

(No Model.)

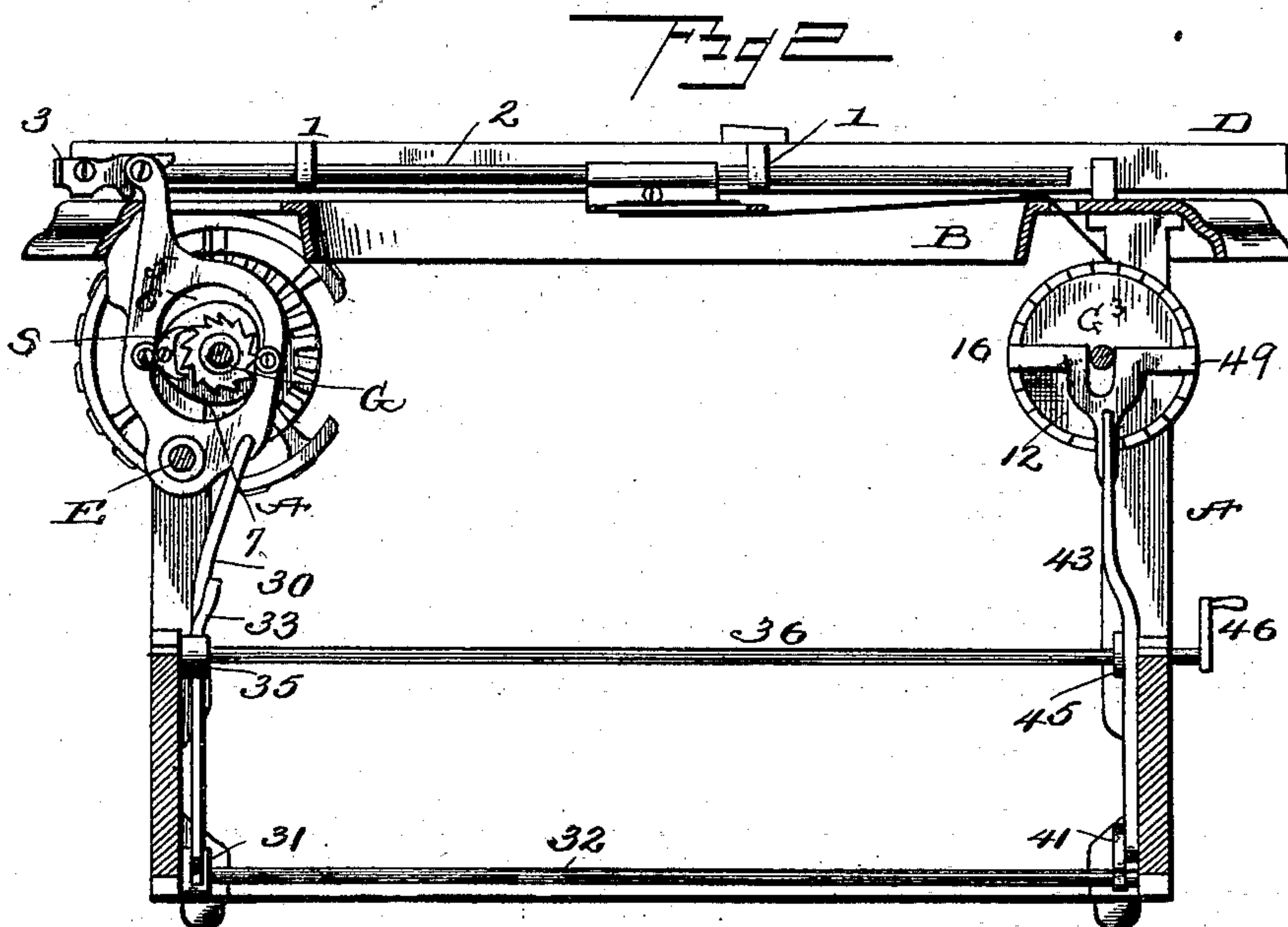
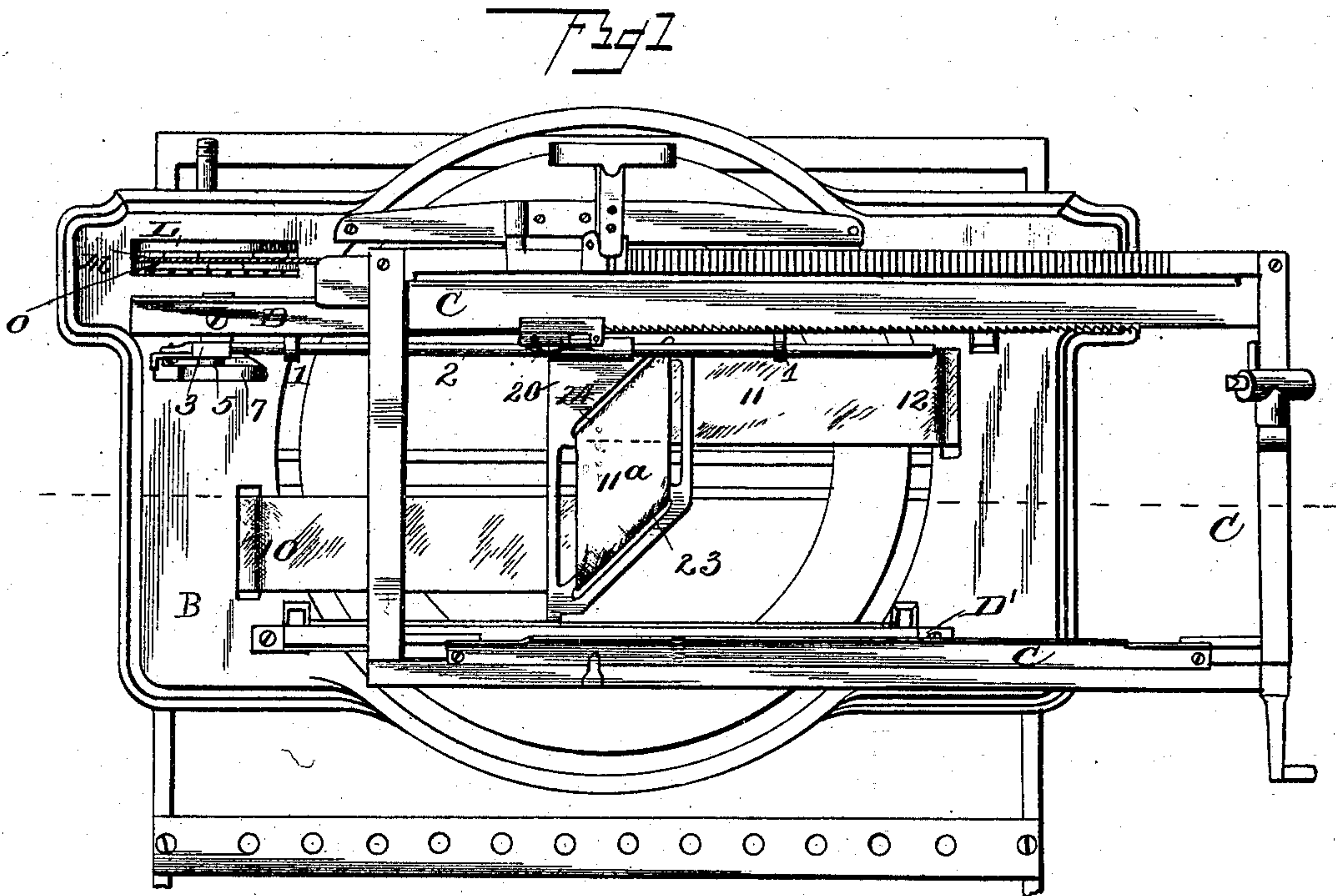
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A. T. BROWN.

RIBBON MECHANISM FOR TYPE WRITING MACHINES.

No. 503,736.

Patented Aug. 22, 1893.



Witnesses

John D. Davis
Edward C. Wells,

Inventor

Alex. T. Brown

By his Attorney

W. A. Bartlett

(No Model.)

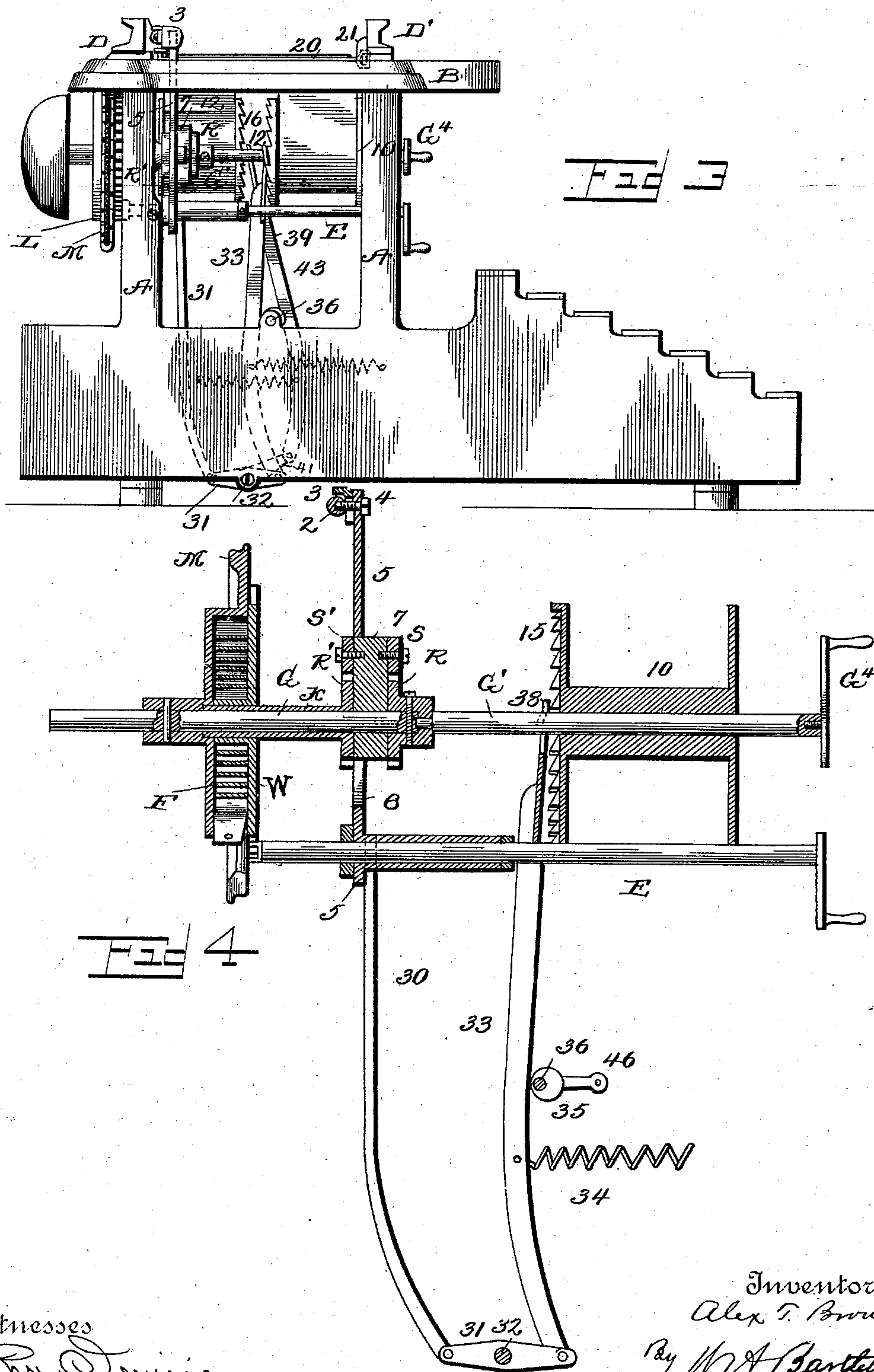
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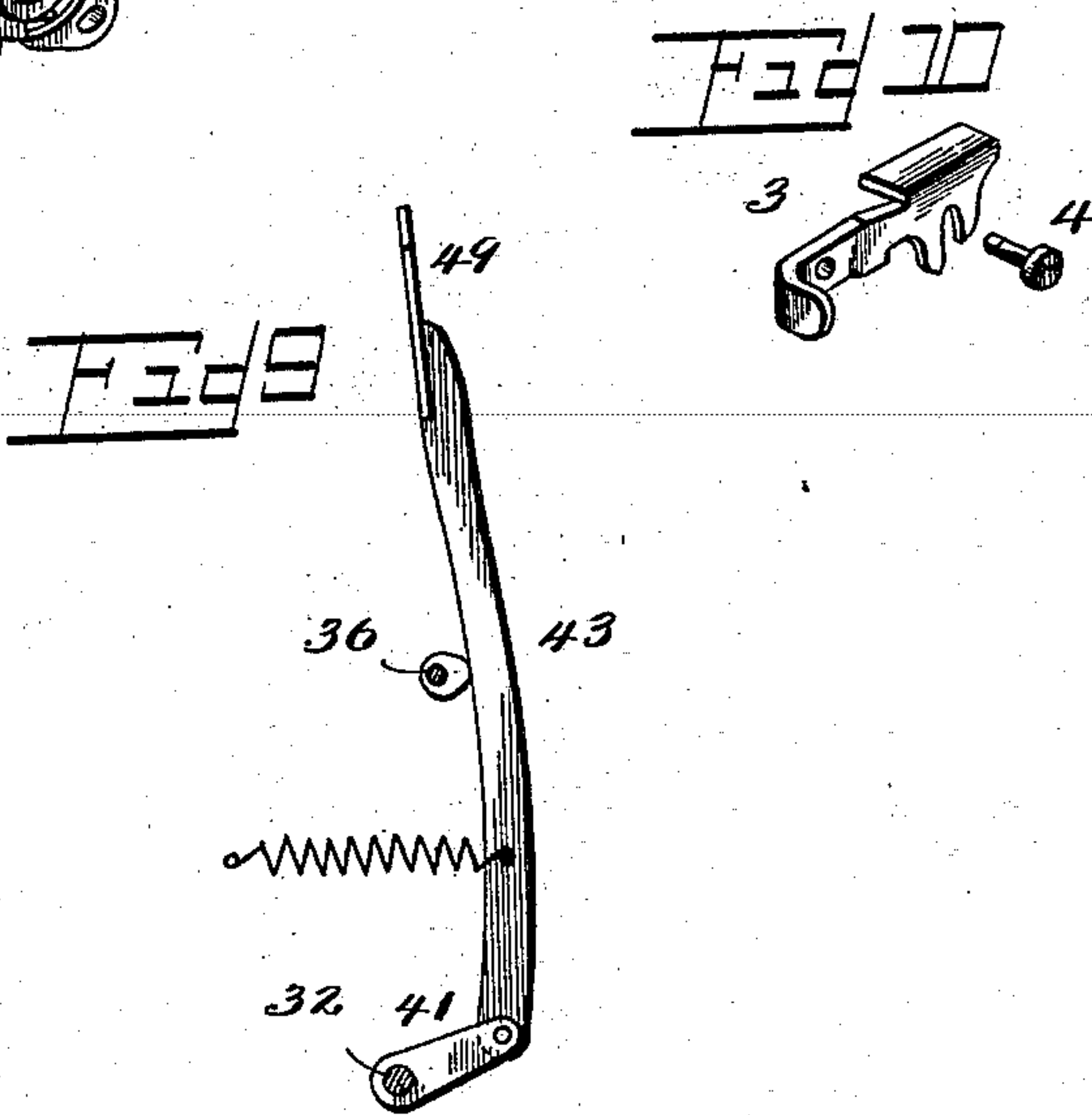
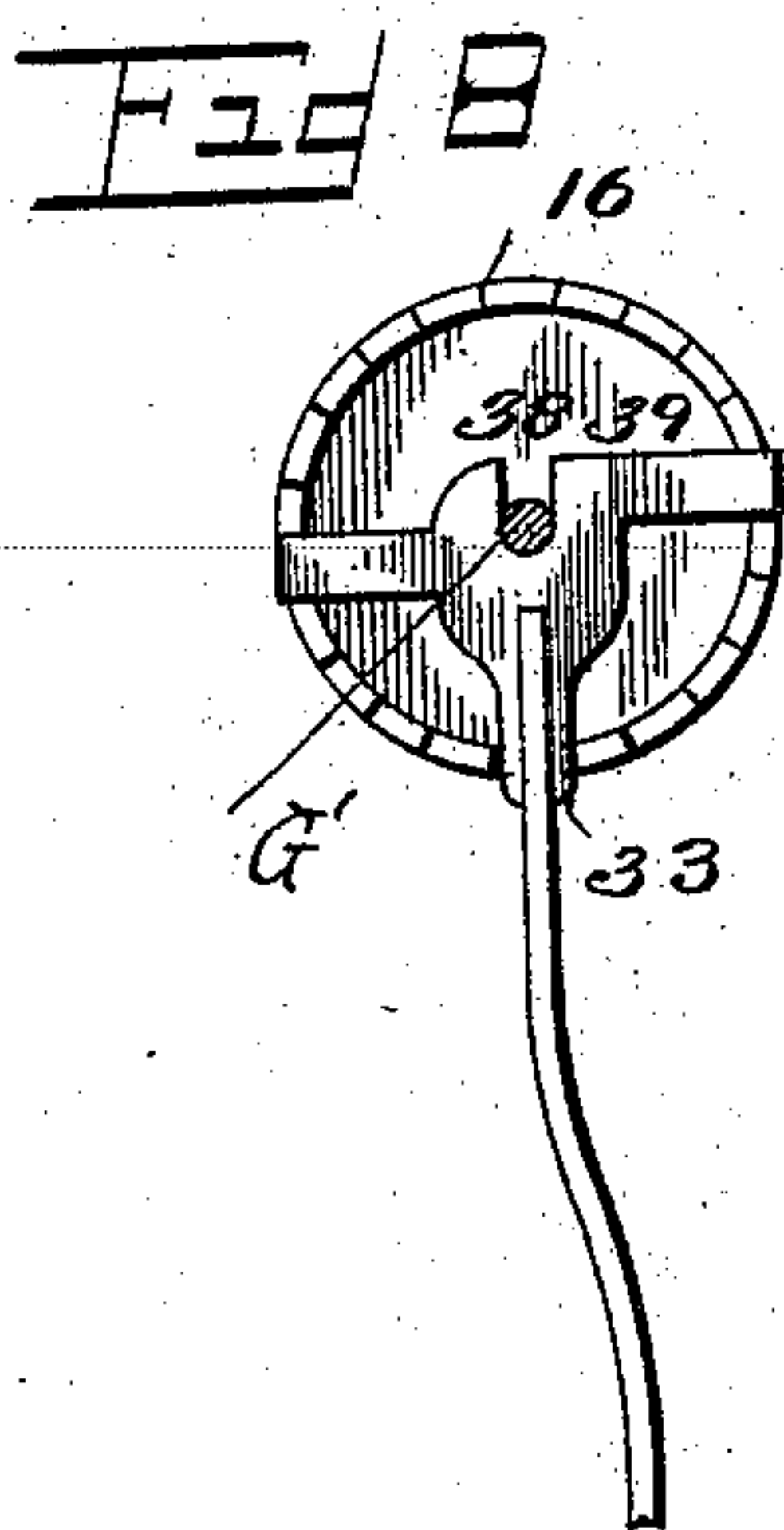
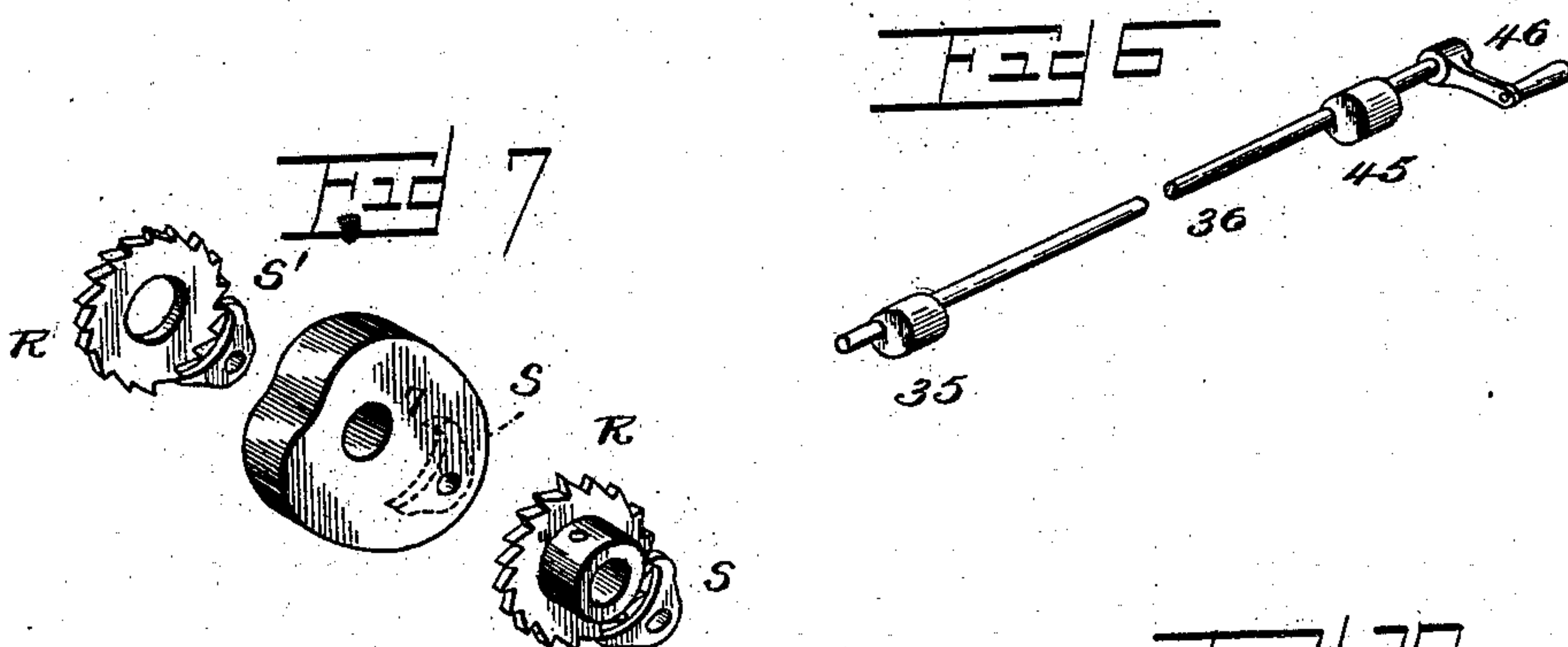
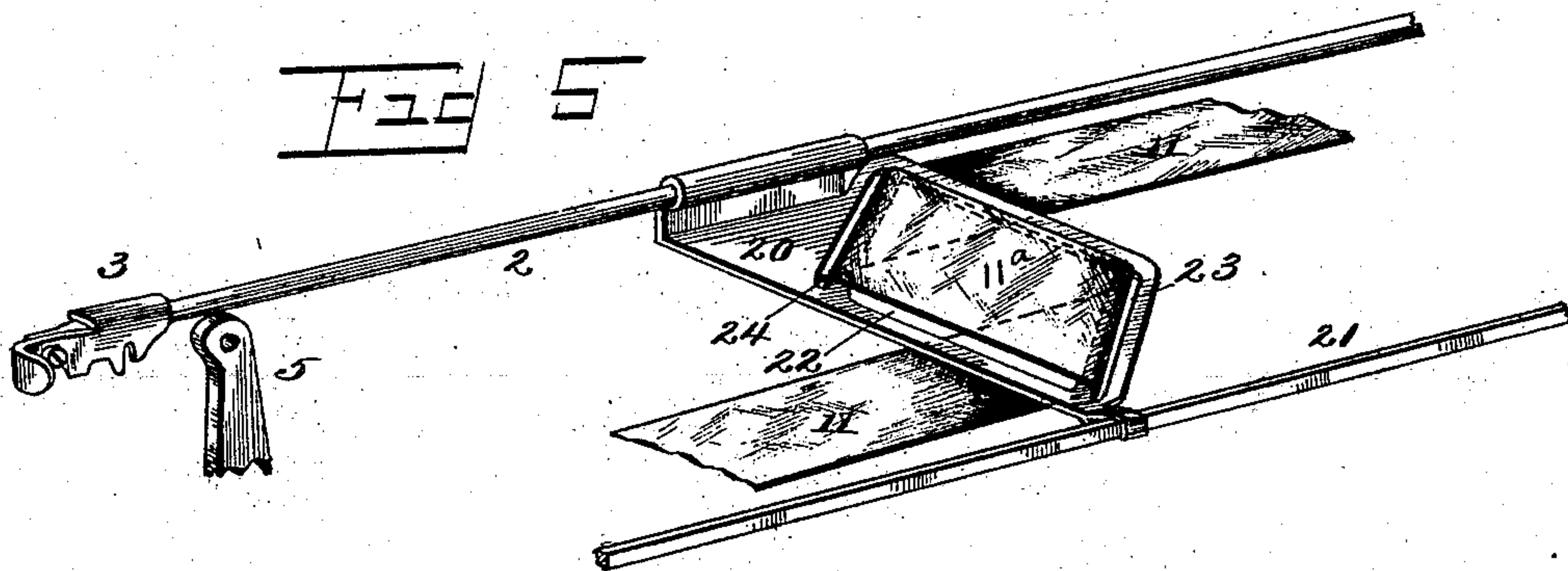
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Fig 11

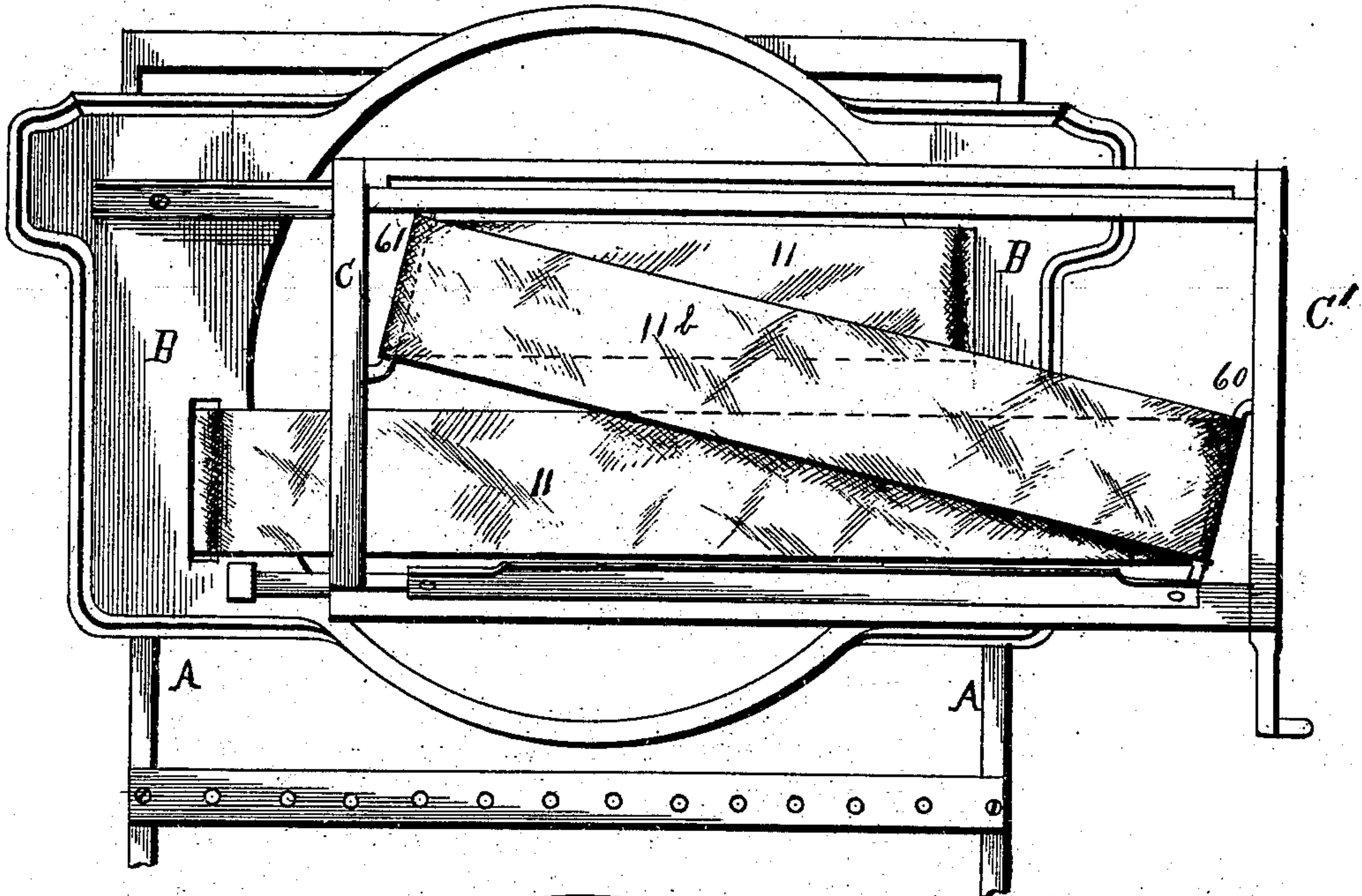
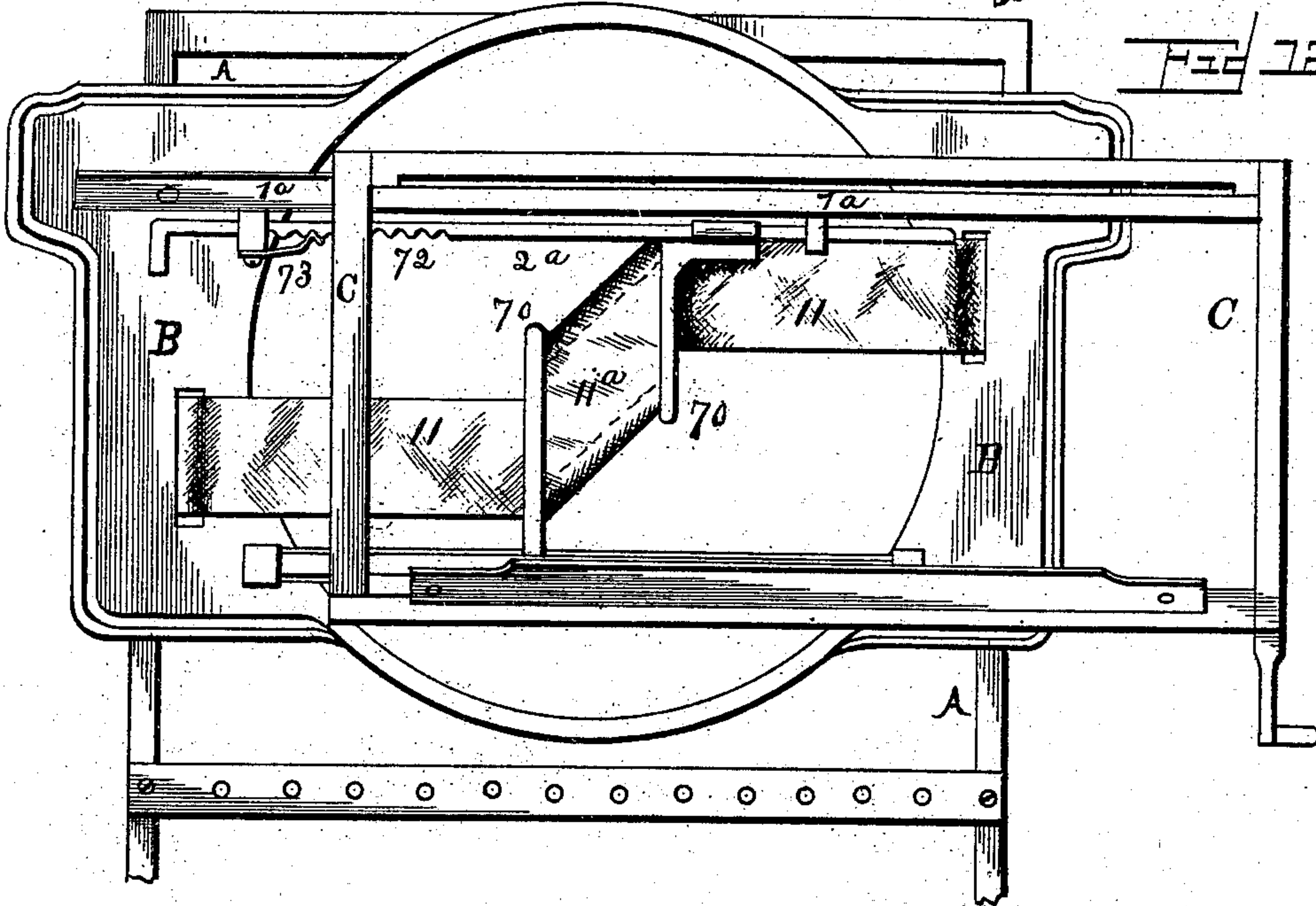


Fig 12



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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

RIBBON MECHANISM FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 503,736, dated August 22, 1893.

Application filed January 25, 1892. Serial No. 419,206. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Ribbon Mechanism for Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to the ribbon movement of a type-writing machine.

The object of the invention is to produce a machine in which the ribbon may travel in such directions as to present substantially its entire surface to the printing action; also to move the ribbon by connections from the carriage, so as to traverse the entire surface of the ribbon without regard to the length of movement of the carriage; also, to mount the ribbon in the machine that its direction of movement may be quickly changed; also, to move the operative ribbon surface slightly with each key or letter spacing movement of the machine; also, to enable the ribbon to be shifted quickly from the central part of the machine, to permit ready access to the type levers in cleaning; also, to improve details of the ribbon supporting and operating mechanism.

30 Figure 1, is a top plan view of so much of a type writing machine as is considered necessary to illustrate the invention, the roller platen being omitted, as well as other parts of the machine, and the improved ribbon mechanism applied. Fig. 2, is a longitudinal section showing parts of the machine and specially the ribbon supporting and operating mechanism, the roller being omitted. Fig. 3, is an end view of parts of the machine showing specially the ribbon apparatus. Fig. 4, is a section through the ribbon reel and supporting shaft at one end of the machine, showing parts for reversing the movement of ribbon in elevation. Fig. 5, is a perspective detail of the ribbon support above the top plate of the main frame, showing a part of the ribbon and broken parts of the actuating mechanism. Fig. 6, is a perspective detail of the cam shaft by which the ribbon pawls are controlled. Fig. 7, is a perspective detail of the cam and ratchets by which the ribbon moving lever is operated. Fig. 8, is a front ele-

vation of one of the ribbon spool ratchets and its engaging pawl. Fig. 9, is a side elevation and partial section of so much of the ribbon shifting device as is necessary to show the complement of the lever 33, Fig. 4. Fig. 10, is a perspective detail of the hook by which the swinging lever 5 is connected to the mechanism for moving plate 20. Fig. 11, is a plan of a modification. Fig. 12, is a plan of another modification.

I have shown the ribbon mechanism attached to a machine having a general resemblance to the machine patented to me December 22, 1891, No. 465,451, but as will appear, the ribbon mechanism may be attached to any one of several machines now on the market, with but slight change to the general structure of the machine, and I desire to claim the novel features of my present invention, wherever and however the same may be applied to type writing or analogous machines.

A indicates the frame of a type writing machine, and B the top plate thereof, on which or near which the type bars are supported, plate B having a central opening, in the center of which the type bars strike upward, as is common in the "Standard," "Caligraph," "Premier," and perhaps other machines. C denotes the carriage, and D D' the ways or tracks on which said carriage is guided in its endwise movement on the machine.

On the rear track D I form bearings 1, in which bearings a rod 2 may reciprocate longitudinally, the rod 2 thus moving parallel with said track D. Rod 2 has a hook 3 pivoted thereto, and this hook may engage a pin 4 at the top of lever 5, or may be detached from said pin and lever. The hook 3 serves as a handle, and, when not engaged with lever 5, the rod 2 may be slipped lengthwise by the hand of the operator, thus carrying plate 20, hereinafter referred to, away from the center of the machine. Lever 5 is pivoted at its lower end to any convenient support on the frame, in this case shown to be the shaft E, by which tension is regulated on the carriage moving spring F. But it is not essential that lever 5 shall be so mounted, as its pivot may be at any convenient point on the frame. The lever 5 has an opening or cam slot 6, in which a cam 7 has alternate engage-

ment at opposite sides. Cam 7 is carried by shaft G, and cam 7 may be connected to shaft G so as to rotate therewith, and thus swing the lever 5 alternately from one side to the other, rocking said lever on its pivot E. Shaft G is the axis of sleeve K, and sleeve K is the axis of wheel W, to the hub of which wheel the spring F is connected, said spring serving to actuate the pulley M, to which the carriage moving chain or cord O is attached. The shaft G is secured to the pulley M, so as to rotate therewith, and said shaft has ratchet wheel R secured thereto. Sleeve K has a fixed ratchet R'. Pawls SS', pivoted to cam 7, engage said ratchet wheels, and so cause the cam to rotate, as the shaft G rotates during the forward movement of the carriage; during the backward movement of the carriage the pawl S rides over the ratchet teeth R, and pawl S' holds against the ratchet R' so that cam 7 and lever 5 are not moved. Thus the lever 5 continues its movement to the extent of its stroke before it swings back on its pivot, whether the carriage moves a long or short distance. When the upper end of lever 5 swings back and forth, lengthwise of the machine, if said lever is connected by its hook 3 to the rod 2, said rod 2 will move lengthwise of the machine, in the bearings or slide ways 1.

A plate 20, which may be called the ribbon guide, has one end attached to rod 2, and the other end of said plate is guided by a guide bar 21 in a groove in the front way or track D', or in other suitable support below the position of the carriage, when applied to a machine in which the platen is above the printing point. The plate 20 has an opening 22 near its central portion, to permit the printing characters to strike upward through said opening toward the paper supported above the same. In front and in rear of this opening there are oblique slots or bearing surfaces 23 and 24, each extending preferably at an angle of forty-five degrees to the rod 2. Bars or spindles may be used instead of a slotted plate.

The ribbon 11 is wound on spools 10 and 12, one near the front and the other near the rear corner, at opposite ends of the machine. The central portion of the ribbon, after leaving spool 10, passes along parallel with the track D' until it reaches plate 20, then extends through slot 23, turns toward the rear, forming a diagonal or bias fold, and then by a second similar turn or fold, passes through slot 24, and thence leads near track or way D toward the spool 12. The section 11^a of the ribbon, between slots 23 and 24, will be a loop or tuck in form of a rhomboid, and the side presented uppermost will be the reverse of that between said slots and the end of the machine. Now, if the spools or reels 10 and 12 be held from rotation, it is apparent that the ribbon 11 will have no longitudinal movement; but as plate 20 reciprocates lengthwise of the machine, the ribbon will slip through the slots

23 and 24, and the rhomboidal section 11^a of the loop or tuck in the ribbon, between said slots, will constantly change. The guide 20, as it shifts, moves the rhomboidal section 11^a of the ribbon lengthwise of the machine, but the part of the ribbon which forms this rhomboidal surface is constantly changing, and moving from the front toward the rear of the machine, or vice versa, so that each letter as it strikes upward will strike a new point on the ribbon. Thus the longitudinal movement of guide 20, causes a transverse and a longitudinal movement of each part of the ribbon surface embraced in the rhomboid, 11^a.

As in my Patent No. 465,451, the escapement, actuated by the movement of a key, permits the lengthwise movement of the carriage to space between letters, and through the train of mechanism hereinbefore described, causes a slight shift of the ribbon, corresponding to said space. But if there were no arrangement for shifting the ribbon endwise, the part of the ribbon embraced in the rhomboid 11^a would soon be worn out, or at least exhausted of ink.

To secure a step by step longitudinal movement of the ribbon, one or the other of the spools 10, 12 is caused to rotate a short distance with each shift of the guide 20. In the machine illustrated this movement is caused by the train of mechanism now about to be described. The ribbon spool 10 is attached to a short shaft G', which for convenience has a bearing in the hub or ratchet R, or in the end of shaft G, but shaft G' is free to rotate quite independently of shaft G, and a crank G⁴ attached to said shaft serves to wind the ribbon on the spool 10. Spool 10 has a crown ratchet wheel 15 firmly connected thereto. A link 30 connects an arm of lever 5 to a two-armed lever 31, which lever 31 is rigidly connected to a rock shaft 32. Shaft 32 has bearings in the frame, at each end of the machine, and said shaft rocks when lever 31 is moved by link 30. A pawl 33 is connected to the end of lever 31 opposite to link 30, and extends upward into position to engage the ratchet 15 on spool 10, being drawn toward said ratchet by spring 34, which is connected to the pawl and any convenient part of the frame. A rock shaft 36 extends from end to end of the frame, and bears a cam 35, and a shaft 36 may be turned to throw the pawl 33 out of engagement with the ratchet wheel 15. The upper end of pawl 33 has a cross bar 39, with a notch 38 therein, which notch straddles the shaft G', and serves as a guide to the pawl in its vertical movement. The opposite ends of cross bar 39 engage the teeth of crown ratchet 15, one of said ends engaging a tooth on the upstroke of the pawl, and riding over the tooth on the down-stroke, and the other end engaging on the down-stroke and riding over the teeth on the upstroke. The edges of cross-bar 39 are bent inward to conform to the teeth. The pivotal connection of pawl 33 with lever 31, or the elasticity of the bar, per-

mit the very slight rocking necessary to bring the opposite ends of bar 39 into operative engagement with the crown ratchet teeth. At the other end of shaft 32 an arm 41 rigid with said shaft, carries a pawl 43, which has a cross bar 49, and pawl 43 operates on crown ratchet 16 of ribbon spool 12, precisely as has been described as the operation of pawl 33 on ratchet 15. Preferably the ratchets 15 and 16 face one toward the front and the other toward the rear of the machine. The cams or eccentrics 35 and 45 on rock shaft 36 are in position to throw one pawl, as 33, out of engagement with its ratchet, while the other, as 43, is in engagement with its ratchet. Thus the rock shaft 32 will cause a step by step feed of the ribbon in one direction or the other, and the direction can be at any time changed by rocking shaft 36 by means of crank 46. Rock shaft 36 will be supported in suitable bearings on the frame, preferably above the key shafts or levers. The spool 12 is supported on a shaft G^3 , and the ribbon spools may be turned by hand, (in the direction permitted by the engagement of the pawls with their respective ratchets) by means of small cranks G^4 at the ends of the spool shafts. Of course it is not essential to the operation of the ribbon that the step by step movement be produced by the particular ratchet mechanism I have described, as many other well known mechanisms will produce a similar movement. I consider this particular mechanism well adapted for use with the machine I have heretofore patented, as stated. The hook 3 may quickly be detached from the lever 5, and the bar 2 can then be drawn lengthwise, moving the plate 20 with it. This removes the ribbon from the central part of the machine, so that ready access may be had to the type at the center of the type basket for cleaning the same, or for the application of a wrench or key for rotating a brush, as in the "Premier" machine.

In the modification shown in Fig. 11, the carriage C' runs on ways on the top plate B of the machine as usual. Near one front and one rear corner of the inside of the carriage frame there are oblique bars 60, 61, and these oblique bars serve as ribbon guides. The ribbon 11 is carried on suitable reels or supports, which may be such as have been described, or other usual or equivalent construction. The ribbon extends from one of these reels, nearly parallel with the frame of the carriage, passes over the bar 60, thence by an oblique turn to the bar or guide 61, and then by a return bend to the second reel or support, the rhomboidal part of the ribbon, 11^b , between the guides, being that portion which the type will strike in striking upward toward the paper. It will be understood that the longitudinal reciprocation of the carriage draws the ribbon across the guides 60 and 61, so that the rhomboidal section 11^b is constantly changing. In this modification said rhomboidal section necessarily changes with

each reciprocation of the carriage. The medial line of said section parallel with the sides of the carriage must be as long as the longest line to be printed.

In Fig. 12 the ribbon guide 70 is shown as connected to the bar 2^a , which is supported in bearings 1^a , as has been described of the device shown in Fig. 1. The bar 2^a has notches 72, in one face, and a spring 73 attached to one of the bearings 1^a enters one of these notches, and holds the bar 2^a in any position to which it may be adjusted, lengthwise of the machine. In this modification the bar 2^a is supposed to be detached from the lever 5, (Fig. 1.) Now if the ribbon be given a longitudinal movement, a certain portion of the ribbon, which will be in a line parallel with the edges of the ribbon, will be struck by the printing characters. But by moving the guide 70 lengthwise on the machine, as by drawing bar 2^a so that the spring engages another notch 72, the position of the rhomboidal section 11^a will be slightly changed, and another longitudinal line of the ribbon will be used.

Of course many other constructions might be adopted to produce similar results. I have illustrated and described devices known to me, as being the best with which I am at present acquainted, but I do not confine myself generally in my claims to precise constructions, as I have made many other modifications, all within the scope of my invention.

What I claim is—

1. In a type writing machine, a ribbon guide under the carriage having oblique ribbon supporting surfaces, around which the ribbon passes, and means connected to the carriage moving apparatus for reciprocating said guide longitudinally and automatically during the longitudinal movement of the carriage, all combined substantially as described.

2. In a type writing machine, a ribbon guide over which the ribbon passes, automatic mechanism connected to the carriage moving devices and for shifting said guide lengthwise of the machine, and means for moving the ribbon lengthwise independently of the ribbon guide, in combination substantially as described.

3. In a type writing machine, a ribbon guide having an open center and oblique ribbon bearing surfaces, means for shifting said guide lengthwise of the machine, and a catch by which the guide may be connected to or disconnected from the shifting mechanism, all combined substantially as described.

4. In a type writing machine, a ribbon guide, a longitudinally movable bar to which said guide is connected, and a lever pivotally connected to the frame, and having detachable engagement with said bar, with means for rocking said lever on its pivot, all combined substantially as described.

5. In a type writing machine, the ribbon supporting guide, a lever hung in the frame and connected to said guide to shift the same longitudinally, and a cam connected to the

carriage-moving mechanism and bearing on said lever, the parts in combination substantially as described.

6. In a type writing machine, the carriage moving pulley and its shaft, a lever having an arm at each side of the shaft, a cam supported on the shaft and engaging said lever, a ratchet wheel connected to the shaft and having pawl engagement with the cam to turn the same in one direction and thus swing the lever, and a ribbon guide connected to said lever and moved thereby, all combined substantially as described.

7. In a typewriting machine, the ribbon supports at opposite ends of the machine, and the ribbon guide between said supports having a plurality of oblique surfaces round which the ribbon is looped, whereby a movement of the guide in the direction of the length of the ribbon moves the loop without slacking or moving the main part of the ribbon.

8. The combination with the supporting frame, of two ribbon reels at opposite ends of the frame, one of said reels being near the front and the other near the rear of the frame, and a ribbon guide over which said ribbon passes, the guide having inclined surfaces about which the ribbon turns obliquely, substantially as described.

9. In a typewriting machine, the ribbon reels supported on relatively stationary bearings near the front and rear of the carriage, the ribbon guide having oblique bearing surfaces respectively near the front and rear of the carriage across which surfaces the ribbon passes, and means for shifting said guide simultaneously with the carriage movement, all combined substantially as described.

10. The combination of the rock shaft having an arm at each end, a pawl pivoted to said arm, the ribbon reels having ratchets with which said pawls engage, and a rock shaft 36 having cams opposite said pawls, serving to engage one pawl and disengage the other with a single movement of the shaft 36, substantially as described.

11. The combination of the ribbon reel having a crown ratchet as described, a pawl having a cross-bar extending across the face of said crown ratchet, and means for actuating said pawl to turn the ribbon reel both with the advance and the retreat of said pawl during the carriage movement, substantially as described.

12. The combination of the reel shaft, the ribbon reel thereon having a crown ratchet

at one end, the pawl having a notched cross-bar straddling the spool shaft and the ends of the bar engaging the ratchet teeth at opposite sides and in opposite directions, and means for reciprocating said pawl as the carriage moves, all substantially as described.

13. In a type writing machine, a ribbon guide having bearing surfaces extending obliquely with reference to the sides of the machine and means for transversing said ribbon guide automatically lengthwise of the ribbon, substantially as described.

14. In a type writing machine, the ribbon reels at the ends of the machine having their axes practically parallel, the oblique ribbon guide around which the ribbon passes, and means for adjusting said guide with reference to the ribbon reels, and means for automatically shifting said guide, connected to the guide and carriage shifting mechanism in combination substantially as described.

15. In a typewriting machine, the ribbon supports at opposite ends of the machine, an adjustable ribbon guide between said supports round which the ribbon passes with oblique turns, whereby said guide may be moved lengthwise of the ribbon without slacking the tension thereof, and means for holding said guide in its relation to the working parts, and for shifting it by hand in the direction of the length of the ribbon, all combined substantially as described.

16. In a type writing machine, the ribbon reels, a ribbon guide having oblique surfaces over which the ribbon passes, and a train of driving mechanism connected to said guide and actuated by the carriage movement in one direction only substantially as described so that the ribbon guide completes its movement no matter from what point the carriage may be retracted, substantially as described.

17. In a type writing machine, the ribbon reels, the ribbon guide having oblique bearing surfaces, a bar connected to said guide, and a ratchet and pawl mechanism operating on said bar through suitable intermediates, to shift the ribbon guide as the carriage moves in one direction, but to permit a lost motion as the carriage moves in the other direction, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER T. BROWN.

Witnesses:

PHILIP F. LARNER,
W. A. BARTLETT.