

(No Model.)

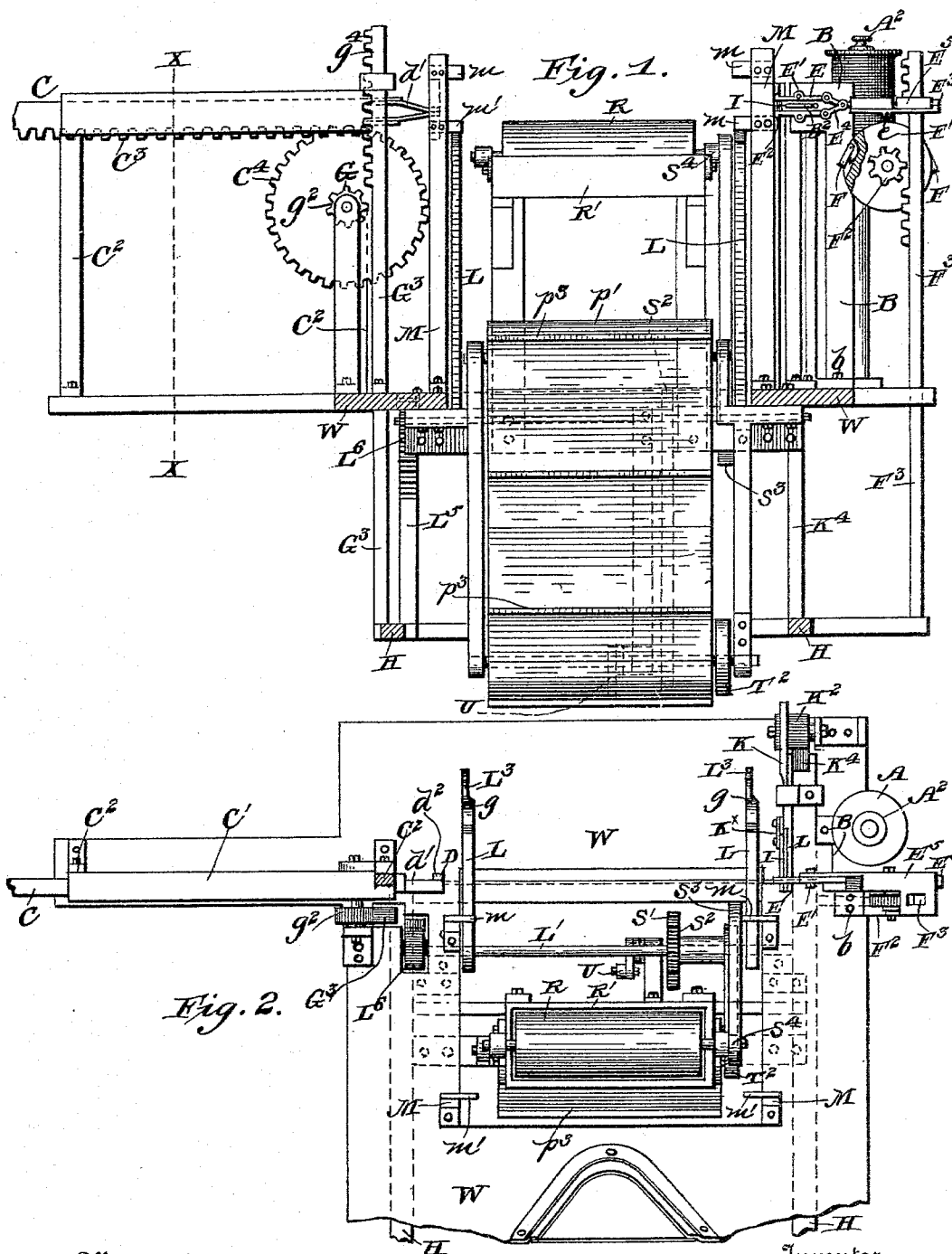
2 Sheets—Sheet 1.

M. GRUBE.

MACHINE FOR FIXING THREADS IN ENVELOPES.

No. 515,524.

Patented Feb. 27, 1894.



Witnesses
O. J. C. C.
Joseph M. Buel

Inventor
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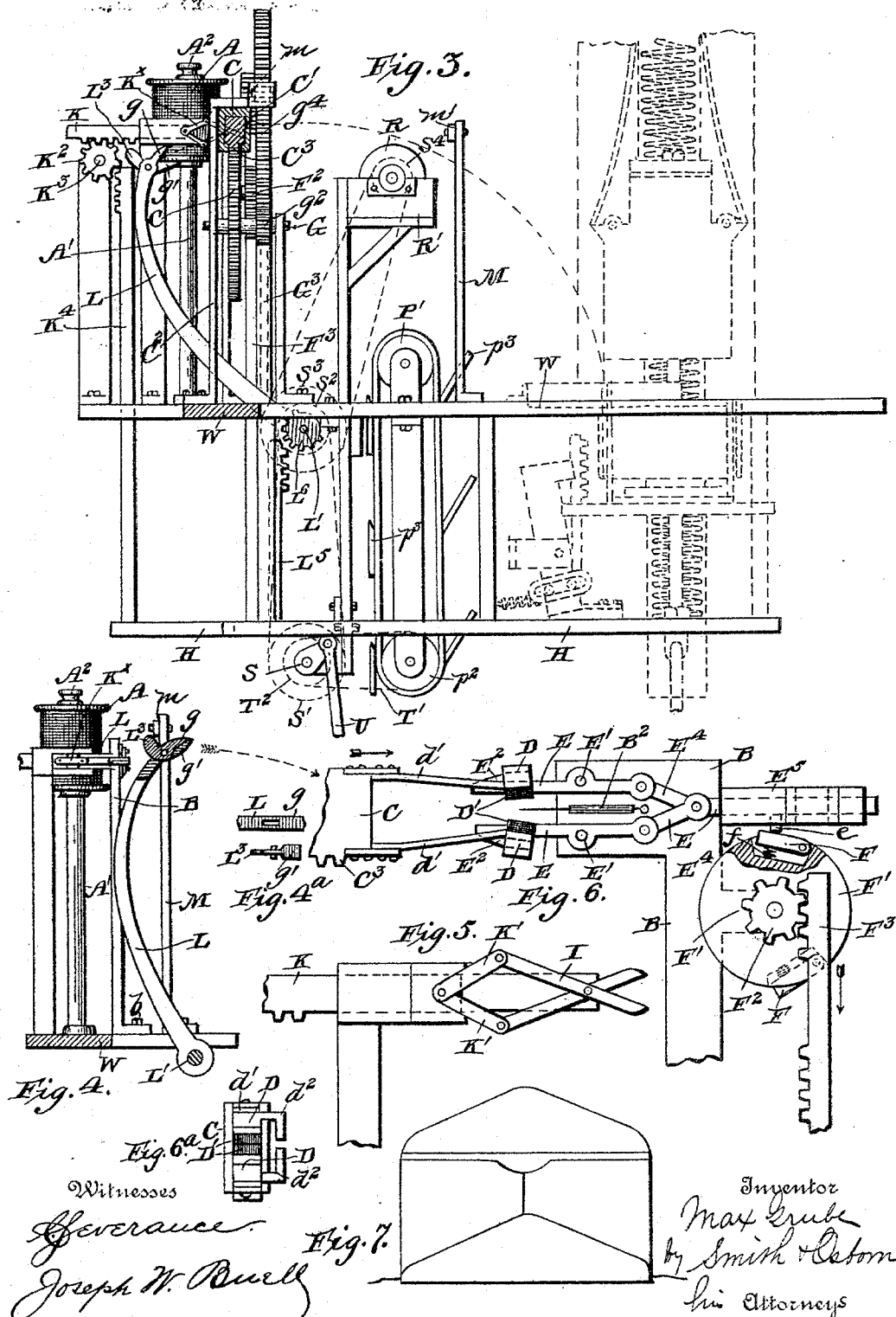
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Severance.
 Joseph W. Buell

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Fig. 7.

Inventor

Max Krue
by Smith & Caton
his Attorneys

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his Attorneys

His Attorneys

UNITED STATES PATENT OFFICE.

MAX GRUBE, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR FIXING THREADS IN ENVELOPES.

SPECIFICATION forming part of Letters Patent No. 515,524, dated February 27, 1894.

Application filed May 17, 1893. Serial No. 474,516. (No model.)

To all whom it may concern:

Be it known that I, MAX GRUBE, a subject of the Emperor of Germany, residing at San Francisco, in the county of San Francisco, in the State of California, have invented certain new and useful Improvements in Machines for Fixing Threads in Envelopes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention has for its object to produce a machine or device for attachment to envelope machines to gum and lay threads in the creases of envelopes at the time of manufacture.

The invention consists in certain parts and combination of parts comprising a thread drawing mechanism operating to draw the threads from a spool in measured lengths, a pair of oscillating fingers to seize the thread and carry it into contact with the gumming device and then lay it in position in the creases or folds of the envelope blanks before the envelopes are folded down and a cutting device to sever the threads from the spool. In connection with these parts there is provided an endless carrier to convey the finished envelope out of the machine. These several parts and mechanisms are connected and combined for joint operation and are adapted to work in proper time with, as well as to be actuated from the folding mechanism of the envelope machine to which it may be attached.

The accompanying drawings show the construction and arrangement of this attachment and also represent it as applied to an envelope machine of the kind known as the Flammer envelope machine, which was patented to J. D. Flammer on the 2d day of September, 1890, No. 435,816. But this attachment can be applied to other styles of machines by making suitable connections between the actuating parts of the attachment, and some moving part of the machine.

In the accompanying drawings, Figure 1 represents the attachment in side elevation and in position on a Flammer envelope machine, parts of the machine being in section.

Fig. 2 is a top view of the parts shown in Fig. 1, with the upper works of the machine above the table cut away. Fig. 3 is a front elevation of the attachment, and a cross section on the line $x-x$, Fig. 1. Fig. 4 shows an elevation of the thread cutters and the oscillating fingers, the upper part thereof being shown in section. Fig. 4^a represents a top view of the gripping jaws of the oscillating fingers. Fig. 5 is a detail view of the thread cutter. Fig. 6 is a detail view showing the thread seizing grippers of the reciprocating bar, and the mechanism which operates the opening of the same. Fig. 6^a is a side view of the thread seizing grippers. The last three figures being on an enlarged scale. Fig. 7 is a view of the finished envelope with the thread therein.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A indicates a spool mounted on an upright pin A' having a tension nut and washer A^2 on the screw thread to apply suitable tension to the spool.

B is a bracket fixed at the foot by screws b, b , to the base W of the attachment, and having a thread guide-tube B^2 .

C is a reciprocating bar sliding in a slotted guide rail C' , that is supported by brackets C^2, C^2 at the opposite side of the base W and in direct line with the thread tube.

At the inner end the reciprocating bar C is provided with thread seizing grippers consisting of the gripper heads D and the flat springs d' by which the heads are connected with the bar C and the purpose of which is to hold the same together. To the gripper heads forming the jaws that seize and carry the thread across the table are attached small pieces of rubber D' or other elastic or yielding material for the purpose of insuring and facilitating the hold on the thread. The gripper heads extend at one side into loops d^2 fitted to take over the ends of a pair of levers E, E , fixed on opposite sides of the thread guide, or above and beneath it against the side of the bracket. These levers operate to open the grippers and then allow them to close upon the end of the thread projecting from the guide-tube, they work on pivots E' and their points or front ends E^2 are a short distance above the edges of the levers to take

the first contact of the heads of the grippers and act to open jaws as the bar C presses the loops d^2 over the levers in the motion toward the thread-guide. The loops allow the jaws to close upon the thread as soon as the projecting ends of the levers are pressed [see Fig. 6]. During the return movement of the bar C the jaws keep closed upon the thread and carry it along across the table, the obstruction to the movement formed by the projecting ends E^2 is removed by bringing said ends together and out of the way of the loops d^2 , through the medium of a sliding bar E^3 connected to the levers E by links E^4 . The bar E^3 slides in a slotted guide rail E^5 forming part of the bracket B and has at the lower edge a projecting pin e . This pin is acted upon to produce the reciprocating motion of the bar E^3 by dogs F pivoted to and situated in recesses of the circular disk F' and held in place by springs f .

The operation of the levers E, E, is as follows: When it becomes necessary for the levers E, E, to operate to perform their proper function, the rack F^3 is given an upward motion, causing the disk F' , through the pinion F^2 , to revolve, the lug or pin e on the bar E^3 is engaged by one of the pawls F in the circumference of the disk and the bar E^3 driven forward, and as the levers E, E, are pivoted at E' , E' , and are connected to the bar E^3 by the links E^4 , E^4 , the rear ends of these levers E, E, will be thrown apart as the bar E^3 advances, causing their forward ends to approach one another, thereby permitting the heads D of the bar C to be withdrawn from the forward ends E^2 of the levers E, as is evident. When the levers E are to be opened again in the performance of their proper function the rack F^3 descends causing the disk to revolve in the opposite direction and the opposite pawl F in the disk F' will engage the lug or pin on the bar E^3 , when the reverse of the above operation will take place. The disk turns around a pin projecting from an arm of the bracket B, it connects with a pinion F^2 to which motion is imparted by the reciprocating bar F^3 having a rack with toothed portion with smooth portion between. The lower end of the bar is attached to a reciprocating frame H, which will be hereinafter more fully described. The movement is given to the bar C from a shaft G beneath it, and a rack C^3 on the bottom of the bar and a gear C^4 on the shaft and being so arranged as to give the parts the required throw back and forth, the length of which movement will be governed by the length of the thread that is used for laying in the envelope. The shaft G is actuated in this construction by a pinion g^2 and a reciprocating upright bar G^3 having a rack or toothed portion with smooth portion above and below the toothed portion g^4 to clear the pinion. The lower end of this upright bar is attached to the reciprocating frame H, that is moved by the treadle frame or part of the envelope machine that operates the fold-

ing mechanism. In the machine herein shown and described the parts are operated by a treadle and the movements are reciprocating ones, and I therefore employ connecting means of suitable character, to apply the same movement for actuating the several devices of the thread fixing attachment. In machines having rotary shafts however the connections would be made between a shaft of the machine and a rotating shaft in the attachment by means of a belt or pulleys, or by a set of gears suitably proportioned to obtain the required movements of the parts.

The parts that pertain to the envelope machine proper are shown in dotted lines Fig. 1, except the table W and the reciprocating frame H which actuate the various parts of the envelope, as well as the parts of the thread fixing machine, through the medium of the different rack bars, two of which F^3 and G^3 have heretofore been mentioned. A similar arrangement of reciprocating rack bar pinion and shaft operates the thread cutter on the same side of the attachment where the thread spool is set and also the oscillating fingers. The frame H receives the reciprocating motion from the treadle of the envelope machine through the medium of a connecting rod.

The cutter [Fig. 5] is composed of two pivoted blades I connected at the rear ends to a slide bar K by links K^x with the pivots or cutting portions standing just back of the thread guide-tube, but also to one side of the end of the tube, so that being projected forward and backward the cutting edges will sever the thread at a point sufficiently beyond the end of the tube to leave the end portion of the thread standing beyond the tube to be seized by the grippers. This portion of the cutters is seen in Figs. 2 and 3, while their construction is shown more clearly in the enlarged detail Fig. 5. The cutter operating bar has a toothed edge taking a spur gear K^2 on a shaft K^3 to which rotary motion back and forth is given by the reciprocating bar K^4 of the frame H and the gear K^2 on the shaft K^3 . These parts above described constitute the thread drawing and cutting devices that operate to pull the thread from a spool A at one side of the table and carry it across parallel with, but at some distance above as well as back of the crease or fold at the bottom of the envelope as it lies on the table of the machine. In this position of the thread which is represented by the broken line Fig. 2, it is held by the grippers at one side and by the spool at the opposite side ready to be seized by a pair of oscillating fingers or vibrating arms L, L, that swing in an arc from a center of movement L' beneath the table W and in a vertical plane at right angles to and across the path of the thread drawing bar. Movement is given to the arms L by the reciprocating rack L^5 on the frame and a mutilated pinion L^6 on the rock shaft L' . The arms are fixed to the shaft at a suitable distance apart to seize the thread at points furnished with grippers g , g' on the upper

ends that are opened and closed at proper time in the movement of the arms by means of stops m, m' , on upright parts M upon the table. The nippers of each arm consist of a movable jaw g' pivoted to the fixed jaw g , the movable jaw having a curved finger L^3 extending backward, and projecting above the arms in such positions that being brought in contact with the stop m in the movements of the arms it is closed upon the thread at the beginning of the forward throw and is opened on the return movement by the stops m' to release the thread already attached to the envelope, and be set to seize the next length of thread and carry it forward. The throw of these arms and the movement of the thread cutters are so timed with respect to each other that the thread is detached from the spool as soon as the nippers have closed upon the thread. Soon after the nippers g, g' , have taken hold of the thread they are closed upon it by the stop m and kept in that position by the friction existing between them, they describe an arc that ends at the crease or fold of the last folded flap of the envelope as it lies under the folding mechanism of the machine, and the arms completing such throw remain at rest until the last flap of the envelope is folded down into place, and the folding mechanism has released the finished envelope. When these operations of laying the thread and folding flaps are completed, the arms make the return movement and still hold the thread, they take the envelope from the table by the thread and carry it to an endless carrier P where the nippers are opened by the stop m' to release the thread.

It will be observed that the jaws g, g' , are held together by their own friction, which is very slight, and that upon a return of the arms L, L to their normal position, the jar of the reverse movement and the additional pull of the envelope will serve to open the jaws sufficient to bring the curved finger L^3 in contact with the stop m' , thereby causing the jaws g, g' , to be opened to their full extent and release the thread.

It is evident that the movement of the various rack bars and pinions are to be proportioned in such manner so as to impart to the different parts of the machine the proper motions at the proper time.

The carrier is an endless apron mounted on rollers p', p^2 , and provided with pockets or receptacles formed of boards p^3 that are hinged to the apron to open and stand outward on the front side where they travel in a downward direction, and to close against the apron on the opposite side while traveling upward. The grippers are operated by the stop m' to open and discharge the envelope just as it arrives over the carrier, so that the receptacles catch the envelopes and carry them to a point of discharge below the table out of the way.

A gumming device placed over the endless carrier operates to coat the thread with ad-

hesive material while it is being carried forward to the envelope, and is composed of a roller R journaled in a gum-trough R^x and rotated from a shaft S below, by a series of belts and pulleys S', S^2, S^3, S^4 . The shaft from which this motion is obtained also connects with the lower roller of the endless carrier by a belt T^2 and the shaft itself is worked by a crank and pitman U from the treadle of the envelope machine.

The gumming roller is set with its periphery in such close relation to the path of the thread held in the nippers that the thread touches the coating of adhesive substance on the roller just enough to become charged or covered with it. Thus in the forward movement of the arms the thread is carried over the roller and is gummed before it is laid upon the envelope blank. In adjusting this thread laying mechanism to the envelope machine it is necessary to regulate the movement of the folder that folds the last flap or bottom flap of the envelope, so that the arms carrying the thread into position shall not interfere with the folder, and shall discharge and come to rest upon the table just in advance of the descent of the folder.

As thus constructed and arranged the attachment operates in connection with the folding mechanism of the envelope machine, to cut off a length of the thread, gum and lay it in the fold of the envelope at the time of manufacture.

Having thus described my invention, what I claim is—

1. In a machine for fixing threads in envelopes the combination of a pair of oscillating arms or fingers having intermittent movement in an arc and provided with nippers or thread seizing devices on the ends, a thread drawing and measuring mechanism adapted to draw and lay a line of thread across and in front of the oscillating fingers consisting of a spool or bobbin supplying thread and situated at one side, and a reciprocating bar having intermittent rectilinear movement across the path of the fingers from the opposite side and provided with nippers which seize the threads at the end of the forward movement to draw it from the spool across and in front of the fingers, a thread cutting device operating to sever the thread thus drawn from that on the spool, a gumming roller having rotation in a trough from which it receives a coating of adhesive material, and located in the path traversed by the thread to come in contact therewith when brought forward by the oscillating fingers, and mechanism, substantially as described, to produce the movement of said parts in relative time, as set forth.

2. In combination with the flap-folding mechanism of an envelope machine the oscillating fingers L, L , provided with nippers and mounted on a horizontal shaft having intermittent movement as described, the spool holder B thread guide B^2 , reciprocating bar C

provided with nippers D, D, and having intermittent movement across the path described by the ends of the oscillating fingers, the thread cutters K, K, and mechanism by which the fingers, reciprocating bar and thread cutter are actuated with relation to one another, to draw and lay a line or piece of thread from the supply spool, across the oscillating fingers, sever the thread, and finally by the forward movement of the fingers to lay the thread upon the envelope, as set forth.

3. In a machine for fixing threads in envelopes the combination with the oscillating fingers L, L, the thread supply and an envelope holding bed or platform, of a gumming roller adapted to take a supply of adhesive material from a trough or receptacle and apply the same to the thread while it is held by the fingers, as set forth.

4. In a machine for fixing threads in envelopes the combination with the thread laying fingers, jaws on the free ends thereof, and means for opening and closing said jaws, of the mechanism for folding the flap in position over the thread, and the endless carrier consisting of bands or belts mounted on rollers and having movement as described, and the boards forming compartments or receptacles

to receive the envelopes from the oscillating fingers and carrying them out of the machine, as and for the purpose set forth.

5. In a machine for fixing threads in envelopes, the combination of a reciprocating bar C, provided with spring actuated thread seizing grippers, consisting of the gripper heads D with small pieces of rubber or other elastic or yielding material D' on their inner surfaces and with loops d^2 extending on either side of the gripper heads D, a spool holder, a thread guide-tube B² between the spool of thread and the bar C, a pair of levers E, E, between the spool of thread and the bar C and at either side of the thread guide-tube said levers working on pivots E', E', and having their points or front ends E², E², a short distance above the lever and being connected by links E⁴, E⁴, to a sliding bar E³, and mechanism, substantially as described, to produce the movements in relative time or relation to each other, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

MAX GRUBE. [L. S.]

Witnesses:

C. W. M. SMITH,

CHAS. E. KELLY.