

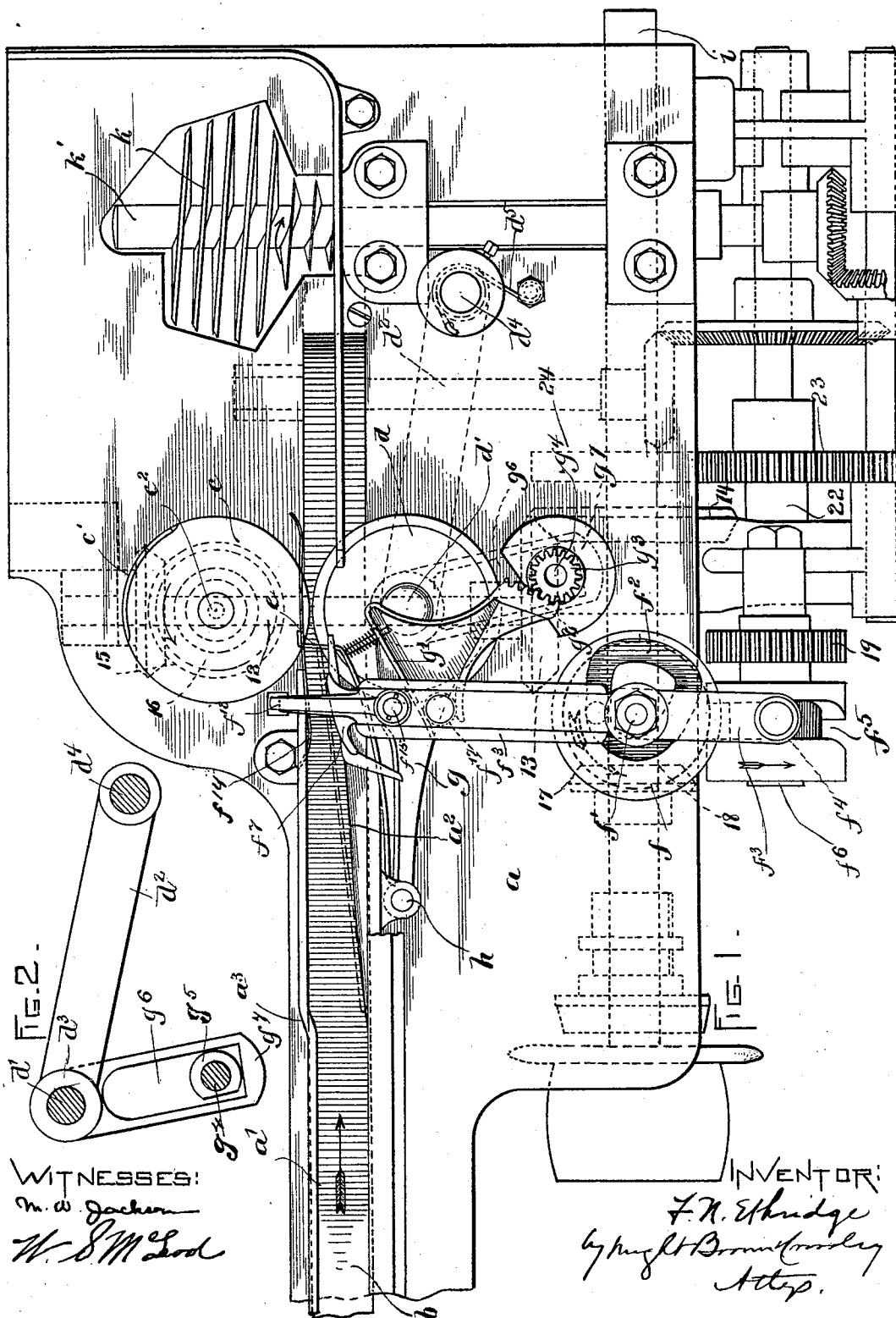
(No Model.)

3 Sheets—Sheet 1.

F. N. ETHRIDGE.
STAMP CANCELING MACHINE.

No. 521,565.

Patented June 19, 1894.



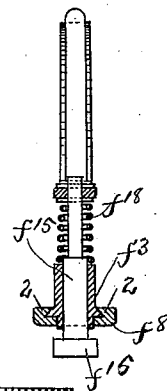
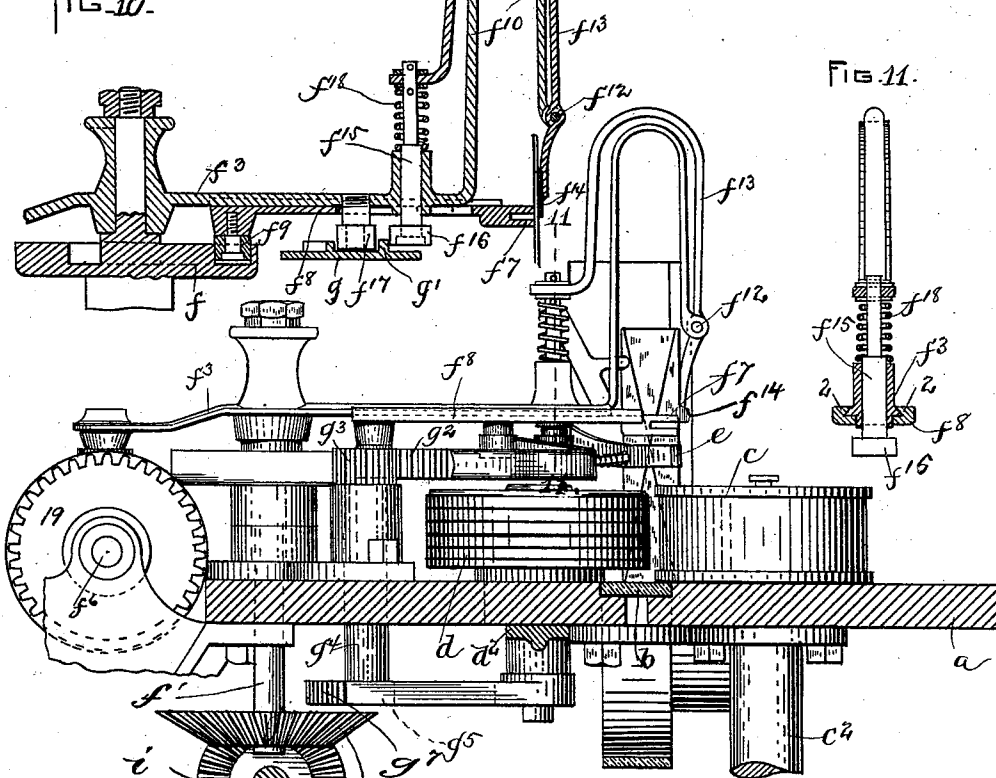
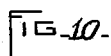
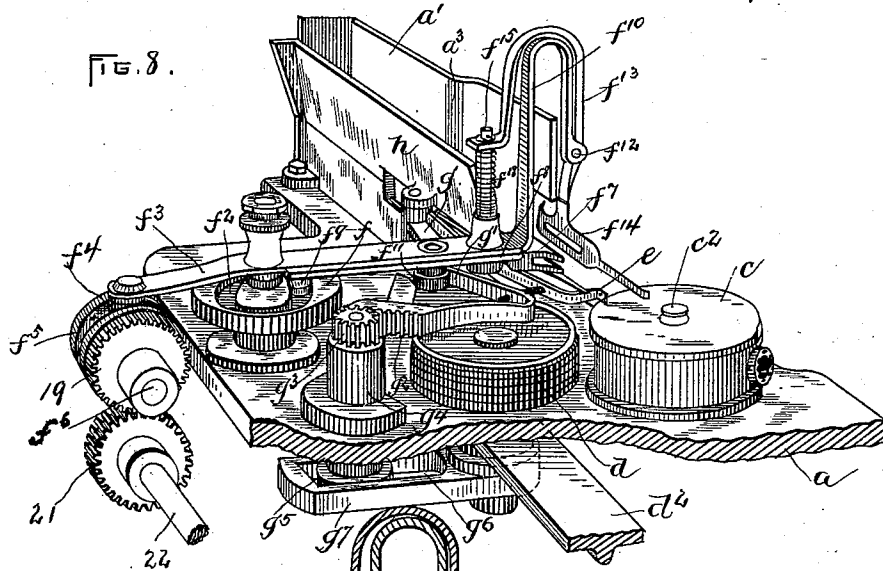
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3. Sheets—Sheet 3.

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WITNESSES:

W. S. MacLeod

INVENTOR:

F. N. Ethridge
by Knight Brown Crowley
Atty.

UNITED STATES PATENT OFFICE.

FRANK N. ETHRIDGE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN POSTAL MACHINES COMPANY, OF MAINE.

STAMP-CANCELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,565, dated June 19, 1894.

Application filed November 5, 1892. Serial No. 451,056. (No model.)

To all whom it may concern:

Be it known that I, FRANK N. ETHRIDGE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stamp-Canceling Machines, of which the following is a specification.

This invention relates to that class of stamp-canceling machines, in which a conveyer, consisting of an endless belt, is employed to move the letters endwise to the point where they are acted on by the die cylinder and an impression-roll co-operating therewith.

The invention has for its chief object to provide means for arresting each letter in its forward movement just before it reaches the printing position, and for releasing the letter and permitting the resumption of its forward movement when the die of the die cylinder is in the proper position.

The invention also has for its object to provide various improvements in the construction of the machine whereby the rapidity of its operation and its general efficiency may be increased.

To these ends, the invention consists in the improvements which I will now proceed to describe.

Of the accompanying drawings, forming part of this specification: Figure 1 represents a top plan view of a stamp-canceling machine embodying my improvements, portions of the machine being broken away. Fig. 2 represents a top view of parts of the mechanism shown in dotted lines in Fig. 1. Fig. 3 represents a top view of a portion of the machine, showing the position of the die cylinder and impression-roll when a letter is being printed. Fig. 4 represents a detached top view of one of the parts shown in Fig. 3. Fig. 5 represents a side view of a portion of the impression-roll and the mechanism that supports the same. Fig. 6 represents a section on line 6—6, Fig. 3. Fig. 7 represents an edge view of the part shown in Fig. 4. Fig. 7^a represents a top view of another of the parts shown in Fig. 3. Fig. 8 represents a perspective view of a portion of the machine. Fig. 9 represents a section on line 9—9, Fig. 3, looking toward the left. Fig. 10 represents a sec-

tion on line 10—10, of Fig. 3. Fig. 11 represents a section on line 11—11 of Fig. 9.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings: *a* represents the supporting-bed or table of the machine, on which is located a horizontal letter-receiving throat *a'*, having at its bottom an endless belt or conveyer *b*, mounted upon pulleys below the table *a*, and driven by any suitable mechanism, the upper portion of the belt being substantially flush with the upper surface of the table *a* and constituting a traveling bottom for the throat *a'*, the movement of the belt being as indicated by the arrow marked thereon in Fig. 1.

c represents the die cylinder, which is provided on its periphery with a printing die, adapted to make the desired impression upon the letter or other piece of mail matter passed through the machine. The die cylinder *c* is affixed to a vertical shaft *c'*, which is rotated by a suitable connection with the driving-shaft of the machine, the said shaft being journaled in fixed bearings.

d represents an impression-roll, which is loosely mounted upon a stud *d'*, and is movable toward and from the periphery of the die cylinder, the means whereby the impression-roll is enabled to move as described being here shown as an arm *d''*, having at one end a bearing *d'''* for the stud *d'*, and affixed at its other end to a vertical stud *d''*, which is adapted to run in a bearing in the table *a*, and is provided with a helical spring *d'''*, one end of which is affixed to a collar on said rod, and the other end to the table, said spring acting to normally press the impression-roll toward the die cylinder, permitting said roll to be moved away from the die cylinder.

Automatic mechanism is provided, as hereinafter described, whereby the impression-roll is normally held out of contact with the periphery of the die cylinder when there is nothing between said die cylinder and the impression-roll, the impression-roll being moved toward the die cylinder and caused to co-operate with the latter in grasping and feeding a letter that is introduced between the impression-roll and die cylinder.

e represents a stop, which acts to arrest each letter at a given point in the throat a' and hold the letter until the impression die on the die cylinder reaches the proper point in its revolution to make an impression upon the letter at the proper distance from its advancing end.

I have provided automatic mechanism, which acts, when the die cylinder reaches the proper position for effecting an impression upon the letter, to first remove the stop from its operative position, and thus permit the letter to advance between the die cylinder and the impression-roll, and then to move the impression-roll toward the die cylinder, and thus cause it to co-operate with the latter in grasping and feeding forward the letter which is at the same time printed by the die cylinder. Said mechanism may be variously modified in construction, and, while my invention is not limited to the particular organization of said mechanism here shown, I will describe the same as the best embodiment of my invention of which I am at present aware.

f represents a disk, formed on a vertical shaft f' , which extends through the table a , said disk having a cam-groove f^2 .

f^3 represents a driver in the form of a lever, which is mounted to oscillate upon the shaft f' , and is provided at one end with a trundle-roll f^4 , engaging a cam-groove f^5 , affixed to a horizontal shaft f^6 , which is journaled in bearings attached to the table a , and is continuously rotated by the power of the machine, through suitable gearing.

f^7 represents a shoe, affixed to a slide f^8 , which is fitted to move lengthwise upon the lever f^3 , said slide having dove-tail ears 2 2, embracing the beveled edges of the lever f^3 , as shown in Fig. 6. The slide f^8 is provided with a trundle-roll f^9 , which enters the cam-groove f^2 . One end of the lever f^3 is provided with an arched standard or goose-neck f^{10} , which extends across the space through which the letters pass in emerging from the throat a' , each letter passing through the arch formed by the standard f^{10} . To said standard is pivoted at f^{12} a curved lever f^{13} , having at one end a plate f^{14} , arranged opposite the shoe f^7 , the other end of the lever f^{13} being loosely connected with a stud f^{15} , which is vertically movable in a bearing formed on the lever f^3 , and has at its lower end a trundle-roll f^{16} (Fig. 10).

The letter-stop e is supported by an arm or lever g , which is pivoted at h to fixed supporting ears, and is adapted to swing horizontally. The lever g is provided with a rib or flange g' on its upper side, adapted to be engaged as hereinafter described with the trundle-roll f^{16} , said trundle-roll giving the lever g a motion in one direction when the lever f^3 is moved in the direction indicated by the arrow in Fig. 3. The lever f^3 is provided with a trundle-roll f^{17} (Fig. 10), which bears on the opposite side of the rib g' , and gives another movement to the lever g when the lever f^3 is

moved in the opposite direction. The trundle-roll f^{16} is normally held by a spring f^{18} in an elevated position, out of engagement with the rib g' , and is depressed into position to engage said rib by the outward pressure of the shoe f^7 upon a letter interposed between said shoe and the plate f^{14} when said shoe is moved outwardly or toward the die cylinder. There is therefore no movement of the lever g and of the letter-stop e supported by said lever, until a letter comes between the shoe f^7 and plate f^{14} . The lever g is provided with a rack segment g^2 , which meshes with a pinion g^3 affixed to a vertical shaft g^4 , which is journaled in a fixed bearing on the table a , and has at its lower end a cam g^5 (Figs. 2 and 8), which is located in a slot g^6 in an arm g^7 , affixed to the arm or lever d^2 which supports the impression-roll d . The office of said cam g^5 is to alternately hold the impression-roll away from the die cylinder, which it accomplishes by bearing on the outer end of the slot g^6 , and permit the impression-roll to move toward the die cylinder, which it accomplishes by receding from the outer end of said slot.

The operation of the mechanism above described is as follows: The letters are dropped into the throat a' edgewise by an attendant, and each letter is carried forward endwise by the belt b toward the stop e . Said stop, being normally projected across the path in which the letters are advanced on their way to the acting portions of the die cylinder and impression-roll, arrests each letter before it can reach the die cylinder. The shoe f^7 is given a regular back and forth motion toward and from the plate f^{14} , by means of the cam-groove f^2 and slide f^8 , the movements of said shoe being timed, so that the shoe moves forward and presses the letter against the trundle-roll-depressing plate f^{14} just as the die on the die cylinder is approaching its operative position. The pressure of the letter against the plate f^{14} causes the depression of the trundle-roll f^{16} through the lever f^{13} , as above described. At the same time, the lever f^3 is moved in the direction indicated by the arrow in Fig. 3, by means of the cam-groove f^5 , said motion causing the shoe and plate, which now grasp the letter, to move the letter positively forward between the die cylinder and impression-roll, and at the same time causing the depressed trundle-roll f^{16} to act on the rib g' , and thus move the lever g and the letter-stop e away from the die cylinder, as shown in Fig. 3, said stop being therefore removed from the path of the letter at the same time that the letter is moved forward by the shoe f^7 and plate f^{14} . The same movement of the lever g causes its rack segment g^2 to rotate the shaft g^4 and cam g^5 sufficiently to cause the movement of the impression-roll toward the die cylinder, as above described, said movement occurring so that the letter is grasped by the impression-roll and the die cylinder just as it reaches a point in line with the axes of said

roll and cylinder. The impression roll remains in its forward position until it has co-operated with the die cylinder in feeding the letter out from between the impression roll and die cylinder, after which the lever *g* and letter-stop *e* are returned to the positions shown in Fig. 1, and the impression-roll is withdrawn from the die cylinder by the action of the cam *g*⁵ on the outer end of the slot *g*⁶. It will be seen, therefore, that each letter is timed as to its entrance between the impression-roll and die cylinder by a stop, which is normally projected across the letter path, and is withdrawn automatically when the die of the die cylinder has reached the proper position for making its impression upon the letter, the letter being positively moved forward and presented to the die cylinder and impression-roll just as said parts come together to grasp the letter. It will also be seen that the impression-roll will not approach the die cylinder unless caused to do so by the approach of a letter; hence there is no liability of the impression-roll being in- kered by contact with the die cylinder when there is nothing between said roll and die cylinder.

The shoe *f*⁷, as already stated, is continuously oscillated, and at the same time moved continuously toward and from the letter path by the power of the machine, and is timed so that it moves toward the letter path just as the die is approaching its printing position. Said shoe and the mechanism that operates it therefore constitute a continuously-operating part or division of a two-part mechanism for displacing the letter-stop *e*, the other part or division of said mechanism comprising the plate *f*¹⁴, the trundle-roll *f*¹⁶, and the connections between said plate and trundle-roll whereby the trundle-roll is engaged with a part of the first-mentioned division of the operating mechanism when a letter is arrested by the stop.

It is obvious that a two-part mechanism otherwise organized and having one part continuously operated by the power of the machine and the other part made operative through the agency of a letter, may be substituted for the mechanism here shown without departing from the spirit of my invention.

The throat or hopper *a*¹ is provided at one side with an inclined or diagonal wall *a*², which is arranged to deflect the forward end of a letter, and throw said end over toward the die cylinder. The opposite side of the throat or hopper is offset at *a*³, the offset portion being intended to receive the rear end of the letter, when the same is thrown over by the forward movement of the shoe *f*⁷, whereby a following letter is prevented from entering between the offset side of the throat and the preceding letter.

By providing an automatically-operated stop, and means for displacing each letter sidewise when it reaches said stop, I am enabled to drive the carrying belt *b* at a much more rapid rate than has been feasible heretofore, it being found practicable to drive the

carrying belt at a speed of say twice that of the periphery of the die cylinder. The carrying belt is located on pulleys, which are independent of the die cylinder and impression-roll excepting as they are connected in common with the die cylinder with the driving-shaft of the machine.

i represents the driving-shaft, which is journaled in bearings below the table *a*, and gives motion to the die cylinder, the cam *f*² and the cam *f*³ through suitable connections, said connections being mainly shown in dotted lines in Fig. 1. The connections between the driving-shaft and the die cylinder comprise a shaft 12, having at one end a bevel gear 13, meshing with a bevel gear 14 on the driving-shaft, and at the other end a bevel gear 15, meshing with a bevel gear 16 on the shaft of the die cylinder. The connections between the cam *f*² and the driving-shaft comprise the bevel gear 17 on the driving-shaft, meshing with a bevel gear 18 affixed to the shaft *f*¹. The connections between the driving-shaft and the cam *f*³ comprise a gear 19, affixed to the shaft *f*⁶ which supports said cam, a gear 21 (Fig. 8) meshing with the gear 19 and affixed to a shaft 22, and gears 23 24, affixed respectively to the shaft 22 and the driving-shaft *i*.

The letters may be delivered to a packing device, composed of a helical blade *k*, affixed to a shaft *k*¹, which is journaled in bearings on the table *a* and may be rotated by any suitable connections with the driving-shaft, said packing device being shown and claimed in Letters Patent already granted to me.

I claim—

1. In a stamp-canceling machine, the combination of a die cylinder connected with the driving mechanism of the machine, an impression roll, a letter-conveyer, a movable letter-arresting stop standing normally in the letter path, reciprocating actuating means timed with respect to the die-cylinder, and means controlled by the passing letter for operatively connecting the said reciprocating actuating means and the movable stop whereby the latter is withdrawn from the path of the letter.

2. In a stamp-canceling machine, the combination of a die cylinder connected with the driving mechanism of the machine, an impression roll, a letter-conveyer, a movable letter-arresting stop standing normally in the letter-path, a driver reciprocating in the direction of the letter-path, a shoe carried by said driver and reciprocating in a direction transverse to the letter-path, and connecting means between the driver and the stop which are rendered operative by the reciprocating shoe through the medium of the letter.

3. In a stamp-canceling-machine, the combination of a die cylinder connected with the driving mechanism of the machine, an impression roll movable toward and from the die-cylinder, and yieldingly actuated toward the same a movable letter-arresting stop

standing normally in the letter-path, letter-controlled means timed with respect to the die-cylinder for withdrawing the stop from the letter-path, and connecting devices between the said means and the impression roll normally holding the latter away from the die-cylinder and when the stop is withdrawn permitting the said roll to move toward the die-cylinder.

4. In a stamp-canceling machine, the combination of a die cylinder, a letter conveyer, a letter stop normally in the letter path, a letter-receiving throat having an offset in one side at the end next the die cylinder, a shoe movable into and out of the throat, and operating mechanism therefor timed to cause said shoe to move a letter into said offset and prevent the entrance of a succeeding letter into the offset portion of the throat until after the release of the last arrested letter, and mechanism controlled by an arrested letter whereby the stop is withdrawn when the printing die reaches a predetermined point in its rotation, as set forth.

5. In a stamp-canceling machine, the combination of the die cylinder, the impression roll, the conveyer, the letter stop, the movable carrier for said stop having a rib or flange, the oscillating lever having a roll bearing continuously on one side of said rib, the letter-displacing shoe or presser, the coupling device comprising a plate arranged to be moved by said presser only through the medium of an interposed letter, a trundle-roll or stud on said motor connected with said plate and normally raised out of contact with the rib on the stop-carrier, said roll or stud being movable into engagement with said rib by the action of a letter on said plate, and

connections between the driving shaft of the machine and the said die cylinder, motor and letter presser whereby the movements of said parts are definitely timed, as set forth.

6. In a stamp-canceling machine, the combination of the die cylinder, the impression roll yieldingly pressed toward the die cylinder, the conveyer, the letter stop, the movable carrier for said stop having a rib or flange, the oscillating lever having a roll bearing continuously on one side of said rib, the letter-displacing shoe or presser, the coupling device comprising a plate arranged to be moved by said presser only through the medium of an interposed letter, a trundle-roll or stud on said motor connected with said plate and normally raised out of contact with the rib on the stop carrier, said roll or stud being movable into engagement with said rib by the action of a letter on said plate, an impression-roll-displacing device which is caused by the stop-carrier to hold the impression roll away from the die cylinder when the letter stop is in its normal position and permits the said roll to approach the die cylinder when the stop is displaced, and connections between the driving-shaft of the machine and the said die cylinder, motor and letter presser whereby the movements of said parts are definitely timed, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of June, A. D. 1892.

FRANK N. ETHRIDGE.

Witnesses:

C. F. BROWN,
M. W. JACKSON.