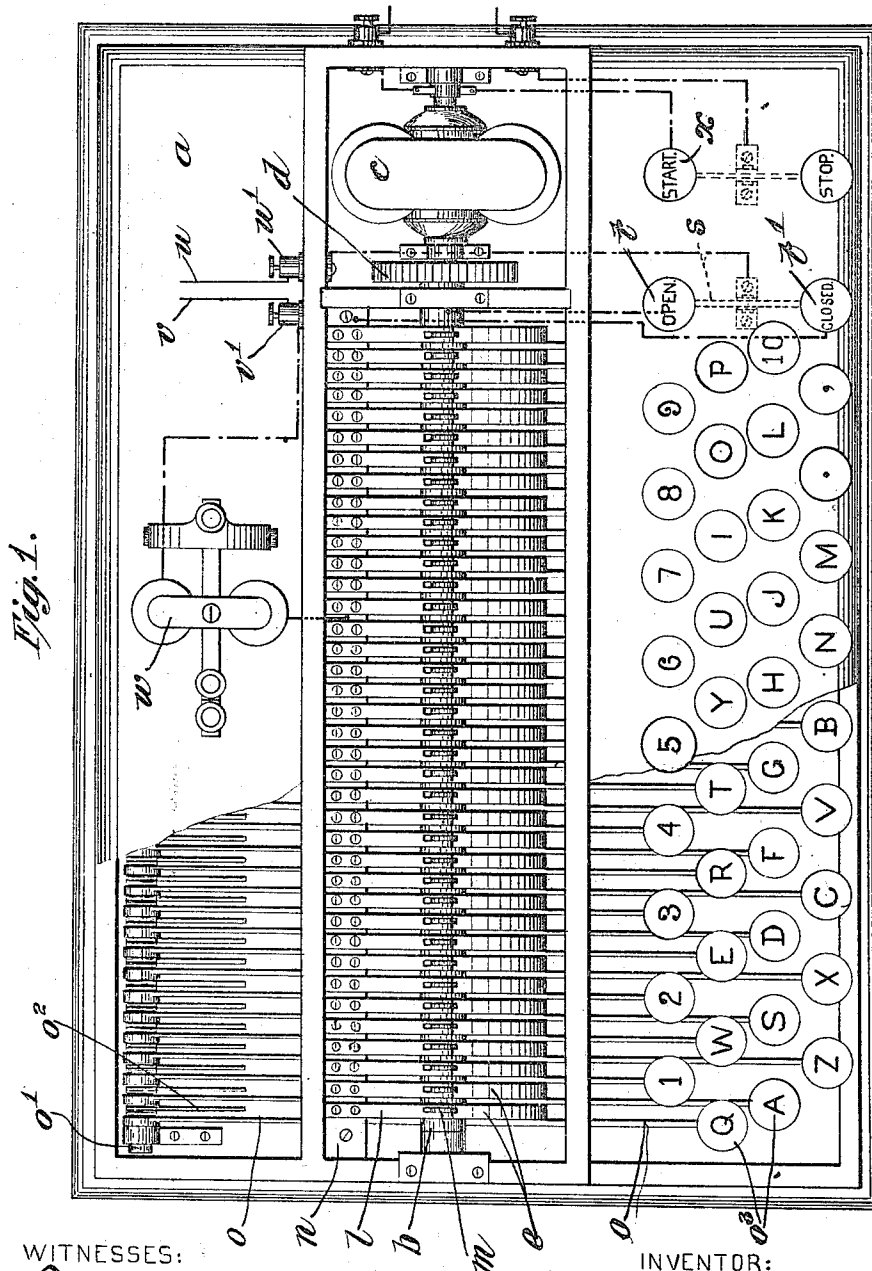


F. S. RUTTMANN.
TELEGRAPHIC SENDING MACHINE.
APPLICATION FILED JUNE 2, 1914.

1,283,320.

Patented Oct. 29, 1918.
3 SHEETS—SHEET 1.



WITNESSES:

R. S. Kennedy
D. Artmann

INVENTOR:

Ferdinand S. Ruttman
by Frank J. Wentworth
his Attorney

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Fig. 2.

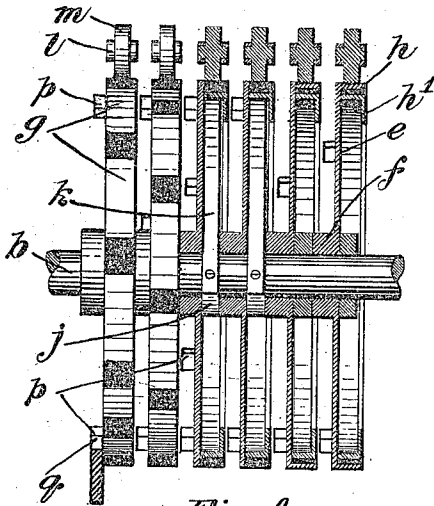


Fig. 3.

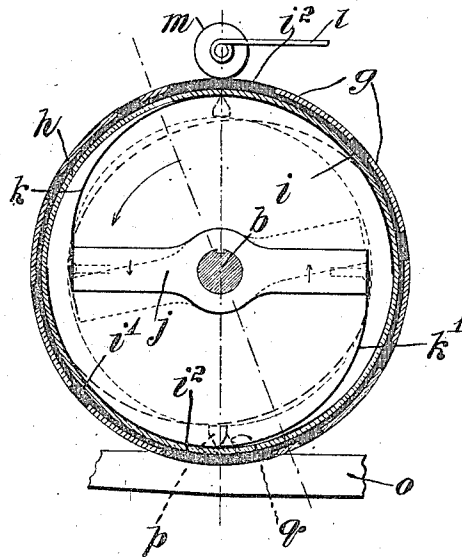


Fig. 4.

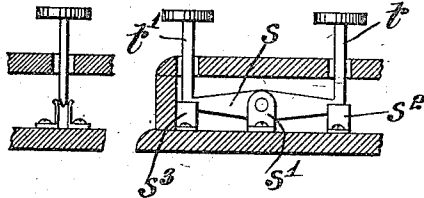
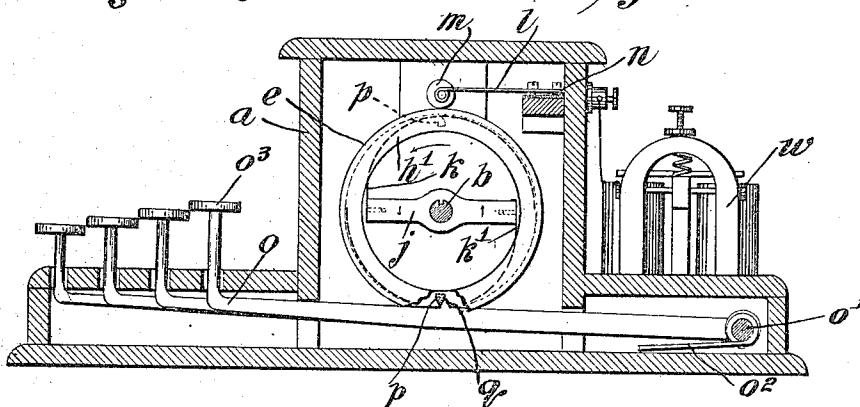


Fig. 5.



WITNESSES:

Edw. S. Kennedy
L. Artmann

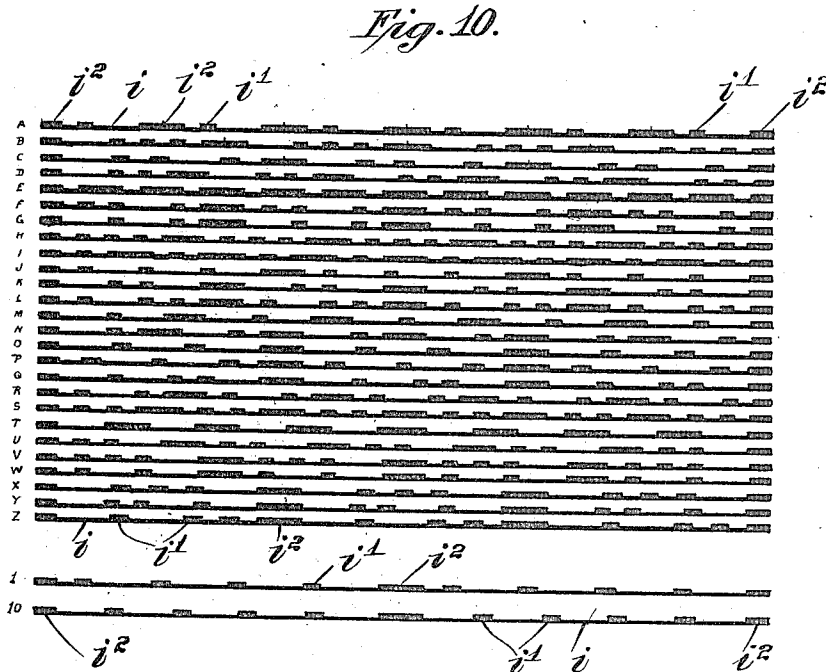
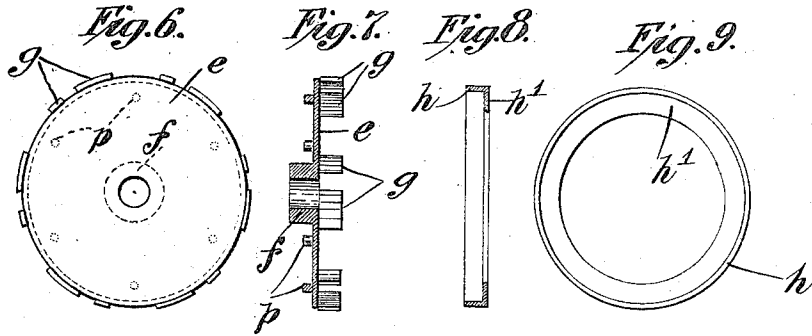
INVENTOR:

Ferdinand S. Ruttmann
by Frank P. Whitworth
his Attorney

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3 SHEETS—SHEET 3.



WITNESSES:

W. S. Kennedy
L. Artmann

INVENTOR:

Gerdinand S. Ruttman
by Frank J. Westworth
his Attorney

UNITED STATES PATENT OFFICE.

FERDINAND S. RUTTMANN, OF NEW YORK, N. Y.

TELEGRAPHIC SENDING-MACHINE.

1,283,320.

Specification of Letters Patent.

Patented Oct. 29, 1918.

Application filed June 2, 1914. Serial No. 842,384.

To all whom it may concern:

Be it known that I, FERDINAND S. RUTTMANN, a citizen of the United States, residing at the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Telegraphic Sending-Machines, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to telegraphic sending machines, and more particularly to a type thereof wherein the line circuit is automatically opened and closed through a manually operative key board mechanism.

In a machine made in accordance with my invention, a primary essential is the provision of mechanically actuated circuit closers capable of alternately opening and closing the circuit, the duration of the flow of the current being varied to secure the dots and dashes used in sending messages by means of telegraphy.

While said circuit closers are mechanically actuated it is essential to provide manually operative means for selectively releasing or permitting the actuation of the different elements representing the different letters and numerals, the speed and duration of the movement of the circuit closing elements, however, being entirely independent of the releasing mechanism and of the operator, except in so far as the mere release of the circuit closer is concerned.

A machine made in accordance with my invention is applicable for use with ordinary land lines, with sub-marine cables or with aerial or wireless system. The machine may be used to control the line circuit, either directly or through a relay including a sounder or it may be used to control a local circuit for actuating a supplemental circuit closer or relay by means of which the actual sending current is controlled.

To permit the proper sending of messages, it is necessary to have each circuit closing element indicate a separate letter or numeral and to provide manually operative means associated with each element to permit the selective actuation of the several elements.

To avoid irregularity in the dots and dashes, I provide a circuit closing mechanism wherein the duration of the flow of the current is determined by the quantity of lineal movement of the movable member of

the circuit closing mechanism. By providing a main actuating mechanism common to all of these elements which mechanism, when the machine is in use, operates at constant speed, and by providing said actuating mechanism and the circuit closing elements acted upon thereby with independent, automatically acting cooperating coupling means, the release of any element, will result in the actuation of said element and said element alone, by said main actuating mechanism, and the stoppage of said element with the circuit broken, immediately upon the circuit having been opened and closed the requisite number of times of the requisite duration to correspond with the code for a single letter or numeral. All of the movable elements are arranged in the same circuit, these elements being operative, one at a time, to close the circuit.

It is desirable to provide a switch mechanism by which the whole mechanism may be cut into, or cut out of, the circuit as desired.

To permit the machine to be used in sending either Morse or the Continental codes, the various circuit closing elements may be made removable, so that one set of elements representing one code may be readily substituted for a set of elements representing another code.

Inasmuch as the duration of the flow of the current is dependent upon the length of the various contact surfaces upon each element and the uniform lineal movement of each of the elements, the contacts representing the dots will all be of the same length and those representing the dashes will all be of the same length, the arrangement of these contacts upon the elements preferably being such as to utilize the entire periphery of each element.

I aim to so construct the various elements that those portions thereof subject to wear, such as the coupling mechanism, may be readily replaced without necessitating a complete renewal of each element.

The invention consists primarily in a telegraphic sending machine embodying therein a circuit controlling mechanism including therein a plurality of independently movable contact carrying elements, electrical contacts cooperating therewith, a main actuating mechanism, normally inoperative means whereby any of said elements may be caused to have movement with said main

actuating mechanism, and manually operative selecting means controlling said elements; and in such other novel features of construction and combination of parts as are
 5 herein set forth and more particularly pointed out in the claims hereto appended.

Referring to the drawings:

Figure 1 is a plan view of a machine embodying my invention with the cover removed and a portion of the casing broken
 10 away;

Fig. 2 is a front view of a portion of the main shaft and the circuit controlling elements mounted thereon, some of said ele-
 15 ments being shown in vertical sections;

Fig. 3 is an end view of Fig. 2;

Fig. 4 is a detail view of the circuit making and breaking mechanism by means of which the machine may be cut in or cut out
 20 of the circuit;

Fig. 5 is a vertical section through the machine;

Fig. 6 is a side view of the metal shell forming the movable contact element;

25 Fig. 7 is a vertical section thereof;

Fig. 8 is a vertical section of the friction ring carried by said contact;

Fig. 9 is a side view thereof; and

Fig. 10 is a projection in elevation of the
 30 insulating partition strips used upon the various elements.

Like letters refer to like parts throughout the several views.

In the embodiment of my invention shown
 35 in the drawings, *a* indicates the frame of the machine having mounted therein a main power shaft *b* which, when the machine is in use, is continuously driven at uniform speed by means of the motor *c* and the gear
 40 train *d*. Loosely mounted upon the shaft *b* and in electrical connection therewith, are a plurality of independently operative contact elements. The construction of each of these elements with the exception of the ar-
 45 rangement and length of the contact surfaces thereon being identical with every other, a description of but one of these elements will be entered into.

Each of these elements comprises a shell *e*
 50 of electrically conductive material, said shell being provided with a laterally extending hub *f* and a plurality of laterally and circumferentially extending peripheral contact blocks *g*. The number and length of the ad-
 55 jacent contact blocks will vary according to the letter represented by its element, succeeding blocks in any sequence indicating the dots and dashes for a given letter being equally spaced apart. When a plurality of
 60 similar sequences are used upon the shell, however, the succeeding sequences are spaced apart by a space approximating the length of those contacts indicating a dash.

Seated within each shell *e* is a friction
 65 ring *h*, and interposed between said friction

ring and the said contacts, is a strip *i* of insulating material having elevated sections *i'* *i''* thereon adapted to fit between the various contacts of each sequence and between succeeding sequences and extend to a
 70 height where they will be substantially flush therewith. This construction affords a continuous bearing surface for each element therein, alternate sections of which are of electroconductive and electro-non-conduc-
 75 tive material. Preferably the friction ring *h* is provided with an inwardly directed side flange *h'* which, together with the side of the shell *e*, forms a channel seat adapted to receive and retain the friction member co-
 80 operating with the said ring.

The shaft *b* has mounted thereon within each shell *e* a laterally extending support carrying a coiled spring which when ex-
 85 panded is seated in the channel formed by the ring *h* and is adapted to frictionally engage, or have slippage with relation to, said ring. Preferably, I employ a plurality of such spring members, for each element, the preferred construction being that shown in
 90 the drawings, which consist of a cross head *j* keyed to said shaft and having one end of the springs *k-k'* secured to the ends of said cross-head. This construction affords a
 95 simple coupling mechanism which will permit a continuous rotation of the shaft, the springs being always in a position where, when the circuit controlling element is released, they will instantly operatively en-
 100 gage and impart rotary movement to the element. The flexibility of these springs will permit that slippage necessary to permit a continued rotation of the shaft *b* independ-
 105 ently of movement of any of the elements.

Projecting over each element, is a spring
 110 arm *l* having rotatably mounted therein a metallic wheel *m* adapted to bear upon and make electrical connection with the blocks *g* upon its element. The arms *l* are mounted
 115 upon, and in electrical connection with the plate or strip *n* of electro-conductive material. While I prefer to use a wheel contact cooperating with each element, as described, because of the reduction of wear
 120 both upon the element itself and the cooperating fixed contact it is apparent that any desired form of contact in lieu of the spring arms *l* and wheels *m* thereon would be op-
 125 erative to close the circuit through engagement with the blocks *g*.

Each contact element has associated there-
 with individual controlling means adapted to normally hold the element against rota-
 130 tion with the shaft *b*, and to be manually actuated to release its element when it is desired to rotate same to impress the current upon the main line, or the local circuit, in accordance with the contact blocks *e* thereon. Preferably this means comprises a key
 135 lever *o*, upon the bar *o'* and acted upon by

the restoring spring o^2 . Each lever o is provided with a finger key o^3 having indicated thereon the letter or numeral corresponding with the letter or numeral indicated by the arrangement and length of the contacts e upon the element controlled by each key lever.

Carried by each shell e is one or more stops p arranged substantially midway between the ends of each insulating section i^2 in advance of or following, each sequence of contacts, and coöperating therewith is a stop q carried by the key lever associated with that element. By means of these coöperating stops, the depression of a key lever will not only release its element, but the return of the key lever to normal will position the stop q so that upon the completion of movement of the element to bring the various contact blocks g of each sequence into electrical connection with the contact wheel m , movement of said element will be automatically arrested.

The shaft b and plate or strip n are included in an electrical circuit from any desired source, said circuit having included therein an electrical switch mechanism by means of which the current may be cut off from the machine. I preferably employ an oscillatory knife contact s , the support s' of which is in electrical connection with one terminal of the circuit, the contact s^2 being in connection with the shaft b and the contact s^3 , with the plate or strip n . The opposite ends of the knife have connected therewith the key plungers $t-t'$ the keys of which have "Closed" and "Open" thereon respectively.

In the accompanying drawings, I have shown the invention as applied to a telegraphic system employing land lines, $u-v$, the terminals of which are connected with binding posts $u'-v'$, the binding post u' being in electrical connection with the support s' and the binding post v' with one terminal of an ordinary telegraphic sounder w . The other terminal of said sounder is in electrical connection with the plate or strip n .

The circuit of the motor c is controlled by means of the switch mechanism x .

The operation of the herein described mechanism is substantially as follows:—

If it be desired to use the herein described machine for sending messages, the switch mechanism x controlling the circuit to the motor c is closed, thus causing the shaft b to be continuously rotated at uniform speed. The key t' is then depressed so as to close the circuit in a manner to include the machine therein, thus incidentally opening the line. When this circuit is thus closed, the current will flow from the line u to the binding post u' ; to the support s' ; to the contact s^2 ; to the shaft b , and thence to each of the rota-

table contact elements mounted upon said shaft; and through the contacts g upon any one of said elements which may be actuated, to the contact roller m , spring arm l and plate or strip n , to the sounder and there-through to the line. Normally, however, each rotatable contact element will be so positioned that one of the insulating blocks i^2 thereon will be in engagement with the contact m coöperating with that element, and hence there can be no flow of the current until one of the rotatable contact elements has been released.

The various rotatable contact elements will normally be held stationary by means of the coöperating stops $p-q$ upon each said element and upon its controlling key lever.

The shaft b in its rotation will carry with it all of the cross-heads j and the friction springs $k-k'$ carried thereby respectively. As said shaft rotates, however, the friction between the springs $k-k'$ and the friction ring h upon each rotatable contact element will have the effect of tensioning the spring, or winding it up slightly to a point whereby slippage will occur between the spring and its ring. Hence, although the shaft is rotated continuously, the spring coupling between it and the various elements will be normally inoperative; but so set as to instantly develop the requisite friction to cause the rotation of any element, when released, with the shaft.

When it is desired to send a message, it is merely necessary to consecutively depress a plurality of key levers o corresponding with the letters or numerals of the message to be sent. As each such key lever is depressed, it will withdraw the stop q carried thereby from within range of its operative relation to the stop p upon the rotatable contact element associated with said key lever, thus permitting said element to turn with the shaft b to the extent determined by the location of the succeeding stop upon said element. Where the letter represented by the element requires a sequence of dots, or of dashes, or of dots and dashes, the duration of the closure of the circuit for each dot and each dash will be uniform as will the interval between succeeding dots, or dashes, or dots and dashes.

The duration of the current impressed upon the line with the making of each contact by means of the rotatable element, thus, it will be observed, is entirely without the control of the operator, resulting solely from the mechanical control of the element from the shaft b by means of the automatically acting coupling between said shaft and said element.

By spacing all of the contacts so that a single sequence or a plurality of sequences will occupy the entire periphery of the rotatable contact element, the duplication of any

letter may be secured and the pauses between letters will be automatically secured.

By using a sounder or other audible electrical device in the circuit controlled by my sending machine, the operator may accurately gage the timing of the actuation of the various key levers.

The shaft *b* being so mounted in the machine as to be readily removable from the machine, any contact element may be removed from said shaft when desired and other contact elements substituted therefor.

When it is desired to cut out the sending machine, or "close" the line, it is merely necessary to actuate the switch by means of its key *t'*, thus causing the line current to pass about the shaft *b* and the various contact elements mounted thereon directly to the plate or strip *n* and the sounder *w*.

By using a plurality of keys arranged in banks as shown, the labor of sending is materially reduced and messages may be sent at the maximum speed by even an unskilled operator. Furthermore, the length of the dots and dashes will always be absolutely uniform and will be sent at the maximum rate to secure high efficiency in the machine.

No particular speed of rotation of the shaft *b* is necessary, and the speed of this shaft may be determined or varied by controlling the speed of the motor in any desired manner.

It is not my intention to limit the invention to the precise details of construction shown in the accompanying drawings, it being apparent that such may be varied without departing from the spirit and scope of my invention.

Having described the invention what I claim as new and desire to have protected by Letters Patent is:—

1. A telegraphic sending machine embodying therein a rotary shaft, means adapted to continuously rotate said shaft, a plurality of independently rotatable contact carrying elements mounted upon said shaft, a plurality of radially extending cross bars carried by and rotatable with said shaft, a plurality of coiled springs secured to each said cross bar upon said shaft and adapted

respectively to expand into engagement with a rotatable element whereby there is a normal tendency of said elements to rotate with said shaft and said shaft is permitted through the tensioning of said spring, to rotate independently of any of said elements, electrical contacts cooperating with and normally insulated from said elements respectively, and key controlling means for each of said elements whereby it is normally held against movement with said shaft, each of said key controlled means being selectively and manually operative to permit such movement of its element.

2. A telegraphic sending machine embodying therein a rotary shaft, means adapted to continuously rotate said shaft, a plurality of rotatable elements mounted upon said shaft, a plurality of electrical contacts spaced apart upon and about the periphery of said elements, said contacts varying in length and arrangement upon different elements, a strip of insulating material seated within each said elements having raised sections thereon adapted to extend outwardly between and flush with said contacts, whereby a continuous bearing surface is formed upon said elements, a metallic ring within each said element and insulated therefrom by said strip, means carried by and rotatable with said shaft and operative upon said metallic ring of said elements respectively, and having a normal tendency to rotate said elements with said shaft, electrical contacts cooperating with and normally insulated from said elements respectively, and key controlling means for each of said elements whereby it is normally held against movement with said shaft, each of said key controlled means being selectively and manually operative to permit such movement of its element.

In witness whereof I hereunto affix my signature, in the presence of two subscribing witnesses, this 28th day of May, 1914.

FERDINAND S. RUTTMANN.

Witnesses:

F. T. WENTWORTH,
CLARICE FRANCK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."