

Cryptographic.

No. 727,213.

PATENTED MAY 5, 1903.

F. SEDGWICK.
CIPHER TYPE WRITER.
APPLICATION FILED SEPT. 3, 1898.

NO MODEL.

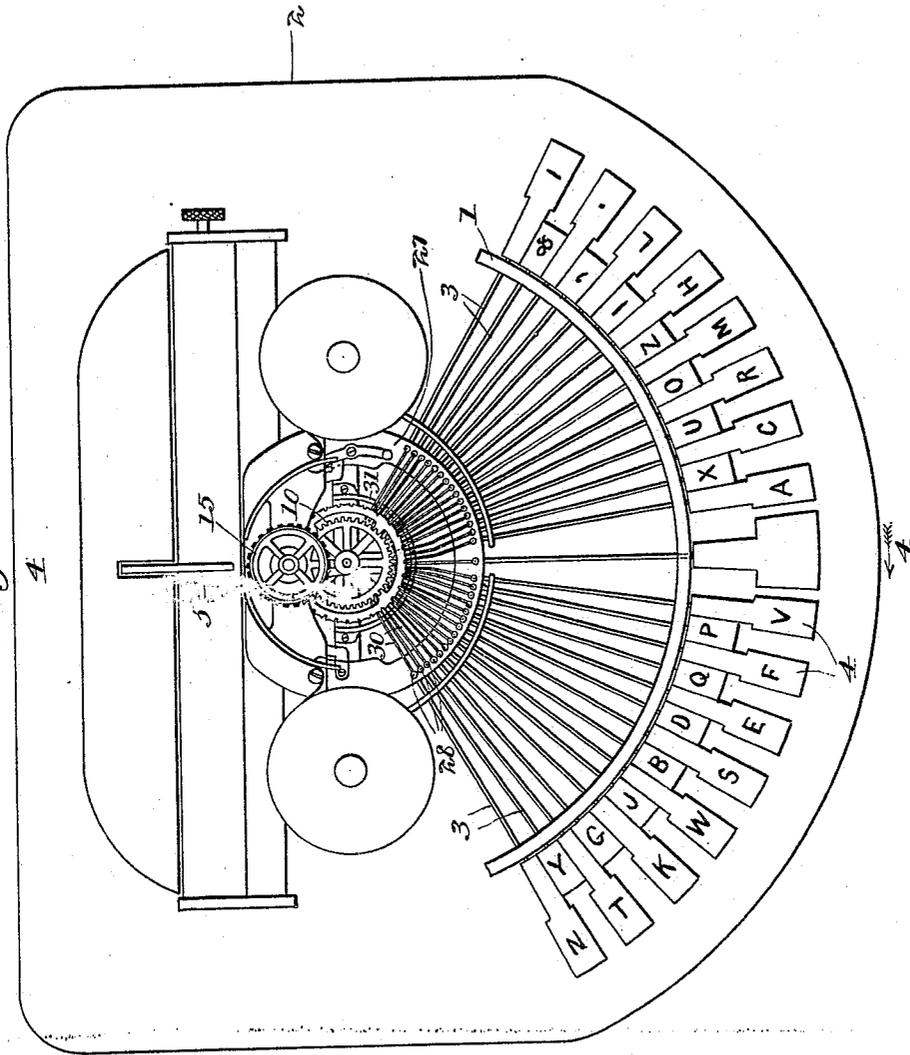
3 SHEETS—SHEET 1.

7979
9210

g

T 9079 V
X 9210
V

Fig. 1



Witnesses.
Wm. M. Rheams
Arnold Bantitt.

Inventor
Frederick Sedgwick
by Dixon & Fletcher
attys

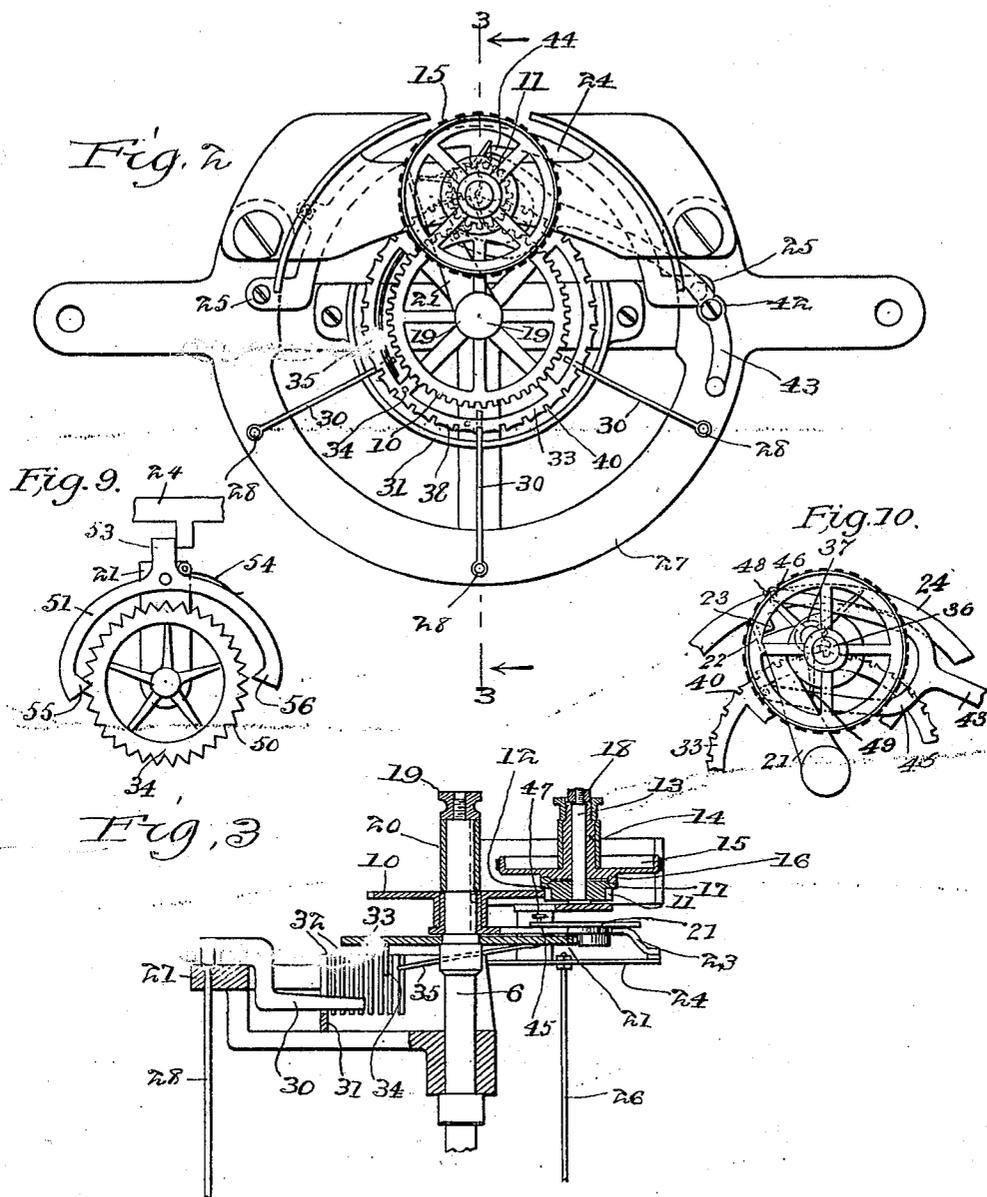
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APPLICATION FILED SEPT. 3, 1900.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses
 Wm. M. Rhein,
 Harold & Bennett.

Inventor
 Frederick Sedgwick
 by Dixon & Fletcher,
 Attys

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NO MODEL.

3 SHEETS—SHEET 3.

Fig. 4

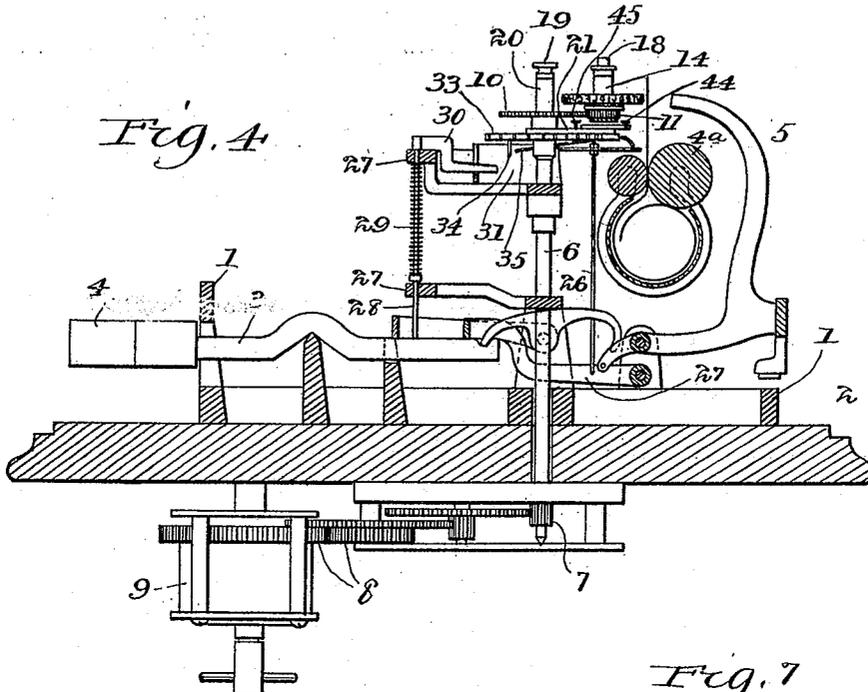


Fig. 5

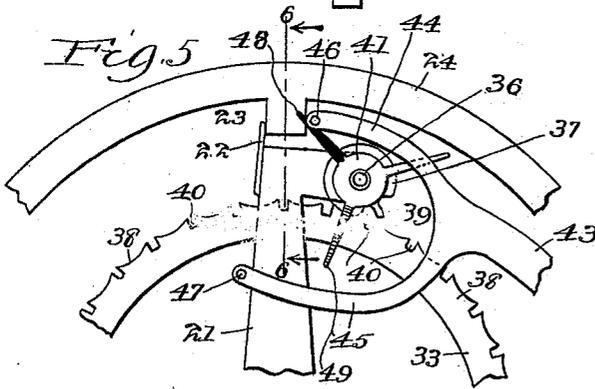
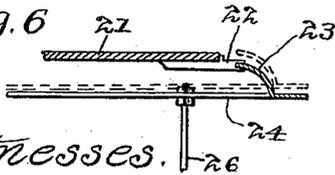


Fig. 6



Witnesses.

Wm. M. Rheams
Howard G. Brown

Fig. 7

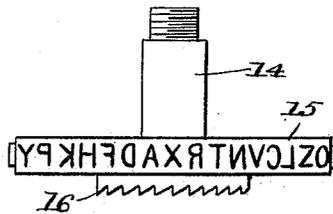
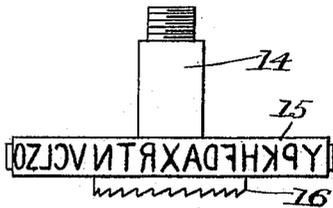


Fig. 8



Inventor:
Frederick Sedgwick
Dixon & Pletcher

Attys.

UNITED STATES PATENT OFFICE.

FREDERICK SEDGWICK, OF CHICAGO, ILLINOIS.

CIPHER TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 727,213, dated May 5, 1903.

Application filed September 3, 1898. Serial No. 690,200. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SEDGWICK, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cipher Type-Writers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which corresponding characters of reference in the different figures indicate like parts.

The object of my invention is to so construct a cipher type-writing machine that it may automatically, as the result of an arbitrary predetermined arrangement of the printing characters in their relation to a given keyboard, transform any desired message into a cipher form incapable of translation except by one having a like machine and possessing the key or combination by which it may be set to translate the previously-printed cipher.

In harmony with this principle my invention consists in providing one or more character-forms, preferably in the shape of disks or type-wheels, each character-form having a series of characters thereon from which a printed impression may be taken and each being provided with means whereby said characters may be arranged in any predetermined and arbitrary relation with respect to an arbitrary zero-point as well as to a set of operating-keys, the arrangement of which latter is permanent and constant, the relation between the two being such that when a given key is actuated another and different character from that represented thereon may be printed.

My purpose is to so arrange the characters and keys with respect to each other that when the latter are actuated the result will be an apparent heterogeneous conglomeration of printed characters constituting a cipher, the translation of which can only be made by one having the key to or a knowledge of the relative combination of the printing-forms, and having such key the printing-forms may be arbitrarily rearranged to harmonize therewith, so that the striking of the keys in the order of the printed cipher will result in the automatic translation of said printed cipher and the printing of the message in its original form.

A further object is to provide automatic means for changing the relation between the characters represented by the respective keys and those upon the type-form at predetermined intervals and means for measuring the intervals automatically, whereby the relation of the characters to the keys may be changed, consecutively or otherwise, so that the depression of a given key may cause different characters to be printed at different times.

From the foregoing it follows that with two machines of identical construction located in different places a message may be printed in cipher in one place, and the cipher (which may be transmitted by telegraph, mail, or otherwise) may be translated by the use of the machine at the receiving-station by merely striking the keys corresponding to the characters of the cipher, provided the party receiving the message is in possession of the secret key of the sender of the message and sets his machine to conform thereto, all of which is hereinafter more particularly described and claimed.

In the drawings, Figure 1 is a plan view of a machine embodying the features of my invention. Fig. 2 is an enlarged plan view in detail of the printing type-wheel and the mechanism immediately connected therewith for shifting the characters in their relation to the keys. Fig. 3 is a vertical sectional view taken upon the line 3 3, Fig. 2, viewed in the direction of the arrow there shown. Fig. 4 is a vertical sectional view of the machine, taken upon the line 4 4, Fig. 1. Fig. 5 is an enlarged plan view in detail, showing a part of the shifting mechanism for changing the relation of the characters and keys, including that for reversing the direction of movement of the shift. Fig. 6 is a vertical sectional view of the stop mechanism for stopping the type-wheel in an initial position. Fig. 7 is a face view of one of the type-wheels. Fig. 8 is a similar view of a type-wheel, showing a modification of said invention for the purpose of reversing the action, so as to translate the cipher. Fig. 9 is a detail view showing modified means for automatically shifting the initial position of the type-wheel, and Fig. 10 is an enlarged detail view showing the means for automatically shifting the type-wheel.

While my improvement is capable of being applied to various forms of type-writing machines, I prefer to apply it to some form in which the type-characters are placed upon wheels, disks, or segments, and for purposes of illustration I have shown the same applied to that type of machine known to the public as the "Hammond."

Referring to the drawings, 1 represents the frame of the machine, which is mounted upon the usual base 2. A series of type-levers 3, provided with keys 4, are mounted in the frame and are in operative connection with the usual ratchet mechanism for feeding the paper roll 4^a, Figs. 1 and 4, and for actuating the type-hammer 5, all of which mechanism is so well understood in the machine referred to as to require no detailed description.

A vertical shaft 6, mounted in suitable bearings, is centrally located in the machine, as shown, and is provided with a pinion 7, Fig. 4, which is located beneath the base. Connected with said pinion is a train of gears 8, upon the arbor of one of which is mounted a coiled spring 9 for actuating the train. The shaft 6 therefore is adapted to be rotated through the action of the spring and gears, subject to the automatic control of the mechanism hereinafter described.

Upon the shaft 6 is mounted a gear-wheel 10, which engages with a pinion 11 upon a hub 12, loosely mounted upon a stationary stud 13, projecting vertically from the frame, as more clearly shown in Figs. 3 and 4. Loosely mounted upon the stud 13 is a sleeve 14, which forms a part of the hub of a type-wheel 15, having the desired characters upon its periphery, preferably arranged in an arbitrary manner—such, for example, as shown in Figs. 7 and 8. Beneath the type-wheel is a ratchet 16, Figs. 3, 7, and 8, which is adapted to engage and interlock with a corresponding ratchet 17, Fig. 2, upon the hub 12. The type-wheel is held in place and the ratchets in engagement by means of a nut 18, and said type-wheel is capable of being removed and readjusted with respect to the pinion 11, so that any given character upon the type-wheel may be caused to stand normally in an initial position, a knowledge of which relative position forms a key to the automatic translation of the cipher, as hereinafter explained.

Mounted upon the shaft 6 and removably secured by means of a nut 19 is a sleeve 20, (better shown in Fig. 3,) which is keyed to said shaft, upon which sleeve and adapted to rotate therewith is mounted the gear-wheel 10, adapted to engage pinion 11. Extending radially from said sleeve, to which it is rigidly attached, is an arm 21, Figs. 2, 3, 4, 5, and 6, but better shown in the last two figures, upon the end and side of which arm and extending outwardly therefrom, as shown in Fig. 6, is formed a stop 22, which is adapted to normally engage a detent 23 upon a releas-

ing-yoke 24, made from spring metal and having its ends rigidly attached to the frame, as shown at 25 25, Fig. 2. The releasing-yoke is connected, by means of a rod 26, to the usual releasing-lever 27, which is in operative connection with all of the key-levers. When the keys are at rest and the releasing-yoke is in its normal position, the detent 23 is adapted to engage the stop 22 and prevent the rotation of the type-wheel and hold it in its normal initial position. When, however, a key is depressed, the releasing-lever, which is elastic, is caused to yield as a result of the upward pressure of the rod 26 until it assumes the position shown in dotted lines in Fig. 6 and permits the release of the stop 22, thereby permitting the type-wheel to make one revolution before it is again arrested by the detent 23, which assumes its normal position upon the release of the key. Before the revolution of the type-wheel is completed, however, it is necessary to arrest the type-wheel, so as to present the desired character at the proper point to enable the usual impression to be taken therefrom. This is accomplished by the following-described means: Inserted loosely in bores formed in a semi-circular framework 27 are a series of vertical pins 28, said pins corresponding in number with the keys, each pin being placed above and arranged to engage with a type-lever, so that the depression of a given key will lift a corresponding pin. Spiral springs 29, Fig. 4, serve to depress the pins and also the key-levers and to hold both in normal positions. The pins 28 are arranged in the arc of a circle, and attached to the top of said pins, respectively, are arms 30, all of which extend inwardly toward a common center formed by the shaft 6. In order to avoid confusion in other details, I have shown only three of said arms in Fig. 2 and but one in Fig. 3. They are all shown, however, in Fig. 1.

A semicircular guide-ring 31 is secured to the frame, which ring is provided with a series of vertical slots 32, (see Fig. 3,) adapted to receive the arms 30 and to serve as guides therefor. The radial position of the several arms is thus preserved, while they are free to be moved vertically.

Loosely mounted upon the shaft 6 is a Geneva stop-wheel 33, which serves a double purpose—viz., to arrest the type-wheel at points conforming, respectively, to the characters to be printed and to shift the relative positions of said wheel so that the characters printed will be constantly and systematically changed with respect to given keys, thereby complicating the printed cipher. I will first describe the former function, which, were it not for the continuous-shifting feature, might be performed by the gear-wheel 10. The wheel 33 is positively connected, in the manner hereinafter described, with the arm 21, so as to rotate therewith, and hence the rotation of the type-wheel is controlled thereby, the arrest of the former serving to stop

the latter. Attached rigidly to the wheel 33 is a depending stop-pin 34, the path of which as the wheel is rotated is immediately above the arms 30, but adapted to be arrested by any one of the latter when raised. The depression of a key therefore serves to stop the printing-wheel, so as to cause that type to be brought into position which corresponds to the key depressed. A weak bent spring 35 is attached, as clearly shown in Fig. 3, to the under side of the wheel 33 and is adapted to pass over any given arm 30 when raised and to spring down sufficiently after having passed to engage said arm and prevent a rebound of the wheel, which would otherwise result from its sudden arrest. It will thus be seen that when an arm 30 is raised by the action of the key as soon as the spring passes it and it is engaged by the pin 34 it is locked in position and prevented from movement in either direction until the key is again released, when the shaft 6 continues its partial revolution until arrested by the action of the stop 22.

The arc described by the path of movement of the pin 34 between the ends of the two outside arms 30 represents one-third of a circle and is equal to the circumference of the type-wheel, and the gears 10 and 11 are so proportioned that the movement of the pin 34 throughout the length of the arc described will cause one complete revolution of the type-wheel. This construction is preferred in adapting the invention to the particular type-writer described, although a larger type-wheel might be employed and the gears dispensed with; but this would be objectionable, owing to the greater weight and momentum.

It will be seen from the foregoing that when a given key is depressed the stop 22 is released and the type-wheel is caused to revolve by means of the clockwork until the pin 34 is engaged by an arm 30 corresponding to the key depressed. This contact occurs at a time when the desired character is presented opposite to the type-hammer, and while thus presented an impression is taken by the action of said hammer, when upon releasing the key the type-wheel completes its revolution and is arrested in its normal position by the engagement of the stop 22.

I have stated that the characters are arranged indiscriminately upon the type-wheel. It is obvious, therefore, that if the keys were actuated to print a sentence the apparent result would be a mere conglomeration of characters, each, however, bearing a predetermined relation to a given key according to the relative initial position of the type-wheel as primarily adjusted by the operator. This initial or cipher position may be any arbitrary one within the entire range of characters, except one—viz., that which would cause the characters to be printed as they appear upon the keyboard or in the same manner as in an ordinary type-writer. An arbitrary position upon the type-wheel should be

chosen from which to determine the "key," or what I term the "initial cipher" position. The arbitrary or zero point may be any given one; but for convenience and simplicity I will assume that it is represented by the character "a." Said character having been chosen to represent the zero position or the position on the type-wheel opposite the type-hammer when the type-wheel is at rest, then upon depressing the "a" key "a" would be printed. If, then, the wheel is arbitrarily shifted one notch, as represented by the ratchet-teeth 16, so that "b" would stand at the zero-point, then upon depressing the "a" key "b" would be printed. It follows, therefore, that "b" would represent the initial cipher position. This knowledge is essential in utilizing the key to the cipher. Inasmuch as the act of translation is the reverse of that which takes place in printing the cipher, the translating position of the type-wheel would be as many points or characters upon one side of the zero-point as the initial cipher position is upon the other side. If the initial cipher position were "b," one step to the right of the zero-point, then the "initial translating" position would be the first character to the left, or "z," assuming the characters to be arranged in regular order. It is manifest, therefore, that in setting the type-wheel for translation it should be reversed as many points in one direction from the "zero-point" or "a" as it is moved in the opposite direction when starting to print the cipher.

Assuming, for example, that the operator were desirous of printing in cipher the word "Paris," and that "m" were to represent the initial position of the type-wheel, and that "kfxto" were the characters upon the type-wheel representing under such adjustment the respective keys actuated, and that "y" were the character equally distant from "a" in an opposite direction, then "y" would represent the translating position, and upon placing that character opposite the type-hammer and depressing the keys bearing the characters "kfxto" the word "Paris" would be printed.

In utilizing my invention a cipher might be printed upon a machine by one party and transmitted to another at a distant point by letter or wire, and the party receiving it, knowing the initial cipher-letter upon the type-wheel, would set the ratchet-teeth 16 so that "y" would stand at the zero-point, and thus by striking the keys in the order and corresponding to the characters in the cipher would be able to translate it. In such a machine the initial or normal position of the type-wheel would remain constant during a given operation and could only be varied in accordance with a predetermined key and that by arbitrarily shifting the type-wheel from time to time. This, no matter what the arrangement of characters on the wheel, would in printing a long message cause a regular sequence of characters, which might

furnish a clue to the translation of the cipher, and in order to overcome this possible exigency I have provided means for automatically shifting the relative position of the type-wheel, either consecutively or otherwise, for the purpose of changing the relation between the characters represented by the respective keys and those upon the type-form at predetermined intervals, said means serving to measure such intervals automatically, so that the repeated movement of the same key will cause different characters to be printed.

In Figs. 1 to 5 I have shown a shifting mechanism for the purpose described which is well adapted to the machine to which I have applied my invention; but in its present form it is only adapted to shift the type-wheel upon the printing of every third character. I will first describe said construction, explain how it may be varied, and then describe a modified construction adapted to shift consecutively.

Mounted upon a stud 36, attached to a lateral extension of the arm 21, (better shown in Fig. 5,) is a wheel 37 the periphery of which coincides with the curved notches 38 upon the wheel 33. A single tooth 39 upon the wheel 37 serves to engage corresponding notches 40, formed in the periphery of the wheel 33. The wheel 37 serves to lock the wheel 33 in a stationary position with respect to the arm 21 at all times, except when the tooth 39 is brought into engagement with one of the notches 40, when the wheel 33 is rotated a distance corresponding to the space between said notches. This occurs with each complete revolution of the wheel 37, the two wheels constituting what is commonly known as a "Geneva stop." Immediately above and rigidly attached to the wheel 37 is a star-wheel 41, having three radial arms, as shown. Pivoted to the frame at 42, Fig. 2, is a shift-lever 43, (also shown in Fig. 5,) which is bifurcated at its free end, so as to form arms 44 45. (Better shown in Fig. 5, but represented in Figs. 2, 3, and 4.) Pins 46 47 are extended downwardly from said arms, and one or the other of said pins is adapted to engage the arm of said star-wheel as the arm 21 and wheel 33 are rotated. When the shift-lever is in the position shown in Figs. 2, 3, and 5, it is in an engaging position and with each revolution of the wheel 33 engages an arm of the star-wheel and moves it one-third of a revolution, thereby shifting the pin 34 in the wheel 33 a distance corresponding to one of the curved notches 38, which in turn serves to shift the relative position of the type-wheel and change the relationship of all the characters thereon with respect to the keyboard. This action is continued automatically with each revolution of the star-wheel during the printing of a message. Inasmuch as the wheel 33 rotates from left to right when printing the cipher, the star-wheel, assuming the shift-lever to be in the position shown in Fig. 5, is caused to rotate from right to left, thus advancing the

wheel 33 one notch to the right with each revolution of the star-wheel. It is thus obvious that the relation between the keys and the characters is constantly changing, or, rather, in the construction now being considered that it changes with the printing of every third character. Assuming a given cipher-message to be composed of thirty characters, it follows that the pin 34 would be shifted ten points from its position at the beginning of the message and that the character on the type-wheel which would represent the "initial cipher position" would be the thirtieth character from that bearing the same relation at the outset. It follows, therefore, that in order to translate the cipher automatically the action of the mechanism should be reversed in the same order in which it is advanced. The accomplishment of this result is the object of the shift-lever 43.

In order that the translation may be accomplished, it is necessary in this construction that the position of the star-wheel should be adjusted both for printing the cipher and for translating it. The arms 48 and 49 might be designated by different colors or characters, and in commencing to print the cipher the arm 48 should be placed in the position shown in Fig. 5, with the tooth 39 at the right of the notch 40. Before commencing to translate the lever 43 should be reversed, so as to cause the pin 47 to engage the arms of the star-wheel, and the arm 49 should be placed in the position shown by the arm 48, which would place the tooth 39 in a reverse position or adjacent to the next notch to the left, thereby causing the shifting of the wheel 33 to be made in the inverse order from those made in printing. All that would be necessary, therefore, in translating a given cipher on the same machine would be to make the adjustment indicated of the star-wheel, set the type-wheel back to the translating position, and actuate the keys in the order of the printed cipher, when an accurate translation of the message would be printed.

In order that the operation of the shifting device may be more clearly understood, I will give a brief description of the operation of the parts, beginning with the depression of a key and ending when the stop 22 has come to a rest against the frame 23. Upon the depression of a key the pin 34, which we will assume to be temporarily located at the right of the star-wheel, is permitted to rotate with the wheel 33 as a result of the release of the stop 22 from the stop 23, it being understood that the wheel 33 is loose upon the shaft 6, but is normally locked in position by the hub 37 upon the arm 21, which hub engages with the notches 38. The arm 21 is in turn rigidly connected with the gear 10, by which the type-wheel is directly controlled. When the described release occurs, the wheel 33 continues to move until the pin 34 strikes one of the arms 30 corresponding to the key depressed, it being understood, as stated, that

the depression of any given key acting through the rod 28 serves to lift one of the arms 30 corresponding thereto. The proper character upon the type-wheel being then located at the printing-point, a further depression of the key causes the hammer 5 to be released, thereby permitting it to strike the back of the paper, which causes the latter to be pressed against the character, from which an impression is made thereon. Upon releasing the key the wheel 33 and the arm 21 continue to move until the revolution of the arm 21 is completed, the releasing of the key permitting the part 24 to fall to its normal position when the stop 23 is in the path of movement of the stop 22, by which the movement of the latter is arrested. Upon the depression of a key and the consequent release of the stop 22, as described, one of the arms of the star-wheel—48, for example—is caused to engage with the pin 46, thereby rotating the hub of the star-wheel one-third of a revolution. Upon making two more key depressions it is obvious that a complete revolution of the star-wheel hub would occur, as a result of which the tooth 39 therein would engage with one of the notches 40, thereby shifting the wheel 33 a distance measured by one notch 38, when the wheel would be again locked in position by the engagement of the hub with the next succeeding notch. It is manifest that this movement or shift serves to change the relation between the type-wheel 15 and stop-pin 34, which results in printing a different character from that which would have been printed had the shift not been made. By this movement the type-wheel is shifted from right to left in its relation to the stop-pin 34. In translation the reverse of this movement occurs, thereby causing the original character to be presented to the printing position in the same manner as would occur in the event of a regular transposition of characters in the absence of a shifting mechanism.

Instead of employing but one tooth 39 in the star-wheel three might be used, which would cause the type-wheel characters to be shifted consecutively.

In Fig. 9 I have shown a modification of said invention in which in lieu of the notches 38 and 40 upon the wheel 33 I have substituted ratchet-teeth 50 and in lieu of the star-wheel and wheel 37 an escapement lever 51, pivoted at 52 to the arm 21 and having a short arm 53 in lieu of the stop 22. A light spring 54 is attached to the arm 21 and bears against said lever, so that when the stop 53 is disengaged the escapement-lever will be reversed, thus throwing the pallet 56 into engagement with the escapement-wheel and disengaging the pallet 55. With each revolution, therefore, of the wheel 33 it would be advanced one notch by the action of the escapement mechanism, and hence the characters upon the type-wheel would be shifted consecutively in their relation to the keyboard. It

is obvious that the star-wheel may be shifted by hand at predetermined intervals, thus producing a variation in addition to that caused by the automatic shifting of said wheel, thereby varying the cipher, to translate which would necessitate corresponding shifts in the secondary machine to cause it to conform thereto.

In the star-wheel construction above described the reverse action necessary for translating the cipher would be accomplished by means of the shift-key 43, thereby reversing the direction of movement of the wheel 33; but inasmuch as said modified construction is not adapted to be so reversed the same result could be accomplished by employing a translating type-wheel in which the characters were arranged in inverse order from those upon the wheel used for printing the cipher. Such a type-wheel is shown in Fig. 8, which is the converse of that shown in Fig. 7.

It is apparent from the foregoing that the leading generic feature of my invention consists in producing a type-writing machine so constructed that when a key representing a given character is actuated a different character will be printed; but the same character will not necessarily be repeated by the repetition of such action. In other words, the provision of means for changing the relation between the keys and type characters, either consecutively or otherwise, automatically or arbitrarily serves to so change the characters presented during the printing of a given message that no logical sequence is indicated in the cipher itself, as there would be in a long message were this feature omitted. These results may be accomplished in a variety of ways and may readily be applied to various forms of type-writing machines. Hence I do not confine myself to the construction shown; but

What I claim, and desire to secure by Letters Patent, is—

1. A type-writer in which is combined a keyboard the keys of which denote certain characters, printing mechanism so arranged that the action of a key denoting a given character shall cause the printing of a different character upon the paper and means for continuously changing the primary relation between said characters and keys during the printing of a given message, whereby such message may be translated into a cipher, the characters in which shall vary in their relation to the keys actuated in printing the same, substantially as described.

2. A type-writer in which is combined a keyboard, the keys of which denote certain characters, printing mechanism so arranged that the action of a key denoting a given character shall cause the printing of a different character upon the paper, means for continuously changing the primary relation between said characters and keys during the printing of a given message, and means for reversing the

order of presentation of the characters upon the type-form and for causing the characters originally indicated upon the keyboard to be printed by successively depressing the keys having thereon the cipher characters, substantially as described.

3. A type-writer in which is combined a keyboard, the keys of which denote certain characters, printing mechanism so arranged that the striking of a key denoting one character shall print a different character upon the paper, and means for automatically changing the relation between the characters and keyboard as the keys are actuated, substantially as described.

4. A type-writer in which is combined a keyboard, the keys of which denote certain characters, printing mechanism so arranged that the striking of a key denoting one character shall print a different character upon the paper, means for automatically changing the relation between the characters and keyboard as the keys are actuated, and means for reversing the order of presentation of the characters upon the type-form, substantially as described.

5. A type-writer in which is combined a keyboard, the keys of which denote certain characters, printing mechanism so arranged that the striking of a key denoting one character shall print a different character upon the paper, means for automatically changing the relation between the characters and keyboard as the keys are actuated, and means for automatically reversing the action of said character-changing mechanism, substantially as described.

6. The combination in a type-writer, of a keyboard representing certain characters, a type-form bearing the same characters, means for adjusting said type-form to a predetermined initial cipher position bearing an arbitrary relation to a zero or constant printing-point, so that the striking of any key will print a different character from that represented thereby, means for automatically shifting said type-form in a predetermined order during the printing of a message, means for readjusting said type-form to a translating position bearing a corresponding reverse relation to said zero-point, and means for reversing the order of presentation of the characters in the act of translating, from that employed in printing the cipher, substantially as described.

7. A cipher type-writer in which is combined a type-carrier, keys for actuating the same, means for automatically changing the relation between the type and keys as the writing proceeds and at determined intervals, and means for measuring said intervals automatically, substantially as described.

8. A cipher type-writer in which is combined a movable and adjustable type-carrier having type arranged in disordered relation with respect to the keys, means for adjusting at determined intervals the relative position

of the carrier as the writing proceeds, and means for measuring said intervals automatically, whereby as a result of the operation of the keys to print ordinary characters, the carrier will move to print an arbitrary but orderly series of characters, substantially as described.

9. A machine of the class described, in which is combined a keyboard representing the characters of the ordinary alphabet, a type-carrier bearing characters representative of those of said alphabet, means for varying said representative characters after a predetermined period of use, and means for measuring said period automatically, substantially as described.

10. A machine of the class described, in which is combined a keyboard representative of the ordinary alphabet, a carrier bearing a set of transposed characters to represent those of the ordinary alphabet, means for automatically changing said set of characters, and means for automatically measuring the periods of said change, whereby the same letter of the alphabet will be represented in different parts of the message by different characters, substantially as described.

11. A machine of the class described, in which is combined suitable type, a series of keys for actuating said type, means for automatically changing the relation between the type and keys at determined intervals, and means for measuring said intervals automatically, substantially as described.

12. A machine of the class described, in which is combined a series of type, keys for manipulating the same, means for changing the relation between the type and keys at determined intervals, and means for measuring said intervals automatically, substantially as described.

13. A machine of the class described, in which is combined a movable and adjustable type-carrier having characters thereon, means for adjusting the position of said carrier at determined intervals, means for measuring said intervals automatically, and suitable keys for actuating said carrier, whereby the relation between the type characters and keys is automatically changed, substantially as described.

14. In a type-writing machine the combination of a type-carrying device, keys for bringing the individual type on the carrier into printing position, a paper-carrier, means for impressing the positioned type upon the paper on the paper-carriage, and means for automatically and progressively changing the relation between the characters on the type-carrier and the keys employed for operating the type-carrier.

15. In a type-writing machine involving the combination of a type-carrying device, a plurality of keys for bringing individual type characters into printing position and impressing the same upon a sheet of paper,

and means for automatically and progressively changing the relation between the type characters on the type-carrier and the respective type-carrier-operating keys; means
5 for altering any original or primary relation between the characters on the type-carrier and the devices employed for causing said characters to be printed, whereby variations may be made at will in adapting the type-

writer for use according to any predetermined code of cipher.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FREDERICK SEDGWICK.

Witnesses:

D. H. FLETCHER,
FLORENCE KING.