

(No Model.)

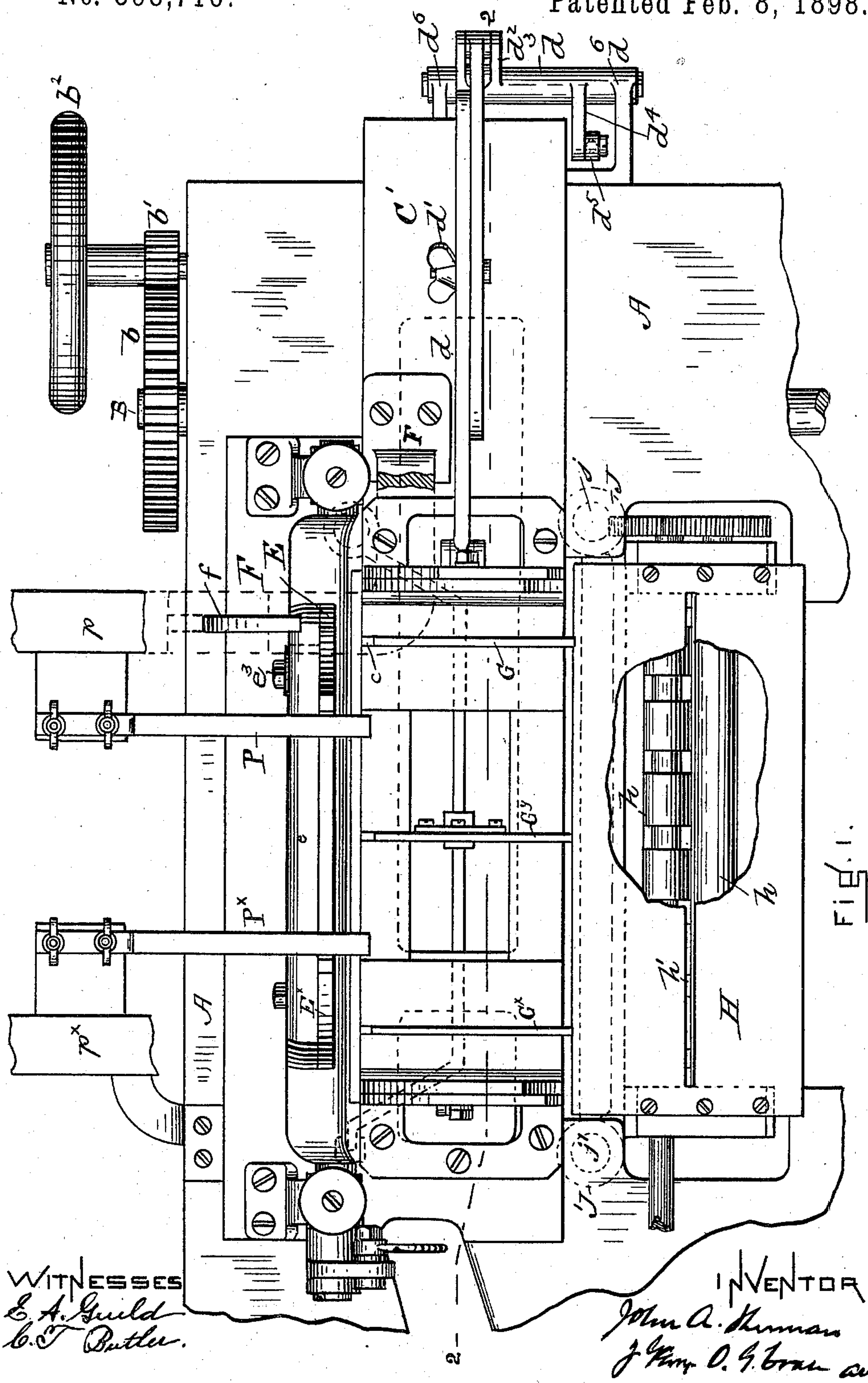
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J. A. SHERMAN.

MECHANISM FOR FOLDING AND SEALING ENVELOPS.

No. 598,716.

Patented Feb. 8, 1898.



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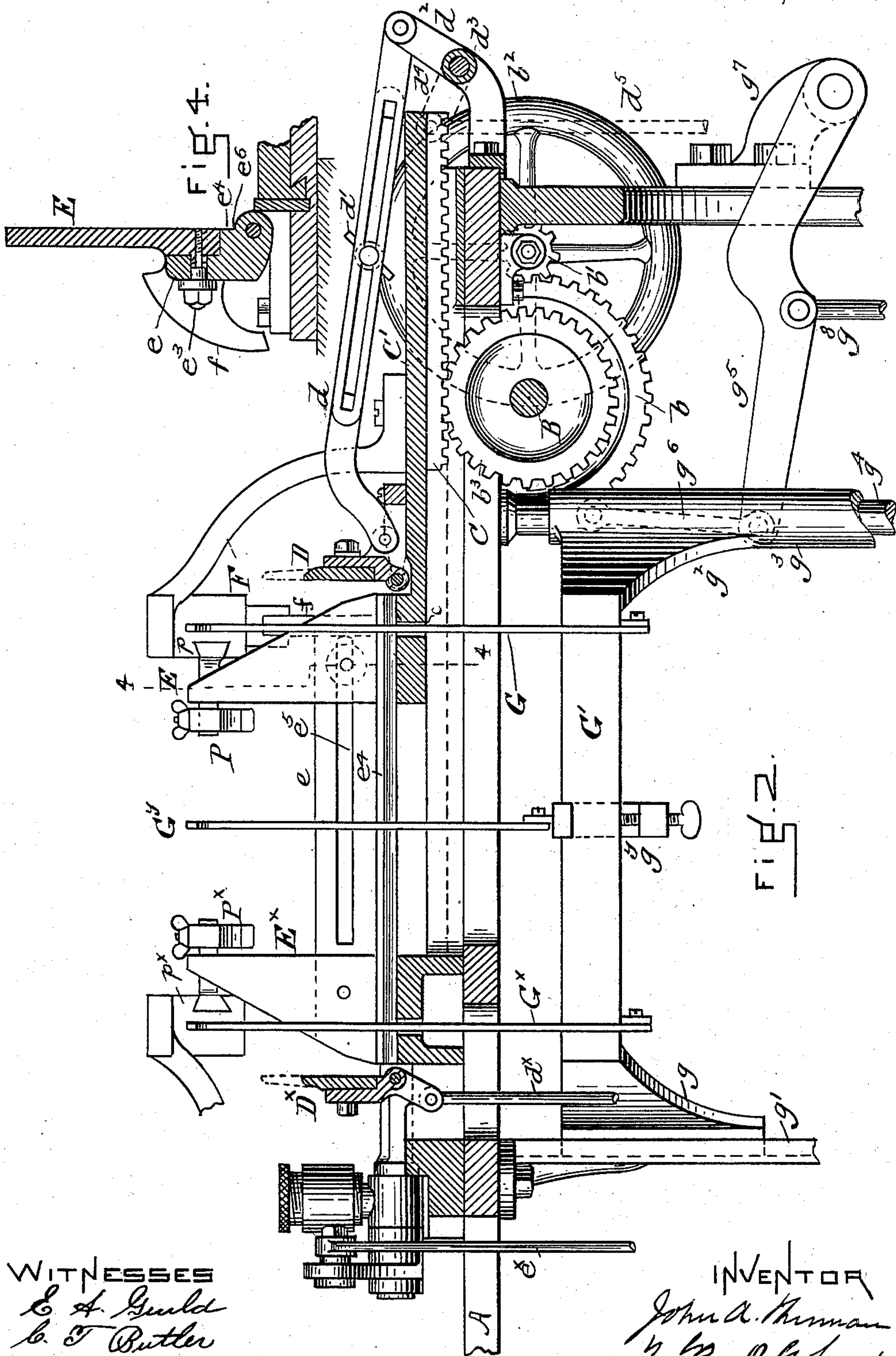
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(No Model.)

4 Sheets—Sheet 3.

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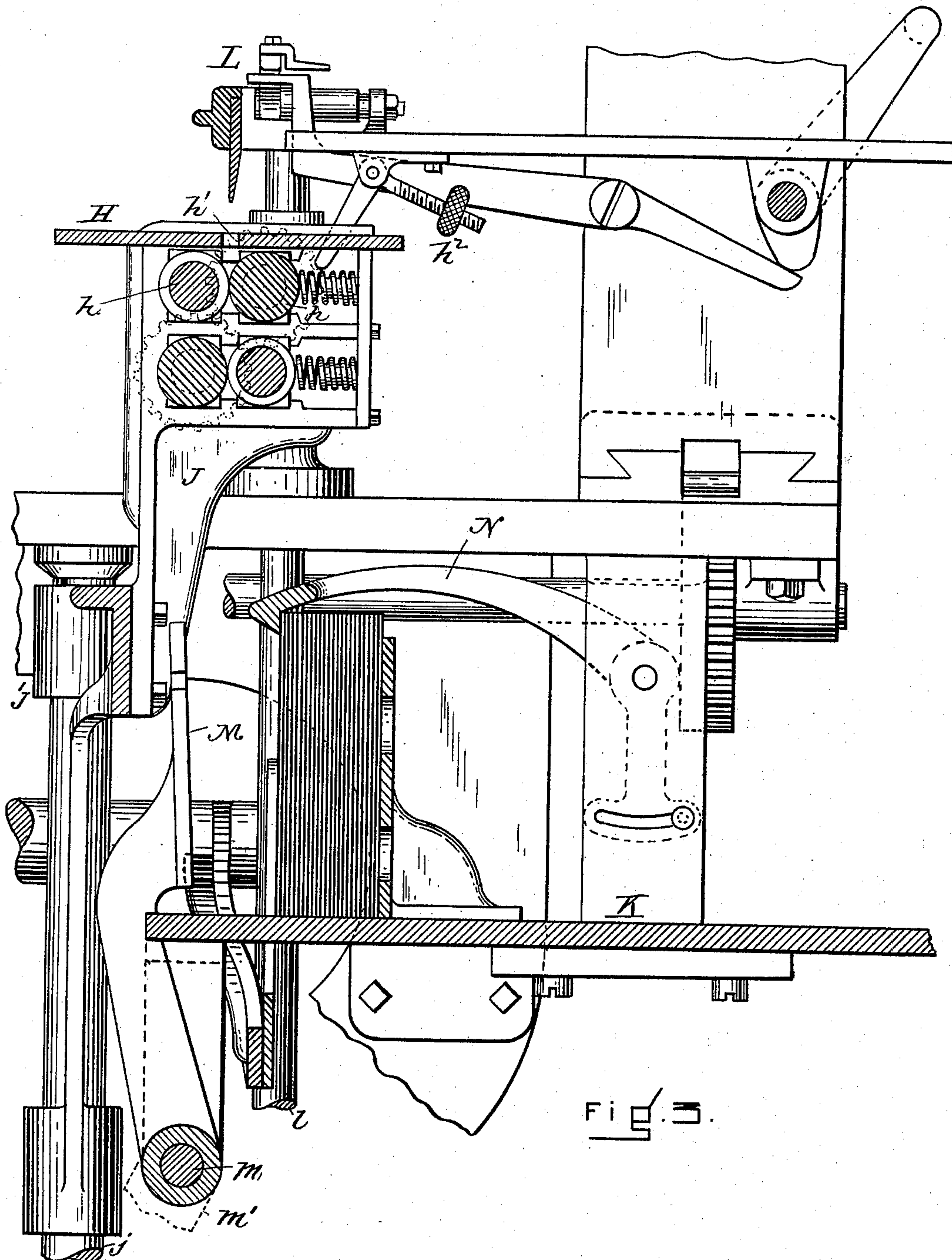


FIG. 3.

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# UNITED STATES PATENT OFFICE.

JOHN A. SHERMAN, OF WORCESTER, MASSACHUSETTS.

## MECHANISM FOR FOLDING AND SEALING ENVELOPS.

SPECIFICATION forming part of Letters Patent No. 598,716, dated February 8, 1898.

Application filed May 20, 1896. Serial No. 592,251. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. SHERMAN, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Mechanisms for Folding and Sealing Envelops, of which the following is a specification.

My invention relates, mainly, to a folding-box which is made adjustable in order to fold envelops of various sizes, this folding-box being especially adapted for use in the manufacture of the larger-sized envelops useful in mailing pamphlets and the like, one flap of which is not gummed.

I have not shown my folding-box applied to a complete envelop-machine, as the mode of application will suggest itself to any one who is conversant with the manufacture of envelop-machines, nor have I indicated in the drawings the mechanism whereby the various movements are given to the various parts, as these movements are many of them common in envelop-machines and the mode of giving them is well known.

In the drawings, Figure 1 is a plan of the folding-box, showing also the plate onto which the folded envelop is placed and through a slot in which the envelop is fed down through suitable rollers which crease the seal-flap and place the envelop on the shelf where the finished envelops are all received. In this view the plate is broken away somewhat to show the rollers and certain of the parts are shown in dotted lines. Fig. 2 is a vertical section on line 2 2 of Fig. 1, and Fig. 3 is a view in section of the fly-flap-folding mechanism and the receptacle for the finished envelops. Fig. 4 is a section on line 4 4 of Fig. 2. Fig. 5 is a vertical section of a machine, showing the relation of the table H and the folding-box with the means for operating them, together with the means for operating the pushers, &c.

A is a portion of a machine, which may be supported in any desired way.

B is a shaft hung just below the table A, carrying a gear  $b$ , which engages with the pinion  $b'$  on a stud, also hung below the table and carrying at its outer end a hand-wheel  $b^2$ . Upon the shaft B is also a second gear  $b^3$ , which engages with the rack C, mounted on the under side of a slide C', which slides in the table A. This slide C' carries one of

the end-folders D, which with the opposite end-folder  $D^x$  and the pressure-folder  $E$   $e$   $E^x$  forms the folding mechanism for making the body of the envelop. It will be understood that this mechanism, as shown, is intended to operate with an envelop-blank in which the back-flap (and possibly one of the end-flaps only) has been gummed in the machine, the seal-flap being free and dry.

The folders  $D^x$  and  $E$   $e$   $E^x$  are operated to perform the folding operation in the manner usual in envelop-machines—namely, by means of connecting-rods  $d^x$   $e^x$ , which may run to and be operated by cams and other like mechanism. The folder D is operated by a link connection  $d$ , adjustable in length and clamped by means of a clamp-screw  $d'$ . This connecting-link runs to a rocker-arm  $d^2$ , mounted on a sleeve  $d^3$ , which carries a second rocker-arm  $d^4$ , connected by a connecting-rod  $d^5$  to the operating mechanism, which gives to it the same movements which are given to the folder  $D^x$ . The sleeve  $d^3$  is supported in two brackets  $d^6$ , which project from the table A. The two wings of the pressure-folder  $E$   $E^x$  are connected by a slotted piece  $e$ , which is mounted in journals and operated in the usual manner of pressure-folders. To the slotted piece  $e$  the part E is clamped by a set-screw  $e^3$ , this part  $e$  being, in fact, the portion which performs the greater part of the folding operation, the parts  $E$   $E^x$  performing, in fact, the sealing operation. The part  $e$  runs the entire length of the folding-box when drawn out to its extreme length, and, in fact, serves when closed over during the folding operation to fold the back-flap, as when in that position it lies close to the bottom of the box, thus compressing the edge of the back-flap for its entire length, no matter what that length may be or what may be the position of the wing E. I prefer to make these parts in the manner indicated in Fig. 4, in which the surface  $e^4$  forms the folding or creasing surface of the folder, the part  $e$  forming the slotted portion to which the wing E is attached, this slotted portion being offset from the creasing-surface  $e^4$  by the thickness of the lower part of the wing E. The corner  $e^6$ , where the so-called "bead" and creasing-surface  $e^4$  join, serves to prevent the envelop from spreading during the folding operation,



thus keeping the envelops all of exactly the same size. The part E is adjusted by moving the bed-piece C', being connected thereto in the following manner:

5 F is an arm, (shown in Figs. 1, 2, and 5,) which is mounted upon the bed-piece C' and extends up and at an angle toward the rear of the machine, being forked at its extremity. In the fork lies a projection  $f$ , mounted on  
10 the back side of the folder E, the groove in the fork and the arm which fits in it being preferably segmental in shape, so as not to interfere with the free operation of the part E during the folding. To adjust the parts,  
15 the said screw  $e^3$  is loosened, and the clamp-screw  $d'$  is also loosened, and by turning the hand-wheel  $b^2$  the bed-piece C' is moved either toward or from the opposite side of the machine, carrying with it the folder D and the  
20 wing E.

G G<sup>x</sup> G<sup>y</sup> are elevators mounted upon a cross-bar G', one end,  $g$ , of which slides on an upright  $g'$ , the other end,  $g^2$ , being mounted upon a sleeve  $g^3$ , which slides on a stud or post  $g^4$ ,  
25 being operated by a lever  $g^5$ , to which it is connected by a link  $g^6$ , the lever being pivoted upon a bracket  $g^7$ . By means of a connecting-rod  $g^8$  the lever  $g^5$  is connected to a cam or other motion, which gives the mechanism a vertically-reciprocating movement.  
30 Where such mechanism as this is used, it is very desirable that these parts shall project, as shown in Fig. 2, when the folding-box is open, to meet the downwardly-moving plunger and support the blank against it as it forces it down into the folding-box. To adjust these elevators to the size of the envelop to correspond with the adjustment of the folding-box, the elevator G<sup>y</sup> is made adjustable  
40 upon the bar G' by a set-screw  $g^y$ , and the elevator G is clamped to a projection from the bar G' by a clamp-screw and passes up through a slot  $c$  in the inner end of the bed-piece C'. The movement of these elevators is preferably then upward to receive the blank which the plunger brings down to it, and then down to leave the blank in the folding-box. The folding operation then takes place in the customary way, and the elevators then rise somewhat in order to lift the envelop out of the  
50 folding-box and place it within reach of a horizontally-pushing mechanism, which is so constructed that the partially-folded envelop will be pushed from the top of these elevators onto the top of a slotted plate H. A pushing mechanism adapted for such purpose has been used in envelop-machines for pushing the blank or envelop from one surface onto another, and such pushers and means  
60 for operating them are well known to those skilled in the art. I have indicated at P P<sup>x</sup> two pushers sliding in standards, one of which is supported upon the table A and the other upon an extension of the arm F, carried by the slide C', so that it will be adjusted as the  
65 slide is adjusted according to the size of the envelop to be folded. These pushers slide

in suitable ways  $p$   $p^x$  and are given the necessary horizontally-reciprocating movement by means of suitable cams in the well-known  
70 manner. (See, for example, Fig. 5, in which the pusher P is connected by a link  $p'$  and the arm  $p^2$ , projecting from the sleeve  $p^3$  on the stud  $p^4$ , mounted on the frame.) A second arm  $p^5$  on the sleeve  $p^3$  is operated by a  
75 cam-rod  $p^6$  and cam  $p^7$  to give the pusher its necessary movements, this mechanism being duplicated upon the other side of the machine. They should be made adjustable, so that their reach will be greater or less, according  
80 to the width of the envelop to be folded.

The slotted plate H is located above two or more rolls  $h$ , these rolls being geared together and so arranged that if the blank is pushed  
85 down through the slot  $h'$  in the plate H it will be seized by the rolls and carried down and deposited upon the shelf K in the manner below described. This plate H is mounted upon a frame J, having hubs J' sliding on rods  $j$ .  
90 One of these hubs and rods only is shown, (see Figs. 3 and 5,) it being understood that a corresponding construction exists at the other end of the rolls, as indicated in Fig. 1. Power may be applied to the rolls  $h$  in any  
95 well-known manner. One manner, for example, would be to provide the shaft of one of the geared rolls with a sprocket carrying a chain which rides over a corresponding sprocket on the cam-shaft, suitable means being also provided—for example, a spring-controlled idler—by which the slack of the chain  
100 shall be taken up during such times as the frame J is not in its upper position. These rolls and plate H are reciprocated vertically by means of suitable cam  $j^2$  on the cam-shaft.  
105  $j^3$  is a lever hung on a cross-rod  $j^4$ , carrying a cam-roll  $j^5$ , resting on said cam  $j^2$  and connected at its farther end by the connecting-rod  $j^6$  to the hub J'. The lowest position of the plate is in the same horizontal plane with  
110 the bottom of the folding-box, so that it will receive the seal-flap of the blank as the blank is forced down by the plunger and will support it during the folding operation. The plate then rises with the elevators until the then  
115 partially folded envelop has been brought opposite the pushers above referred to, when the elevators stop for a moment and the pushers act to push the entire envelop upon the plate and then retire to allow the elevators  
120 to complete their movement upward to meet the new blank which the plunger is bringing down, when they retire again with the plunger and the new blank. The envelop, which has now been gummed and partially folded  
125 and stuck, strikes suitable gages  $h^2$ , which hold the envelop against the ends of the pushers and serve, with them, to locate the envelop properly under the tucking-knife. These gages are balanced angle-arms, one  
130 arm being weighted with a thumb-screw, the position of which can be adjusted so as to locate the other arm at any desired point. Thus the gages are always free to yield, if neces-



sary, and yet are held in a proper predetermined position. This knife L is mounted on a cross-bar attached at each end to a reciprocating rod *l* and is reciprocated vertically, being of sufficient length to fill the entire slot *h'*, (shown in Fig. 1,) and as it reciprocates downward it drives a portion of the envelop on a line which is to form the crease of the seal-flap sufficiently far to cause that portion of the blank to be seized by the rotating rolls *h*, and thus be carried down toward the shelf and in front of an oscillating plate M, mounted on a stud *m* and operated by any well-known mechanism, being connected thereto by an arm *m'*. The knife L may be reciprocated by any well-known means—for example, by means corresponding in character with the means shown for reciprocating the frame J—but its movement should be so regulated with relation to that of the frame J that the tucking-knife will at the proper time, as above described, pass into the slot *h'* and perform its function of tucking the seal-flap, crease and deliver the envelop to the rolls *h*. This oscillating plate on receiving the envelop pushes it forward and under the hook N, which receives it, as will be understood from Fig. 3.

This form of construction of folding-box, it will be evident to all skilled in the art, can be used with any variety of machine for making an open-side or open-end envelop in which the seal-flap is not gummed by the machine; but, as has been indicated, its main purpose is to fold those odd sizes of envelops which are ordinarily folded by hand because the demand is not sufficient to warrant the construction of a number of machines, one for each-sized blank. This folding-box being adjustable can be used with an adjustable gummer and plunger and other such parts, and will be found extremely useful when so combined. The means for operating the various parts are not shown in the drawings because they may be of any well-known construction, and corresponding motions are well known to all skilled in the art of making envelops. It would seem, therefore, that a complete description and illustration of the various cams and connecting-levers would unnecessarily complicate this description, and hence they have been omitted.

So far as the construction of the folding-box is concerned, it will be noticed that the bead or part of the long folder which causes the back-flap to be turned into a plane substantially parallel with the face of the envelop is of constant length, but only so much of it is utilized in any given case as is required by the size of the envelop to be folded. So far as the tucking-knife is concerned, its

function is to complete the work which the folding-box has begun, and it may be used equally well with a non-adjustable folding-box—that is, one of ordinary construction in which the folders will operate to form the pocket of the envelop—the tucking-knife being employed to complete the making of the envelop by making and driving the crease of the seal-flap down between the rolls.

What I claim as my invention is—

1. A folding-box for an envelop-machine having a bead extending along one end of its long side, upon which is mounted a pressure-folder consisting of two wings, one of which is adjustable upon said bead, in combination with an end-folder mounted upon an adjusting-plate and means whereby said folders are operated and may be adjusted together by one operation, as and for the purposes set forth.

2. In the folding-box of an envelop-machine, means for folding and sealing three sides of the blank, said means consisting of oscillating folders of substantially the kind described, and means for folding the seal-flap, consisting of a reciprocating tucking-knife, a slotted table and two or more rolls of substantially the same diameter through their length located beneath said table and adapted to receive and feed said seal-flap and means whereby the blank is carried from said folding-box to said table, all as set forth.

3. A folding mechanism for an envelop-machine consisting of a folding-box of substantially the kind described adapted to fold three sides of said envelop and means for folding the seal-flap of the said envelop consisting of a slotted table and vertically-reciprocating tucking-knife mounted over said table and adapted to reciprocate through the slot therein and a set of rolls of substantially the same diameter throughout their length located under said slot and rotated to withdraw the envelop therefrom, all as set forth.

4. The adjustable folding-box above described, one of the folders in which has a continuous bead running to the longest length of the folding-box and carrying one or more wings adjustably located thereon and adapted to overreach said bead and seal an envelop, whereby the movement of the adjustable wing will cause the shortening or lengthening of the active edge of said bead, as set forth.

In witness whereof I have hereunto set my hand this 14th day of May, 1896.

JOHN A. SHERMAN.

Witnesses:

GEORGE O. G. COALE,  
EVA A. GUILD.