed. The wires of the circuit 13 are connected to spring-contacts 19 20

below the hyphen-key and adapted to be pressed together when said key is depressed. By such an arrangement the movement made in going from line to line will be ineffectual to close the space-circuit when a motion of the hyphen-key immediately precedes. The armature, however, whose motion toward the hyphen-key magnet destroyed the space-circuit is made to resume its position, and thereby to restore the space-circuit by another magnet whose circuit is closed by exactly the same motions as those closing the type-circuit. Thus it will be seen that the space-circuit will be ready for use after every line the last word of which is a completed word, but it will be, as it were, out of gear or broken when the last thing done on the line has been the using of a hyphen.

In the typing of words it will be observed that the type-magnet is magnetized several times successively for each letter contained in each respective word. Now the magnetization for the first letter is all that is required for the purpose of the invention, so that the effect of typing the subsequent letters of the same word simply wastes the battery. Similarly if there are several spacing movements between the words there is a corresponding waste of the battery. To prevent this waste of energy, I propose to make the armature of the counting device act as an automatic switch in a manner illustrated by diagram Fig. 3. Here two contact-studs 8 and 9 are introduced, the one to the left being in the type-circuit and the one to the right being in the space-circuit. The coils of the magnets A and A' connect electrically with the armature B through wire 9'. As shown in the diagram, the armature is attracted to the type-magnet A and is in contact with stud 8, in which position the circuit of this magnet is broken, but immediately the space-circuit is actuated the space-magnet A' attracts the armature, which, making circuit with the stud 9, breaks the space-circuit. Thus it will be seen that it is only the typing of the first letter of a word or the first of a series of spacing movements, such as sometimes occurs between two words, as in paragraphing, that will affect either magnet. This action will be readily understood and needs no elaboration. It is merely intended to economize the battery and has nothing to do with the operation of word-counting.

In the working of my invention it will be observed that every letter-key makes a contact for the type-magnet. This does not matter in the case of stops, brackets, and such like, because they are always typed in immediate connection with words; but in the case of the underscore-key it might happen that an underscore might be counted as a word. Any such difficulty, however, may be avoided by utilizing a short circuit—i.e., making any such key close a short circuit for the battery—and then throwing the registering mechanism temporarily out of operation.

I recommend that the use of the underscore be avoided altogether when using my invention or some allowance made therefor. Another point is with regard to the hyphen-key.

5 On the Remington and other high-class machines the hyphen-key also types some other character. If such character ended a line, it might prevent a word being counted by operating the hyphen-key-correcting device. Ar-
10 rangements may be made to avoid this difficulty. As an illustration the hyphen may be combined on the same type with a character which never can occur at the end of a line—for instance, the first bracket of a parenthe-
15 sis—as indicated in Fig. 4. These minor points, however, must be considered in connection with the work the counting device is to perform.

Having now particularly described the nature of my said invention, I would have it understood that I do not confine myself to the special method whereby the electrical connections are established between a type-writer and a counting device as herein described, as
25 these may be altered or modified to suit different types of machines; neither do I confine myself to the particular construction of counting device herein described, as any suitable electrical counting contrivance may be
30 used.

The device herein shown is somewhat crude in construction, being designed for simplicity and to facilitate the description of my invention.

35 I claim as my invention—

1. In combination with a type-writer, a registering mechanism, circuit connections controlled by the letter-keys, and a supplemental circuit including an electromagnet 14, and ar-
40 mature 15, for breaking the key-circuit, and a circuit-closer operable by the "hyphen" or similar key for closing the supplemental circuit to throw the key-circuit out of operation and omit the counting by the line-spacing,
45 substantially as herein specified.

2. In combination with a type-writer, a counter, key and space circuits connecting the type-writer and counter, and means for closing said circuits through the movement of the letter-key and space-bar, a magnet 14 and
50 a supplemental circuit including the same, an armature 15 for interrupting the key and type circuits, and a circuit-closer controlled by the hyphen or similar key, substantially as herein specified. 55

3. In combination with a type-writer, a counter, key and space circuits connecting the type-writer and counter, and means for closing said circuits through the letter and space keys, contact-springs 5, 6, in a branch
60 of the space-circuit, and an arm 7 connected to and controlled by the movements of the carriage rack-bar, substantially as herein specified.

4. The combination with a type-writer, of
65 a registering mechanism including a vibrative armature, electromagnets A, A', and type and space circuits controlled by the letter and space keys respectively, and a switch for alternately cutting out the magnets after the
70 initial pull thereof, substantially as herein specified.

5. The combination with a type-writer, of an armature C, two electromagnets A, A', for oppositely moving the same, connected regis-
75 tering mechanism operated by said armature and electrical connections from one magnet to the type-keys and from the other magnet to the spacing-lever, arranged as shown so that the type-keys will move the armature in
80 one direction and the spacing-bar will move it in the other and thus register the first letter in each word and thereby the total number of words, substantially as herein specified.

Dated this 7th day of January, 1898.

EDWARD MCHUGH.

Witnesses:

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ANGELO FAHIE.