

(No Model.)

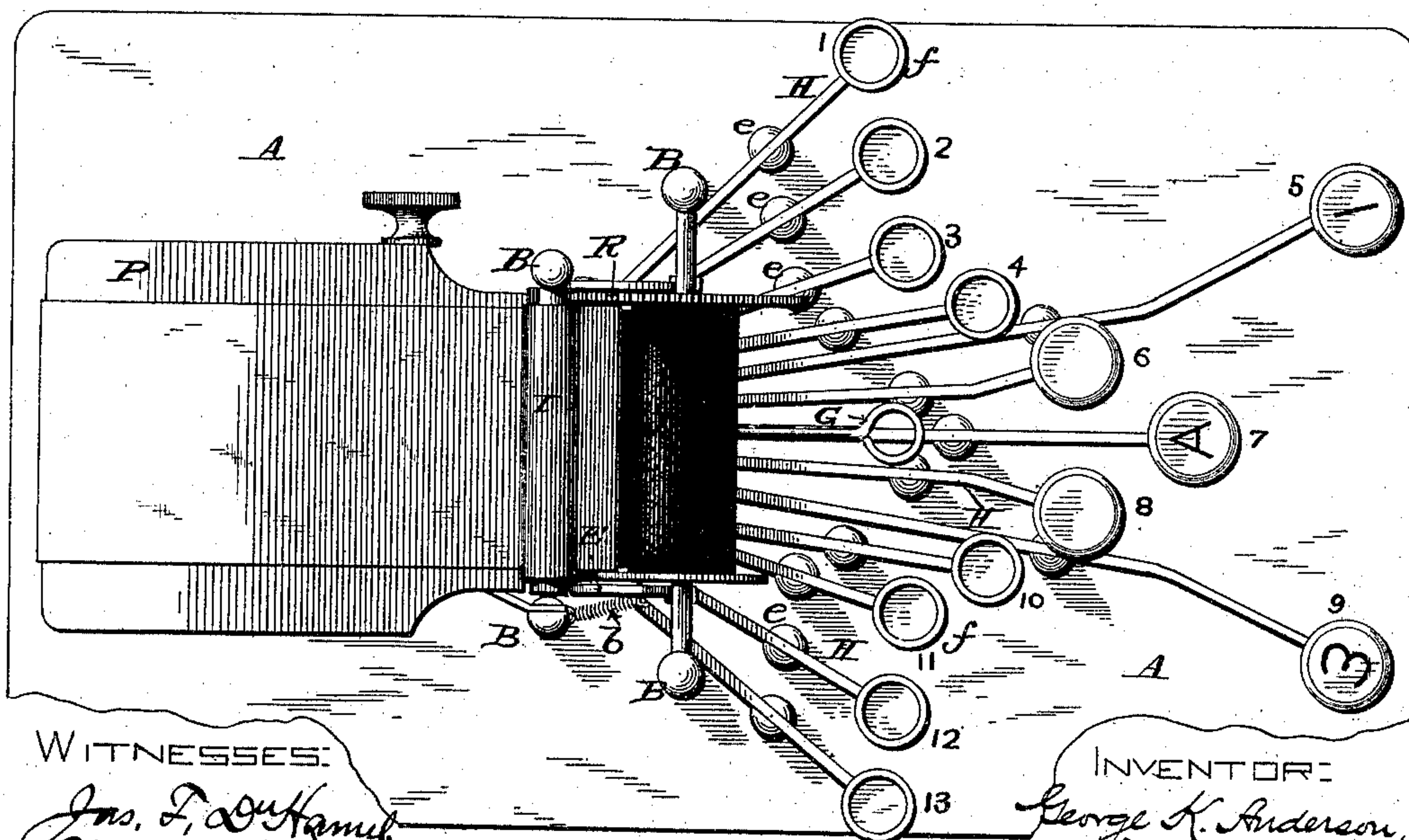
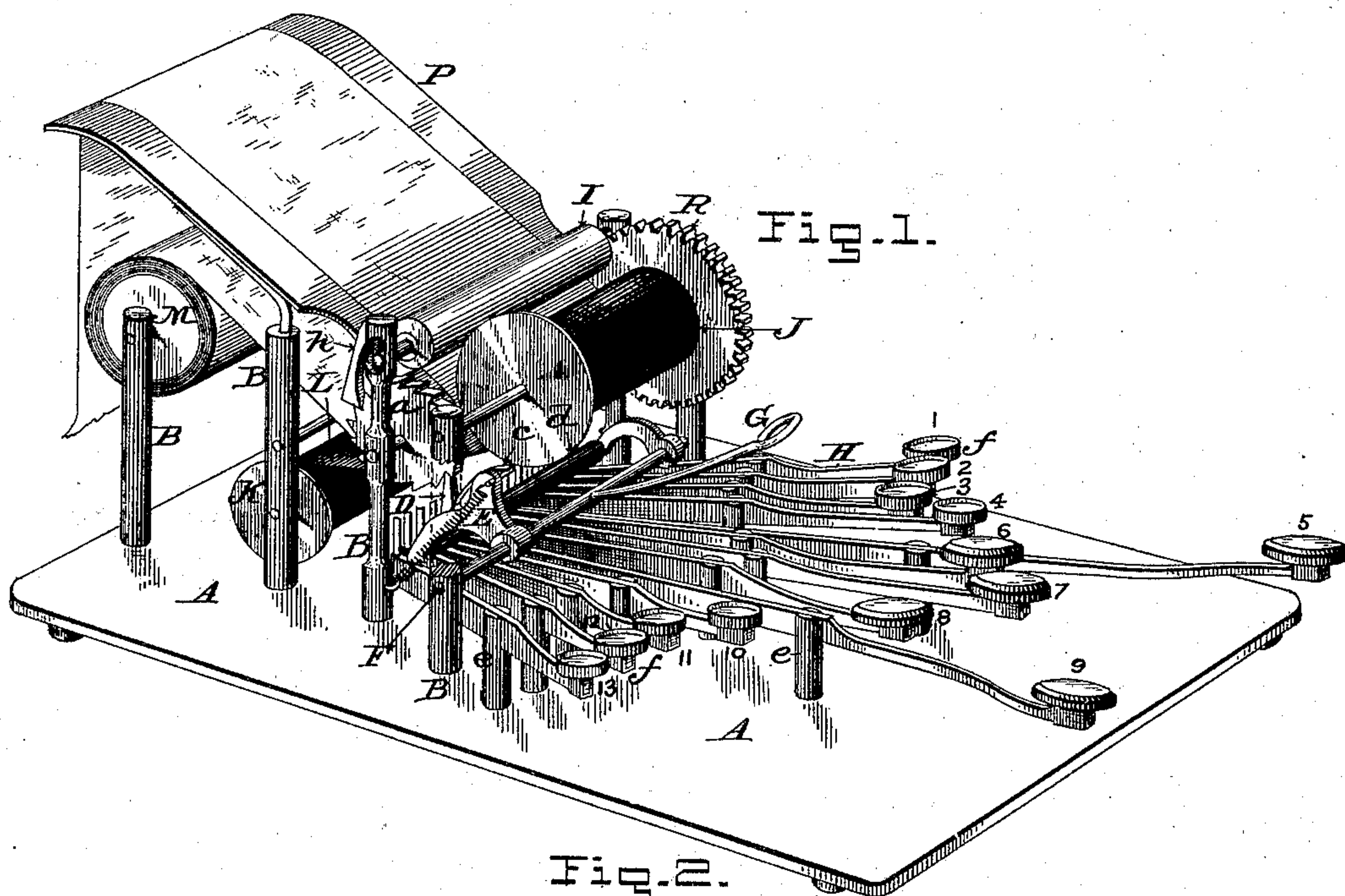
3 Sheets—Sheet 1.

G. K. ANDERSON.

METHOD OF RECORDING SPEECH.

No. 335,171.

Patented Feb. 2, 1886.



WITNESSES:

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(No Model.)

3 Sheets—Sheet 2.

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Fig-3.

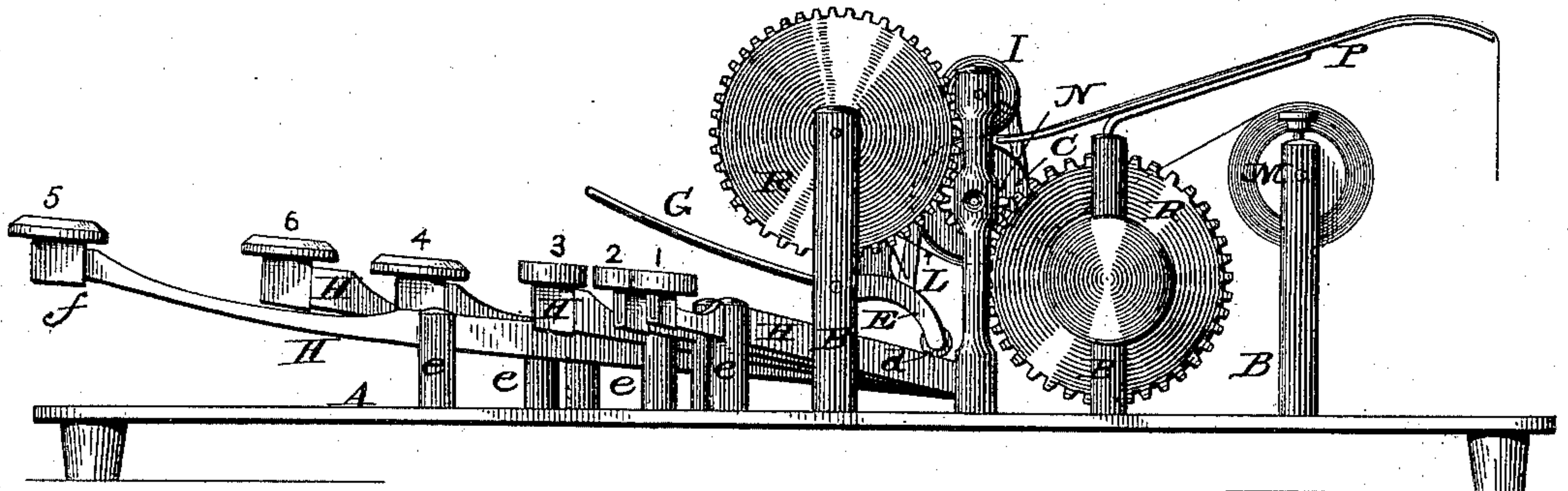
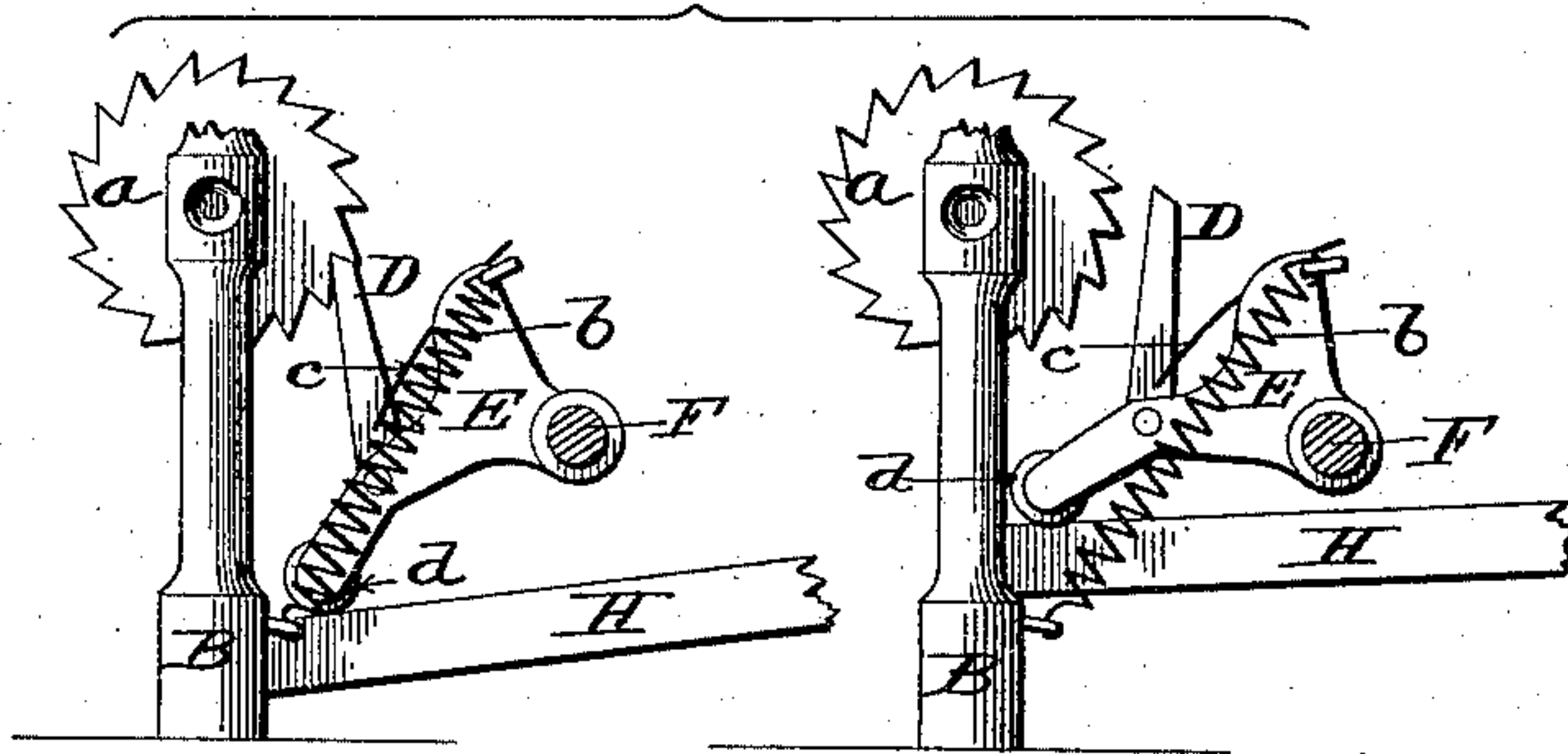


Fig-4.



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(No Model.)

3 Sheets—Sheet 3.

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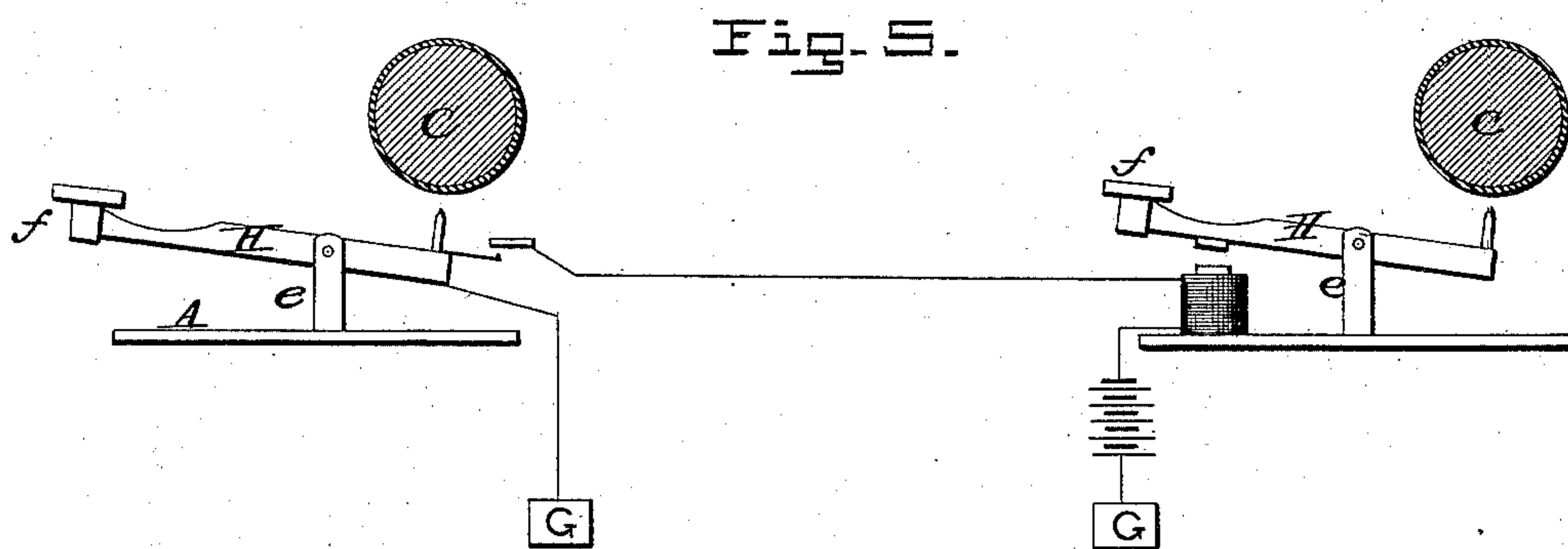


Fig. 6.

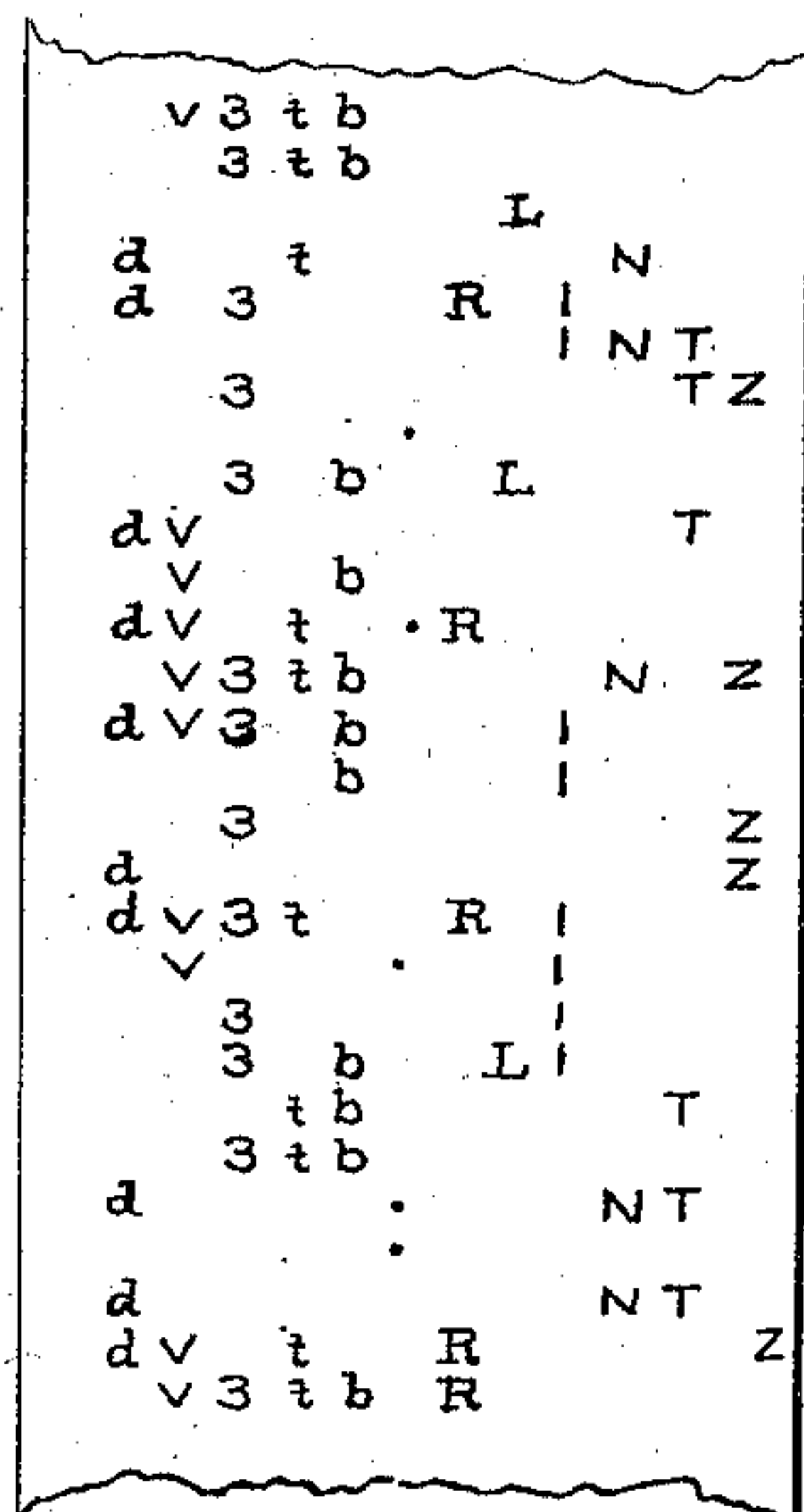


Fig. 7.

(Text)	(Translation)
me	m3
with	th3
at	l
gin	jn
ore	or
not	nt.1
it is	ts3
bill	bl3
ct	kt
fe	f
a per	a pr
means	mns3
any	n
by	b1
is	s3
duced	ds
intro	ntr
I have	lv
which	ch
bill	bl3
that the	th.1
think	th3
I don't	I dnt
dent	dnt
Presi	prs
Mr.	MR.

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UNITED STATES PATENT OFFICE.

GEORGE K. ANDERSON, OF MEMPHIS, TENNESSEE.

METHOD OF RECORDING SPEECH.

SPECIFICATION forming part of Letters Patent No. 335,171, dated February 2, 1886.

Application filed March 8, 1884. Serial No. 123,531. (No model.) Patented in England June 17, 1884, No. 9,048, and in Canada June 26, 1884, No. 19,673.

To all whom it may concern:

Be it known that I, GEORGE K. ANDERSON, of Memphis, in the county of Shelby and State of Tennessee, have invented certain Improvements in Recording Speech, of which the following is a specification.

My invention relates to a method of recording speech, and is designed to lessen the number of different characters required, so that the system or method may be conveniently carried out by mechanical appliances.

The method consists in providing a series of characters—preferably twelve in number—and either of arbitrary configuration or ordinary letters of the alphabet, dividing said characters into three groups, the first containing two characters, which by their independent use or the omission of both indicate to which of three classes the accented or other selected vowel of the word belongs, the second group containing characters, which, combined with those of the first group and with each other represent vowels, numerals, consonants, and combinations of consonants, and the third group containing characters representing independently the letters or sounds of S preceding the second group, and R, L, N, T, and Z, substantially in the order named, following the second group.

Other features enter into the invention, and in order to make its purposes, advantages, and mode of application more clear, I shall describe the same as embodied in a mechanism by which it can be practically carried out, which mechanism is covered by a patent granted to me, bearing date the 28th day of July, 1885, and numbered 323,286.

By the plan thus outlined I am enabled to produce any letter required, any combination of consonants, the letter S preceding such letter or combination, and the letters R, L, N, T, and Z, or any one of said letters following the consonants or combinations of consonants, and also to indicate whether the accented or other selected vowel of the word belongs to the first, second, or third class of the three classes into which the vowels are divided. All these characters, or so many of them as may be required for a syllable, a word, or in some cases more than one word, are struck simultaneously, and by reason of the special order given them I am enabled to write or print stenographically

or in an abbreviated form susceptible of being easily read any word, sound, or combination of sounds that may be produced by the human voice in speaking.

It is essential to the practical carrying out of this method that means be provided whereby the characters may be produced in substantially the order named, and hence I show and shall describe a machine for that purpose, the purely mechanical features of which are described and claimed in the patent above referred to. That machine being, however, susceptible of use in different ways or for carrying out different methods, and my peculiar method being, as I believe, the most rapid and satisfactory one on which it can be operated, I claim such method in this application.

In the drawings, Figure 1 is a perspective view of my improved machine; Fig. 2, a plan view of the same; Fig. 3, a side elevation of the machine; Fig. 4, a detail view of the feed mechanism; Fig. 5, a view illustrating the use of the machine for telegraphic transmission; Fig. 6, a view of the printed slip as it comes from the machine; Fig. 7, the text and translation of the matter contained on the strip represented in Fig. 6.

Attempts have hitherto been made to produce a system and mechanical means by which speech or language might be stenographically recorded, but in every proposed plan, so far as I am aware, each separate letter or all of the vowels or vowel-sounds have been sought to be represented, as well as all the consonants and their various combinations; but in my plan the words are spelled stenographically and the vowels are ordinarily omitted and determined through the context and the marks indicating the accentuation.

Referring now to the drawings, A indicates the base or bottom board upon which the mechanism is mounted, said board being supported upon rubber feet or buttons to prevent undue sound, and B B B B indicate posts or uprights secured upon said base-board to support the mechanism, for which posts upright plates may advantageously be substituted.

C indicates a roll, advisably covered with rubber or other elastic material and journaled in standards or side plates of the frame, in which it is free to rotate in one direction. The roll C is furnished at one end with a

ratchet-wheel, *a*, with which a pawl, *D*, engages, said pawl being pivoted to a rocking frame or yoke, *E*, the arms of which are secured to a rod or shaft, *F*, which is journaled in posts *B*, or in the side plates of the frame, when such plates are substituted for posts. A lever or arm, *G*, attached to and projecting from the shaft *F*, serves to rock said shaft and to swing the yoke *E* upward against the joint action of gravity and a spring, *b*, which latter renders the descent of the yoke quicker and more certain than it would be if dependent upon gravity alone. The pawl *D* is pressed forward and caused to engage with ratchet-wheel *a* by a spring, *c*, but its forward movement is limited so that if the yoke be rocked beyond a certain point the pawl will be withdrawn from engagement with the ratchet and thus prevented from moving or turning the paper feed-roll too far. The horizontal bar *d* of yoke *E* extends across a series of key-bars, *H*, each of which bars is pivoted in a seat or support, *e*, and furnished at its inner end with a sign or character arranged to strike the under side of roll *C*, the several characters being arranged side by side in a straight line, so that they may all be caused to strike simultaneously and to print simultaneously side by side in a straight line across the paper strip, as shown in Fig. 6. Under this arrangement the depression of the button *f* of any key of the series will cause the elevation of the inner end of the key-bar and of the type, die, or character thereon, bringing it into contact with the roll *C*, or the paper which passes under and around said roll, and by simultaneously striking a number of keys a corresponding number of type or characters will be caused to print at once. Backward rotation of roll *C* is prevented by a pawl, *h*, which engages with ratchet-wheel *a*.

Only such characters as follow each other in the required order are printed at one stroke, and there are consequently different widths or spaces between different characters printed at the same time; but those printed are read across the strip in the order of their appearance, and though struck at one stroke may indicate a letter, syllable, or word. Some words require several strokes, and several words are sometimes printed at a single stroke, this depending on the order in which the sounds occur.

The order of the characters is based upon the more general order of the occurrence of certain sounds.

I indicates a press-roll, which has its journals extended into slots in the posts *B* or side frames of the machine, and which rests directly upon roll *C* or upon the paper passing over the same, producing friction and causing said paper to be fed forward by the rotation of roll *C*.

J and *K* indicate two rolls, which carry the ink-ribbon *L*, which ribbon winds from one roll to the other in order to afford a fresh surface for the type to act upon when type are

used. Each of the rolls *J K* carries a gear-wheel, *R'*, and a shifting-pinion, *N*, on the shaft or roll *C* may be adjusted to mesh with either of said wheels, so as to wind the ribbon from one to the other in either direction, in essentially the same manner as is now done in ordinary type-writers. The rolls *J* and *K* are set in such relation to roll *C* that the ribbon is held up close against the paper and kept in contact with or close to the same at all times. Paper is drawn from a roll, *M*, journaled in standards or in side frames, a long band or strip of paper about two inches in width being wound upon the roll.

Referring now to the keys or key-bars, which are numbered consecutively from 1 to 13 in the drawings, this arrangement or order of characters will be explained, it being the result of careful study, and particularly adapted to enable speech or language to be rapidly recorded. Keys 5 and 9, or their characters, constitute the first group, and said keys respectively bear characters which separately serve to indicate in the first syllable of each word whether the accented vowel of that word belongs to the first or to the third class of accented vowels. If neither of these two characters appears it is understood that the accented vowel belongs to the second class of accented vowels. This division of the vowels into three classes is merely the ordinary division adopted in stenography, and is as follows:

First class.

i in pit.
ee in feet.
oo in foot.
oo in boot.
ew in Jew.

Second class.

e in met.
a in Bates.
u in but.
o in vote.

Third class.

a in bat.
o in pot.
a in ma.
aw in maw.
oi in voice.
i in wise.
ow in cow.

As the right hand is usually most used in manipulating the keys, I provide keys 1, 2, 3, 4, and 6, which are arranged in a curved line, so as to be simultaneously struck by the fingers and thumb of the right hand, with characters which separately represent in the order of their numbers *S*, *D*, *V*, *T*, and *B*, but the last four of which, combined in certain predetermined orders, represent nearly all the consonants required in stenography, and combined with 5 and 9, used jointly, serve to represent the vowels, numerals, a few of the consonants, and certain combinations of consonants. These keys 1, 2, 3, 4, and 6, or the characters printed thereby, comprise the second of the three groups.

Keys 8, 10, 11, 12, and 13, in the order named, represent the letters *R*, *L*, *N*, *T* or *D*, and *S* or *Z*, constituting the third group. This order is very important, for the reason that in a vast number and in a very large percentage of words in which two or more of these letters are used they follow each other in the order named; hence the manipulation of the keys to print a number of characters in regular order of the sounds represented is greatly facilitated.

The characters of keys 11, 12, and 13, unless standing alone, are presumed not to be fol-

lowed by a vowel, unless the vowel actually appears in the succeeding line.

Key 7 represents A, AN, AND, or the personal pronoun I, its significance being determined by the context, and this key is independent of the three groups named.

To produce the various letters I form combinations as follows:

5, 6, 9.....A.	2, 5, 9.....O or cipher.
6.....B.	2, 3, 4.....P.
5, 9.....CH	2, 3, 5, 9.....KW or GW or 4.
2.....D.	3, 4, 5, 6, 9.....R or 5.
4, 5, 9.....E.	2, 4, 5, 6, 9.....RT or 6.
3, 6.....F.	1 or 13.....S.
2, 6.....G.	4.....T.
3, 4.....H.	12.....T or D.
3, 5, 9.....I.	4, 5, 6, 9.....U.
2, 4.....J.	3.....V.
2, 3.....K.	2, 3, 6.....W.
2, 3, 5, 6, 9.....L or Fig. 1.	2, 4, 5, 9.....Y or 8.
2, 5, 6, 9.....LT.	2, 3, 4, 6.....Z.
3, 4, 6.....M.	2, 3, 4, 5, 6, 9.....TW or DW or 9.
2, 3, 5, 6, 9.....N or 7.	3, 4, 5, 9.....SH or ZH.
2, 3, 4, 5, 9.....NT or 8.	2, 4, 6.....NG or ING.

In Fig. 6 I have represented a short length of the paper strip as it appears after being printed by the machine, and in Fig. 7 is given the text and translation of the matter represented in said Fig. 6. The strip as here shown is read from the bottom upward, though of course the feed mechanism can be arranged to feed in a direction opposite to that indicated.

The paragraph illustrated reads: "Mr. President, I don't think that the bill which I have introduced is by any means a perfect one. It is not original with me." This is written as below, the text being given at the left, the work of the machine appearing in the middle columns and the interpretation to the right, the reading to be done from the bottom upward, as mentioned.

Key numbers.

	1. s	2. d	3. v	5. 3	4. t	6. b	7. .	8. R	10. L	9. l	11. N	12. T	13. Z	
me.....			v	3	t	b								m8
with.....				3	t	b								th3
al.....									L					l
gin.....		d			t						N			jn
ori.....		d		3				R		l				or
not.....										l	N	T		ntl
it is.....				3								T	Z	ts3
bill.....				3		b			L					bl3
ct.....		d	v									T		kt
fe.....			v			b								f
a per.....		d	v		t			R						a pr
means.....			v	3	t	b					N		Z	mns3
any.....		d	v	3		b				l				n
by.....						b				l				bl
is.....				3									Z	s3
duced.....		d											Z	ds
intro.....		d	v	3	t			R		l				ntr
I have.....			v							l				lv
which.....				3						l				ch
bill.....				3		b			L					bl3
that the.....					t	b				l		T		th Tl
think.....				3	t	b								th3
I don't.....		d									N	T		I dnt
dent.....		d									N	T		dnt
Presi.....		d	v		t			R					Z	prs
Mr.....			v	3	t	b		R						Mr3.

By carefully examining the above illustration of the work, the method will be readily comprehended, and practical use of the system has demonstrated the fact that the ability to print and to read according to my plan is easily and quickly acquired. The fact that the accented vowel is indicated in the first syllable of each word enables said first syllable to be readily determined by the mark which thus indicates it, and hence spacing between words is in most cases unnecessary. Thus in the word or abbreviation "Mr." the figure "3," which is the character struck by key 5, serves not only to show the class to which the accented vowel belongs, but also to mark the beginning of a word, and so, too, in the word "means" and in the word "bill."

In many cases the word and context make the meaning so plain that other separation or indication is unnecessary. The spacing-key is only used where comparatively long intervals are desired between different portions of the work, or where the characters which ordinarily indicate the accented vowel enter into the

combination of characters representing a given letter or word in such a way as to render the point of beginning uncertain. In case neither of the marks before referred to appear, it will be known that the accented vowel belongs to the second series or class. When combined with other characters, those of keys 5 and 9 are always used jointly. If both keys 5 and 9 are simultaneously struck the double mark thereby produced indicates C H. It will be seen, that any arbitrary character, or even a mere dot may be employed for each key, provided the position and relation of each be made clearly apparent. I have, however, adopted letters corresponding to the letters represented by the keys when separately struck, for the reason that they serve to suggest to the operator or reader, the sound represented and to fix in his mind the position or relation of each character produced and its consequent significance.

The positions of the characters of keys 5 and 9 may be varied without affecting their functions, when said characters are themselves

made distinguishable from the other characters used. Thus in the work illustrated the character of key 5 is represented as falling between those of keys 3 and 4 and that of 9 as falling between those of 10 and 11, while in Figs. 1 and 2 of the drawings the keys and their characters are represented as running in regular order of their numbers. This happens from the fact that the machines are built and arranged in both ways, and the two plans are thus illustrated to make clear the fact that the characters of 5 and 9 may be varied as to position.

As mentioned, keys 1 2 3 4 6 are in position to be readily struck simultaneously by the fingers and thumb of the right-hand, and keys 8, 10, 11, 12, and 13 are similarly arranged for the left hand. Key 7 is in such position that it may be struck by the knuckle-joint of the thumb of the left or right hand with or without moving the tips of the fingers or thumb from any of their keys. Keys 5 and 9 are so placed that the inner side of the hand or the fleshy base of the thumb of the respective hands may be readily caused to bear thereon likewise, and actuate said keys simultaneously with the others, without changing the position of the tips or ends of the fingers or thumbs.

In this way any or all of the keys may be simultaneously struck. This peculiar grouping of the keys is of the utmost importance, since it permits thirteen distinct keys to be manipulated with great rapidity without moving the fingers or thumbs of either hand from the keys specially provided for them.

Letters, figures, numerals, syllables, or even words can be printed at a single stroke of this machine as fully as the same are written stenographically.

Spacing may be performed, when required, by operating the arm G.

A paper bed or table, P, guides or supports the paper as it runs out from the machine.

The mark indicating the class to which the accented vowel belongs ordinarily renders spacing unnecessary.

Instead of a single key, 7, two independent keys—one for each thumb-joint or knuckle—may be provided, each bearing a special character, and thus fourteen keys may be simultaneously or independently actuated.

The machine is susceptible of various modifications as to details, but it is important that the keys or their finger-buttons *f* be arranged in two curved lines, as shown, so that the fingers may be placed simultaneously upon ten keys, and that the three or four additional keys shown and described may be operated simultaneously with any or all of the keys struck by the fingers. Thus, instead of pivoted key-bars, a series of upright bars or stems, sharpened at their lower ends or bearing type or dies and raised by springs, may be used, the paper-feeding mechanism being modified or located accordingly, and in like manner other details may be modified or

varied without departing from the spirit of my invention.

The apparatus may be used as a telegraph-instrument, each key completing a circuit when depressed and causing the operation of the corresponding key of a like instrument at a distant point, each circuit including a battery and an electro-magnet to actuate its particular key-bar.

Having thus described my invention, I claim—

1. The method of grouping characters for stenographic printing, which consists in arranging different printing-characters representing consonant and vowel sounds in two groups, those of one group representing the vowels and consonants of the ordinary alphabet combinations of consonants and numerals, those of the other group representing the letters or sounds of S or Z preceding the first group, and R, L, N, T or D, and S or Z following the same, substantially in the order named, and combinations of the same, whereby the several sounds are represented by different characters and combinations thereof, and the impressions of said characters and combinations occupy fixed positions in substantially the order specified.

2. The hereinbefore-described method of phonetically recording words, which consists in providing a set of characters which singly and by combination shall represent the letter S preceding the consonants, vowels, and combinations of consonants of the ordinary alphabet and the sounds or letters R, L, N, T, or D, and S or Z following the same, and then, by simultaneously impressing single characters or combinations thereof, record a whole syllable, word, or more at a single operation.

3. The hereinbefore-described method of arranging the printing-characters in a phonetic recording-machine, which consists in dividing said printing-characters into three groups, one group showing the class to which the accented or other selected vowel of each word belongs, another group containing characters combining with those of the first group and with each other to represent vowels, numerals, consonants, and combinations of consonants, and the third group representing as independent letters or sounds the letter S preceding the second group, and the letters R, L, N, T, and Z following the second group, substantially in the order named, so that when impressions are made from two or more groups simultaneously the record of characters and combinations will appear in the order named in a single line, substantially as described.

4. The hereinbefore-described method of recording words, which consists in providing a set of characters which singly and by combinations shall represent the accented or other selected vowel-sound of each word, numerals, vowel-sounds, consonant-sounds, combinations of consonant-sounds, and in addition thereto the sounds or letters C or S, R, L, N,

5 T or D, and S or Z, together with the various combinations thereof, and then, by impressing single characters or combinations thereof, record a whole syllable or more at a single operation.

10 5. The hereinbefore-described method of designating the accented or other selected vowel of a word, and at the same time showing the beginning of a new word, thereby rendering an extra stroke for spacing unnecessary as between words, which consists in striking a special key at the beginning of a word, and thereby producing an arbitrary mark, to show both the accented vowel and the beginning of a word.

15 6. The hereinbefore-described method of phonetically recording with certainty a number of words equal to and generally in excess of the number of strokes required to make them, which consists, first, in indicating, as described, to which of three prearranged classes the accented or other selected vowel of each word belongs by means of two characters, one of which represents one class, the other another class, and the absence of both the remaining class, thus leaving the two characters to be used jointly as one independent letter; second, in combining the two vowel-marks (used

jointly) and one or more of four other characters to represent by their arbitrary combinations numerals, vowels, consonants, and combinations of consonants, and, third, in the selection and arrangement relatively to each other and to the letters or characters formed, as last explained, of the letters C or S, R, L, N, T or D, and S or Z.

7. The hereinbefore-described method of arranging the printing-characters in a phonetic recording-machine, which consists in placing them substantially in the following order: first, the letter C or S; second, numerals, vowels, consonants, and combinations of consonants formed by the arbitrary combinations of the two vowel-marks used jointly, and four additional letters or characters; third, the letters or characters R, L, N, T or D, and S or Z, and their various combinations, substantially as described, so that when impressions are made from two or more characters simultaneously the record of characters and combinations will appear in the order named in a single line, substantially as described.

GEO. K. ANDERSON.

Witnesses:

E. B. GORHAM,
THOS. C. LOONEY.