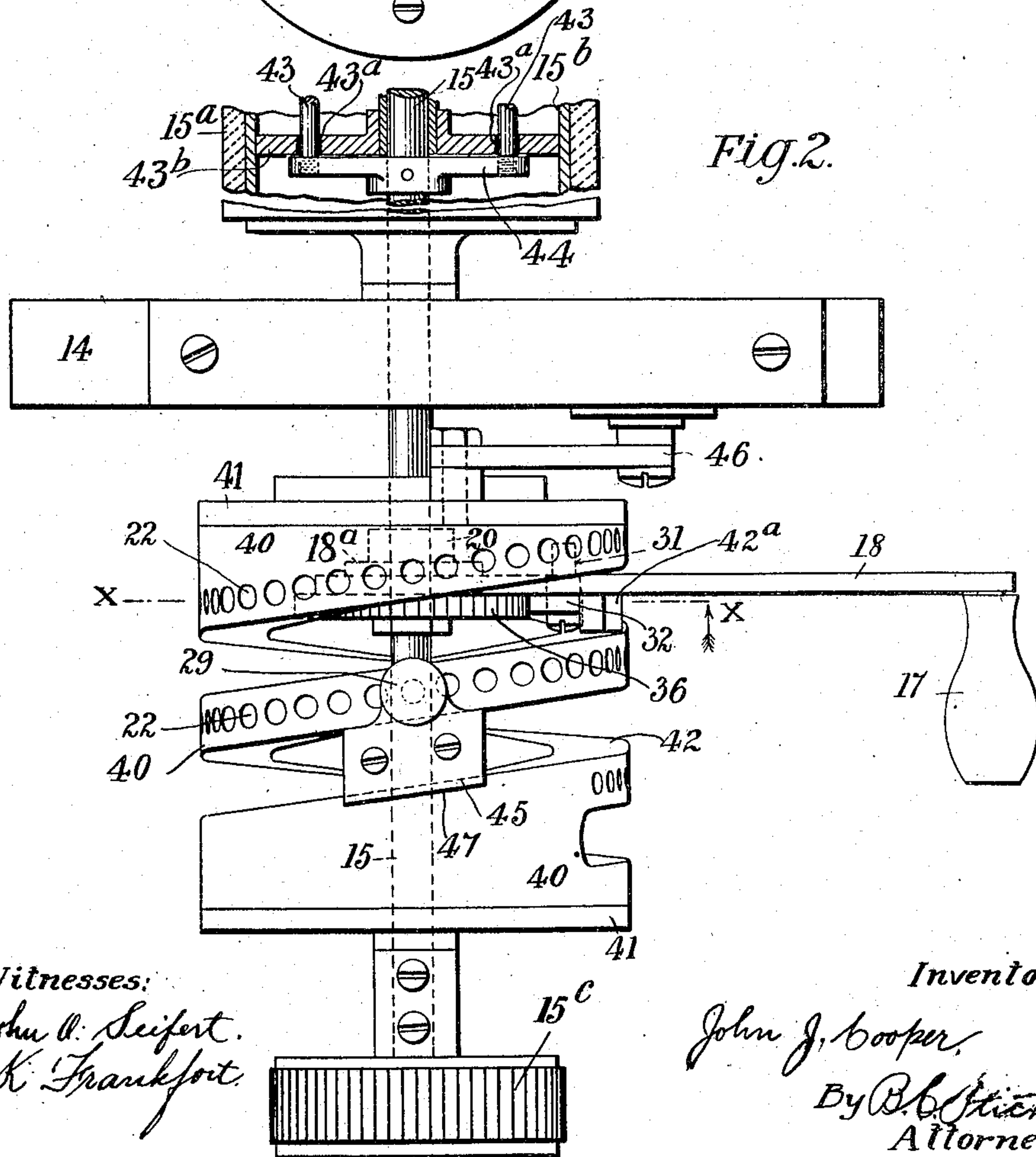
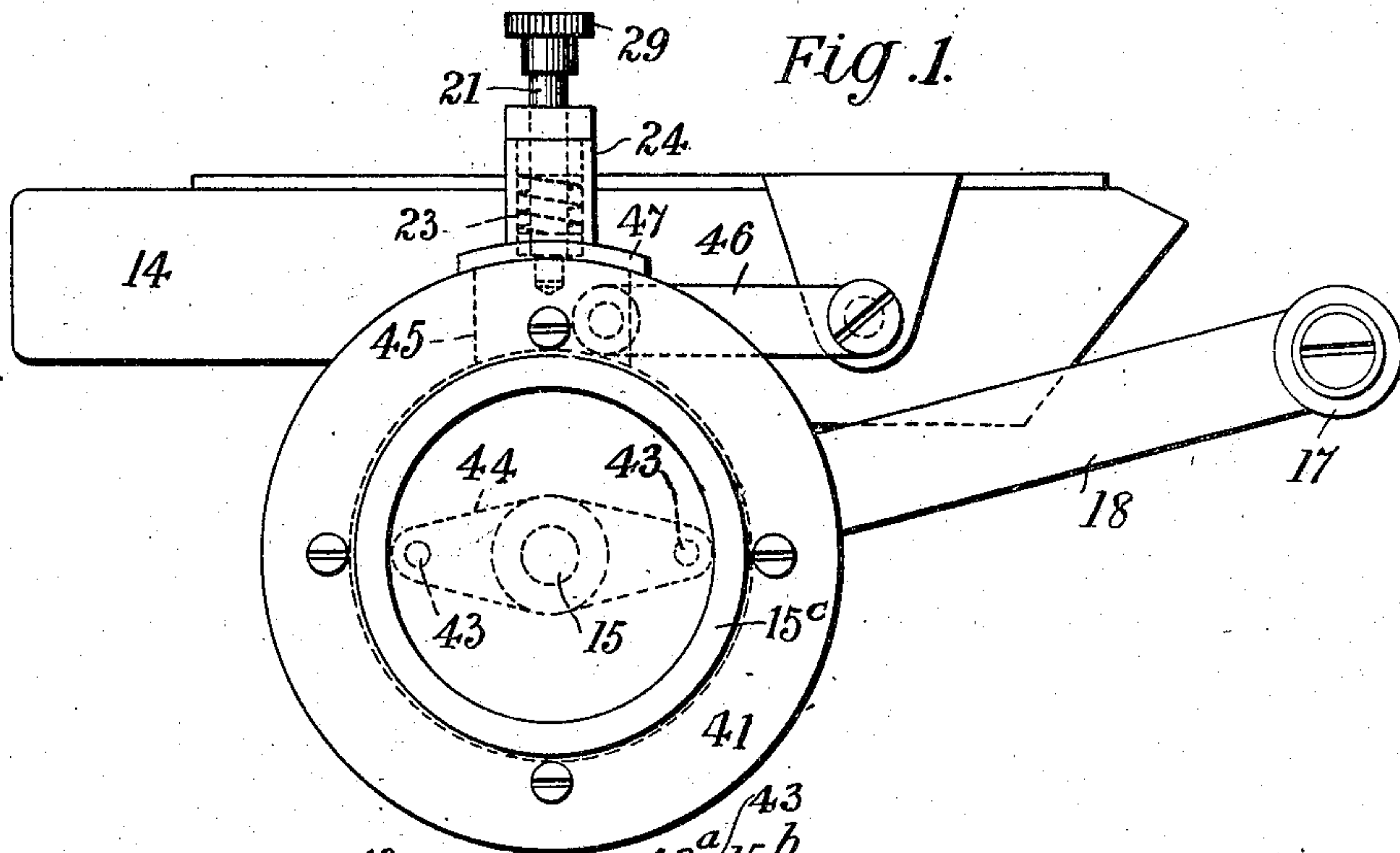


J. J. COOPER.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 30, 1909.

930,730.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.



Witnesses:
John O. Seifert.
K. Frankfort.

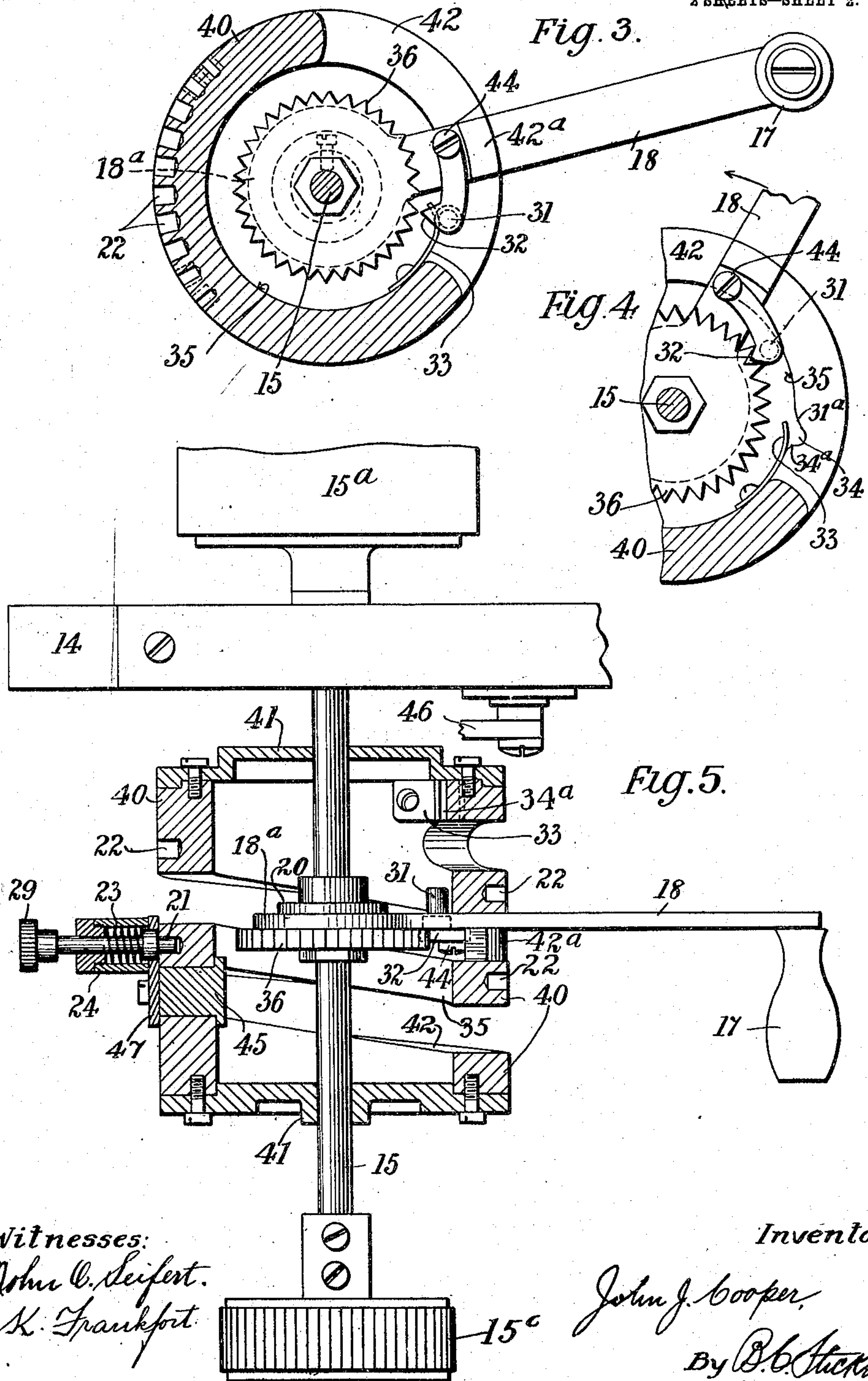
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John J. Cooper.
By R. B. Stickney,
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Inventor:

John J. Cooper,
By B. B. Hickney,
Attorney.

UNITED STATES PATENT OFFICE.

JOHN JOSEPH COOPER, OF LONDON, ENGLAND, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 930,730.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed April 30, 1909. Serial No. 493,077.

To all whom it may concern:

Be it known that I, JOHN JOSEPH COOPER, a subject of the King of Great Britain, residing in the city of London, England, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to typewriting machines which are especially constructed to facilitate the writing of bills and simultaneously recording them in a manner commonly known as "condensed charging".

Provisional application for Letters Patent in Great Britain on this invention was filed July 21, 1908, No. 15,441 of 1908, and complete specification was filed thereon January 21, 1909.

By means of the usual condensed billing attachment, the rotary platen of the typewriter, after one bill has been written and withdrawn, may be given an idle backward rotation to an extent corresponding to the depth of the printed heading on the bill; and after the subsequent insertion of a fresh bill, the platen may be turned forwardly to bring it to position for writing the first line on the bill; whereby the carbon copies of the successive bills are written in close order upon the long record sheet, which remains in the machine. This special backward and forward rotation of the platen is usually effected by a crank, which rotates about the platen axis, playing between stops provided upon the platen frame. The rotation of this crank is limited to a little less than an entire revolution; but in practice this is found sufficient for ordinary bill heads.

Where the depth of the printed portion of the bill head exceeds the circumference of the platen, and it is consequently necessary for the platen to turn backwardly more than an entire revolution at a single stroke, it has been proposed to employ movement-multiplying gearing between the crank and the platen, so that a stroke of the crank through less than an entire revolution will turn the platen through more than an entire revolution.

One of the principal objects of the present invention is to provide simple and effective means for the rotation of the platen-driving crank itself, through more than an entire revolution at one stroke, so that it may be connected directly to the platen, thus avoiding the necessity of employing gearing; and

to provide relatively adjustable stops for limiting the throw of the crank.

In carrying out the invention, provision is made for guiding the crank by means of a helically slotted drum, said drum fixed to the platen frame and inclosing the platen axle, and said crank projecting out through the slot. The axle and crank are movable in the direction of the platen axis, so that as the crank is revolved it may also be guided in axial direction, and may turn either less or more than an entire revolution before it is arrested by a stop which is adjustable along the helical slot.

The crank is normally disconnected from the platen, and is provided with a pawl or dog, which, at the beginning of the movement of the crank, is thrown into engagement with a notched wheel that is fixed to the platen axle; such engagement being maintained mechanically throughout the stroke of the crank and during the return of the same to initial position. The wheel moves axially with the crank and platen axle, the latter splined to the platen to accommodate such movement. It will be understood that the provision of the helical guide permits the crank to turn more than an entire revolution at one stroke before encountering the stop, or in other words, the crank is enabled, during its first revolution, to pass by said stop; while the latter may be also adjusted along the helical guiding slot to limit the crank stroke to less than an entire revolution, at will.

In the accompanying drawings, Figure 1 is an end elevation of the platen frame of an Underwood front strike writing machine, showing the present improvements applied thereto; the platen-rotating crank shown in its normal position. Fig. 2 is a plan of the mechanism seen at Fig. 1, and illustrating in section the splined connection of the platen axle to the platen. Fig. 3 is a cross section taken at about the line *x-x* of Fig. 2, the crank being seen disconnected from the platen. Fig. 4 is a fragmentary view similar to Fig. 3, but showing the crank connected to the platen. Fig. 5 is a sectional plan showing the crank in position about midway between normal position and the adjustable crank stop.

Only one end of the platen frame 14 is shown, said frame being of well known construction. In said frame is rotatably mounted

ed an axle 15 for a platen 15^a provided with the usual core 15^b. The axle and platen are rotatable at any time by means of the usual thumb-wheel 15^c fixed on the end of the platen axle. Special rotation of the platen for purposes of billing is effected by pulling a handle 17 provided upon a crank 18.

The crank hub 18^a is loosely confined between a collar 20 and a notched or toothed wheel 36, both fixed upon the axle 15; the crank being rotatable relatively to the wheel, but both wheel and crank being movable together with the axle 15 endwise of the latter. Upon the crank is pivoted at 44 a pawl having a tooth 32, normally held out of engagement with the wheel, as at Fig. 3, by means of a spring clip 33, which presses a pin or projection 31, provided on said pawl, into a notch 34 formed in the internal periphery 35 of a fixed drum 40. Said drum has at its ends heads 41 fitting loosely upon the platen axle 15; and it is connected by a link 46 to the platen frame end 14 to prevent rotation of the drum. The drum incloses the wheel 36; and the crank 18 projects out through the helical slot 42 formed in the body of the drum. This slot guides the crank as the latter is rotated, and causes it to follow a helical path. Where the width of the slot is great, a block 42^a may be fixed upon the crank, to fill the space between the walls of the slot.

At the beginning of the forward movement of the crank from the position at Fig. 3, the projection 31 of the pawl rides along the cam face 31^a formed in the wall 35, and is forced by said cam face inwardly toward the axle 15, and thereby the pawl or dog tooth 32 is forced into engagement with one of the notches in the wheel 36. During the subsequent turning of the platen, the pawl pin 31 rides along that portion of the inner wall 35 which borders on the helical slot 42 and forms a guide for maintaining engagement of the pawl with the wheel. The crank is thus held connected to the platen until the crank returns to initial position, when the spring 33 intercepts the pawl pin 31 and snaps the latter up into the notch 34, thus disconnecting the pawl from the wheel; the wall 34^a of said notch forming an abutment or stop to determine the initial position of the crank 18. The axle is splined to the platen by means of pins 43 carried upon a cross-arm 44 which is fixed to the platen axle; said pins fitting in perforations 43^a provided in a head or disk 43^b, which is attached to the platen core 15^b, Fig. 2. The movement of the crank 18 away from initial position is limited by a stop 45, fitted in the helical slot 42 and adjustable therealong to limit the stroke of the crank to either less or more than an entire revolution. Attached to the stop is a plate 47, which carries a pin 21 to fit in any

one of a series of perforations 22 formed in the periphery of the drum along the edge of the helical slot 42; the portion of the drum which is provided with these perforations constituting a helical rack. A spring 23 carried in a housing 24 presses the pin 21 into any selected opening or notch 22; and at any time, a button 29 provided upon the pin may be employed to pull out the pin and set the stop to a different position along the helical slot. The perforations 22 are located at angular intervals agreeing with the pitch of the teeth to the wheel 36; said wheel having the same number of teeth as the line-space wheel (not shown), which forms a part of the usual line-spacing mechanism for the platen. Thus it will be seen that the crank 18 may swing freely in the helical slot between the stops 34^a and 45, each stroke of the crank being, if desired, much greater than an entire revolution; the endwise play of the axle 15 accommodating the helical movement of the crank and wheel 36, and the helical movement of the crank enabling it to pass once by the stop 45, whereby it is subsequently arrested. On returning, the helical course of the crank enables it to pass once by the stop 34^a (see Fig. 5) by which it is finally arrested.

Variations may be resorted to within the scope of the invention.

Having thus described my invention, I claim:

1. The combination with a revoluble platen, a crank for rotating the platen, and a stop to determine the normal position of said crank, of a second stop adjustable relatively to the first to limit the stroke of said crank to either more or less than an entire revolution at will; said second stop adjustable about the axis of rotation of said crank, in the path of the latter.

2. The combination with a revoluble platen, of a crank normally disconnected from the platen, means to connect the crank to the platen and maintain such connection during more than an entire revolution of said crank at one stroke from normal position; and a stop adjustable to limit the stroke of said crank to either more or less than an entire revolution at will.

3. The combination with a revoluble platen, of a crank normally disconnected from the platen, means to connect the crank to the platen and maintain such connection during more than an entire revolution of said crank at one stroke from normal position and also during the movement of said crank back to normal position, and a stop adjustable to limit the stroke of said crank to either more or less than an entire revolution at will.

4. The combination with a revoluble platen, of a toothed wheel connected thereto, a crank rotatable about the platen axis but normally disconnected from the toothed wheel and

platen, means to connect said crank to the toothed wheel and maintain such connection through more than an entire revolution of the crank, and a stop adjustable to limit the stroke of the crank to either more or less than an entire revolution at will.

5. The combination with a revoluble platen, of a toothed wheel connected thereto, a crank rotatable about the platen axis but normally disconnected from the toothed wheel and platen, means to connect said crank to the toothed wheel and maintain such connection mechanically through more than an entire revolution of the crank from normal position and also through the movement of the crank back to normal position, a stop adjustable to limit the stroke of the crank through either more or less than an entire revolution at will, and means to disconnect the crank from the toothed wheel upon the return of the crank to normal position.

6. The combination with a platen and a platen frame, of a crank for rotating the platen, a stop adjustable to limit the stroke of the crank to either less or more than an entire revolution at will, and a guide for said crank, said guide constructed to permit the crank to pass said stop during the first revolution of the crank.

7. The combination with a platen and a platen frame, of a crank for rotating the platen, a stop for the crank, and a guide constructed to guide the crank past said stop during one revolution and into engagement with said stop during the subsequent revolution.

8. The combination with a platen, of a crank for rotating the platen, a stop for said crank, and a coiled rack along which said stop is adjustable to limit the stroke of the crank to either less or more than an entire revolution at will.

9. The combination with a platen and a platen frame, of a crank connected to the platen and movable in the direction of the platen axis, a helical guide for said crank, and a crank-stop adjustable along said helical guide.

10. The combination with a platen, of a crank connected thereto, a helical guide for said crank, a stop for said crank, and a helical rack along which said stop is adjustable.

11. The combination with a platen and a platen frame, of an axle splined to the platen, a crank fixed upon said axle, a helical guide fixed upon the platen frame around said axle for guiding said crank, and a stop for said crank, said stop adjustable along said helical guide.

12. The combination with a platen and a platen frame, of a crank connected to the platen and movable in the direction of the platen axis, a helical guide for said crank, a crank-stop adjustable along said helical guide, a wheel connected to the platen and

movable axially together with said crank, a pawl connected to the crank for engagement with said wheel, and means to hold the pawl in engagement with the wheel while the crank turns helically to and fro.

13. The combination with a platen and a platen frame, of a crank connected to the platen and movable in the direction of the platen axis, a helical guide for said crank, a crank-stop adjustable along said helical guide, a wheel connected to the platen and movable axially together with said crank, a pawl connected to the crank for engagement with said wheel, means to hold the pawl in engagement with the wheel while the crank turns helically to and fro, and means for effecting disconnection of the crank from the wheel upon the return of the crank to initial position.

14. The combination with a platen and a platen frame, of a toothed wheel connected to the platen and movable axially thereof, a crank, a pawl upon said crank to engage said toothed wheel, said crank movable together with said wheel along the platen axle, a helical guide for said crank, and a crank-stop adjustable along said helical guide.

15. The combination with a platen and a platen frame, of a toothed wheel connected to the platen and movable axially thereof, a crank, a pawl upon said crank to engage said toothed wheel, said crank movable together with said wheel along the platen axle, a helical guide for said crank, and a crank-stop adjustable along said helical guide; said pawl having a projection to run upon an inner periphery of the helical guide, to maintain the engagement of the pawl with the wheel.

16. The combination with a platen and a platen frame, of a toothed wheel connected to the platen and movable axially thereof, a crank, a pawl upon said crank to engage said toothed wheel, said crank movable together with said wheel along the platen axle, a helical guide for said crank, and a crank-stop adjustable along said helical guide; said pawl having a projection to run upon an inner periphery of the helical guide, to maintain the engagement of the pawl with the wheel; said helical guide in the form of a drum confining said pawl, and having a notch into which said projection is pressed by a spring upon the return of the crank to initial position, whereby the pawl is disengaged from the wheel and the crank is arrested.

17. The combination with a platen and a platen frame, of an axle splined to the platen, a notched wheel fixed upon said axle, a crank loose upon said axle but confined to move axially therewith, a pawl or dog upon said crank normally out of engagement with said wheel but movable into engagement therewith, a drum fixed to the platen frame

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and having a helical slot through which said crank projects and whereby it is guided, said pawl having a projection to run upon the inner periphery of said drum at said slot, 5 to maintain the pawl in engagement with said wheel, and a stop for the crank.

18. The combination with a platen and a platen frame, of an axle splined to the platen, a notched wheel fixed upon said axle, 10 a crank loose upon said axle but confined to move axially therewith, a pawl or dog upon said crank normally out of engagement with said wheel but movable into engagement therewith, a drum fixed to the platen frame 15 and having a helical slot through which said crank projects and whereby it is guided, said

pawl having a projection to run upon the inner periphery of said drum at said slot, to maintain the pawl in engagement with said wheel, a helical series of openings being pro- 20 vided along said drum adjacent to said slot, and a stop in said slot and having a locating pin to engage any of said openings, for arresting said crank and platen at a prede- 25 termined point either before or after the crank turns the platen through an entire revolution at one stroke.

JOHN JOSEPH COOPER.

Witnesses:

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F. L. RAND.