

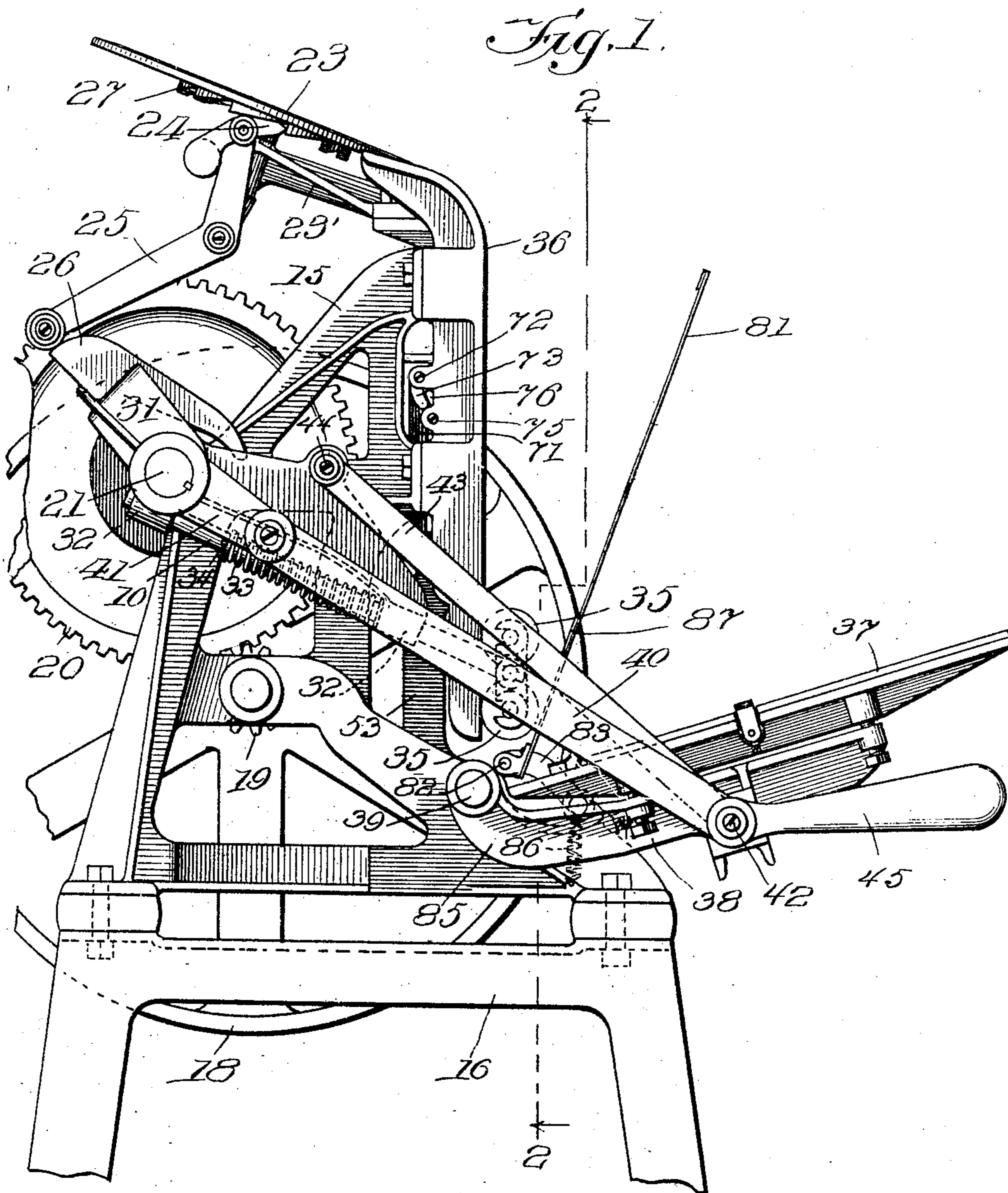
No. 774,912.

PATENTED NOV. 15, 1904.

J. S. DUNCAN.
PRINTING MACHINE.
APPLICATION FILED MAR. 28, 1904.

NO MODEL.

7 SHEETS—SHEET 1.



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F. B. Allen

Inventor:
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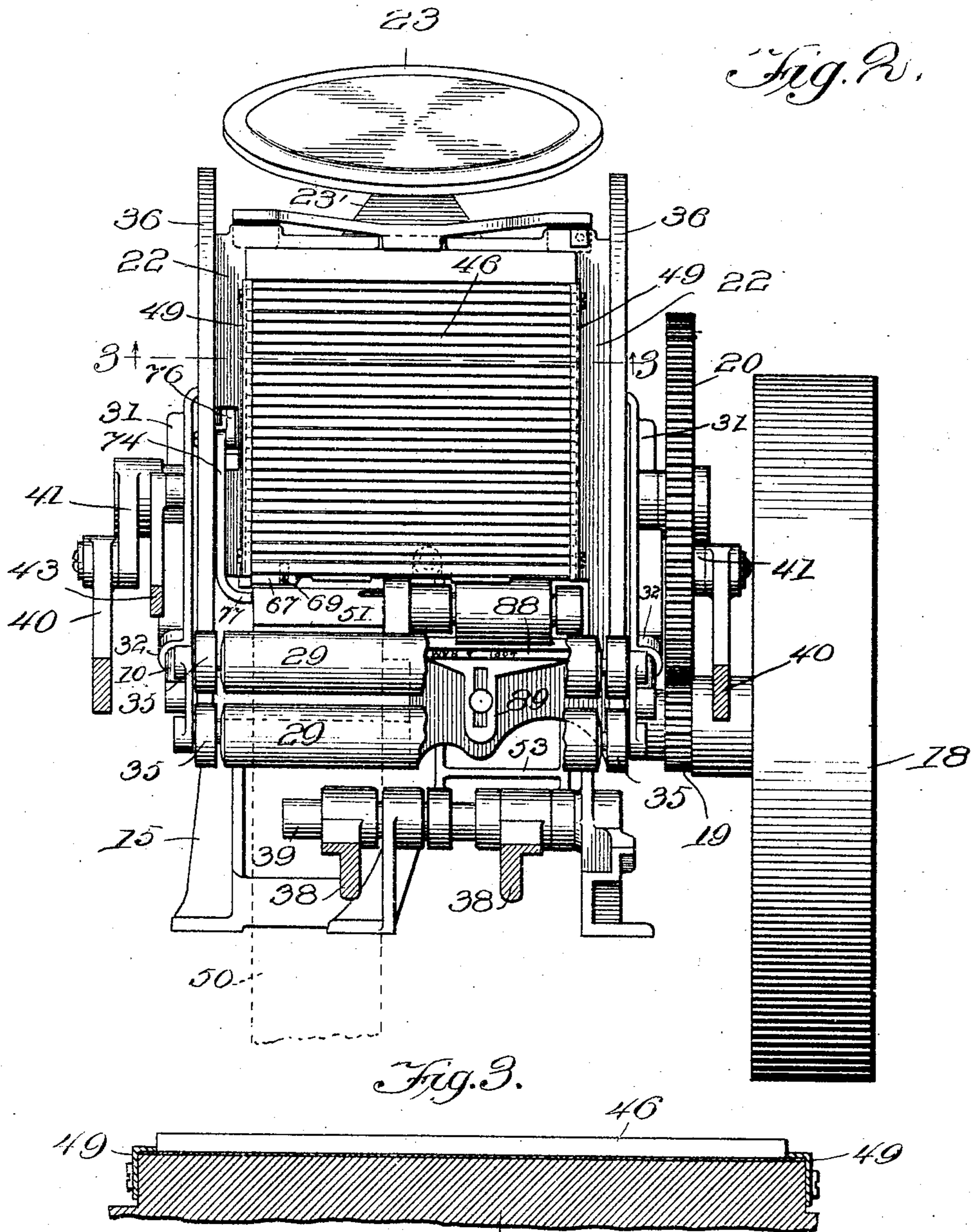
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7 SHEETS—SHEET 2.



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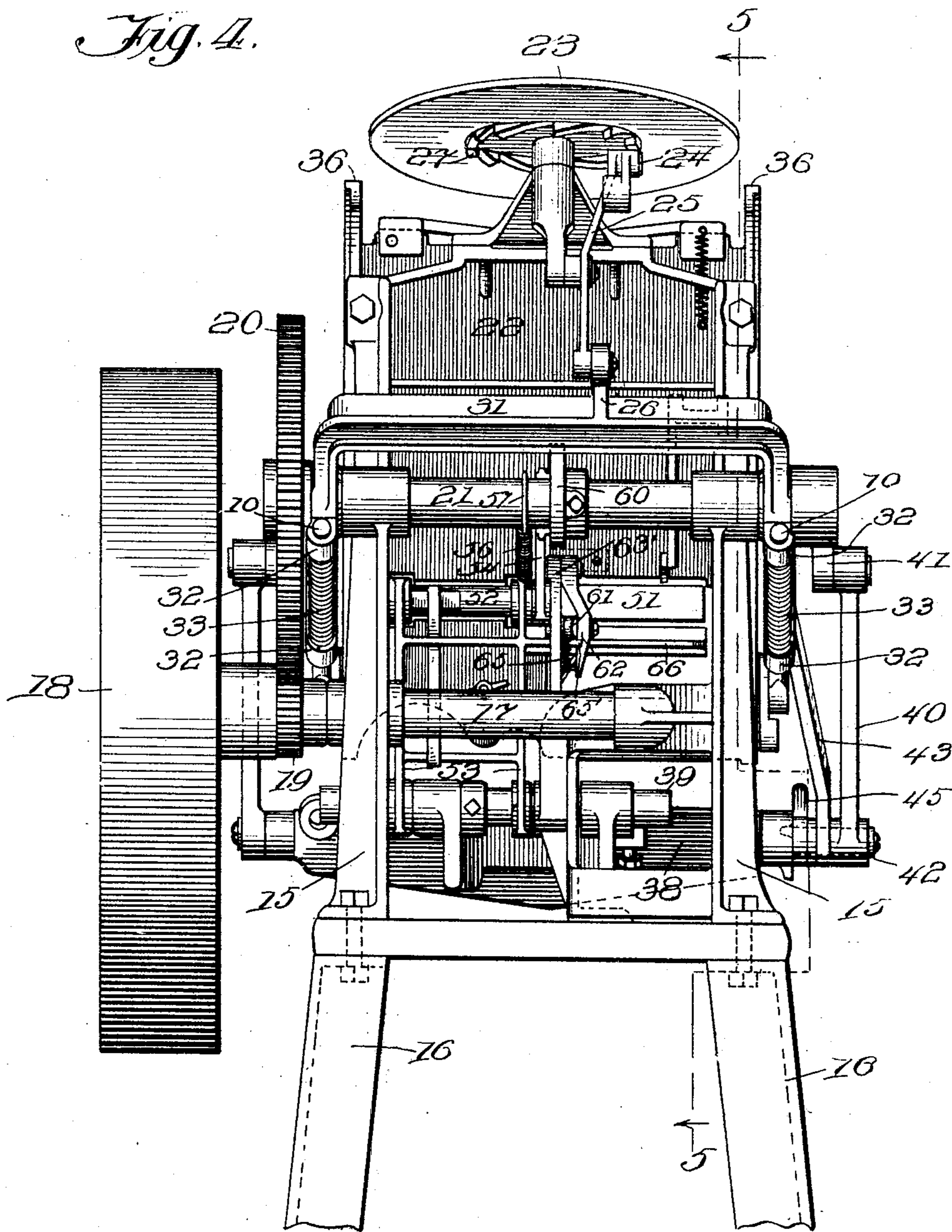
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7 SHEETS—SHEET 3.



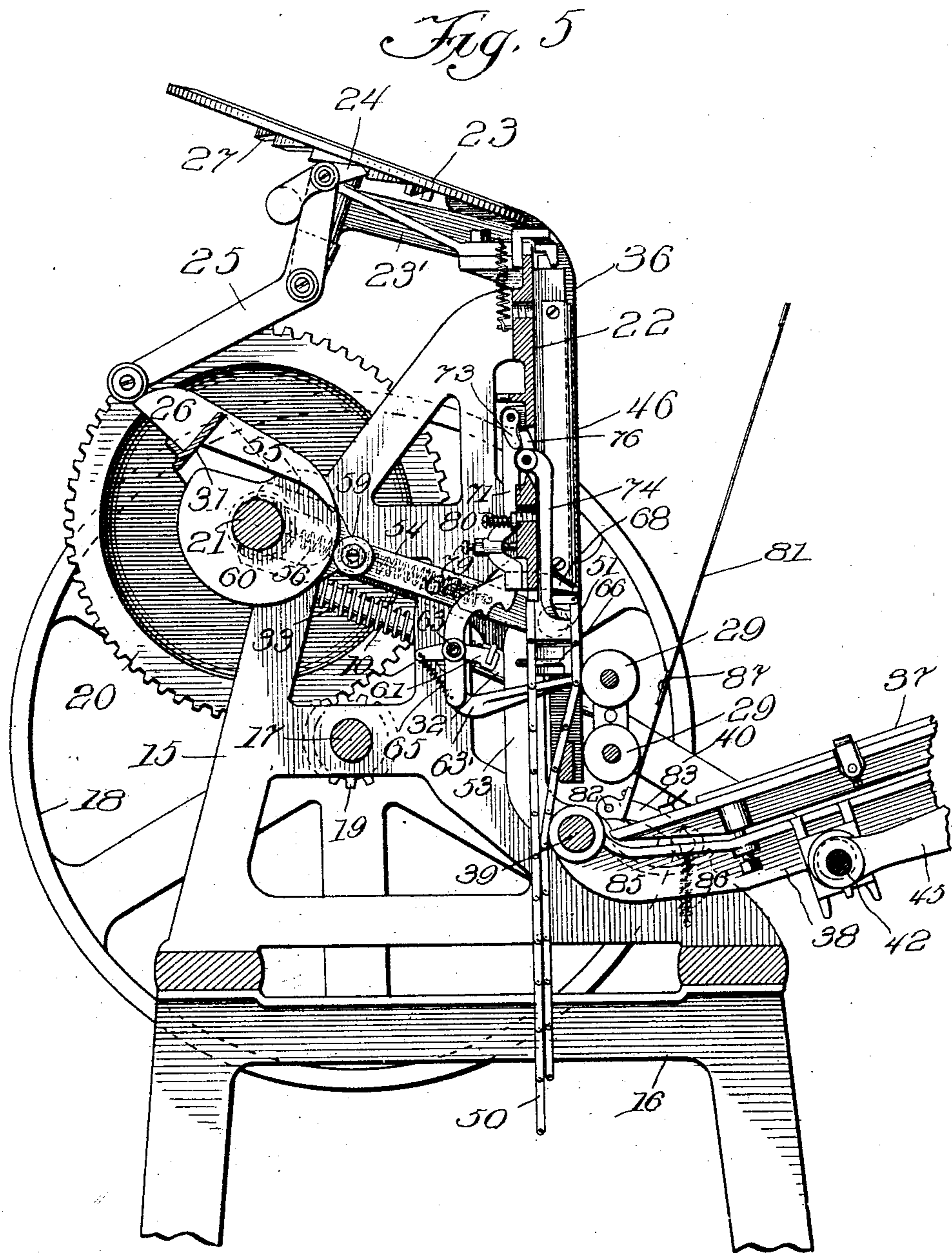
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7 SHEETS—SHEET 4.



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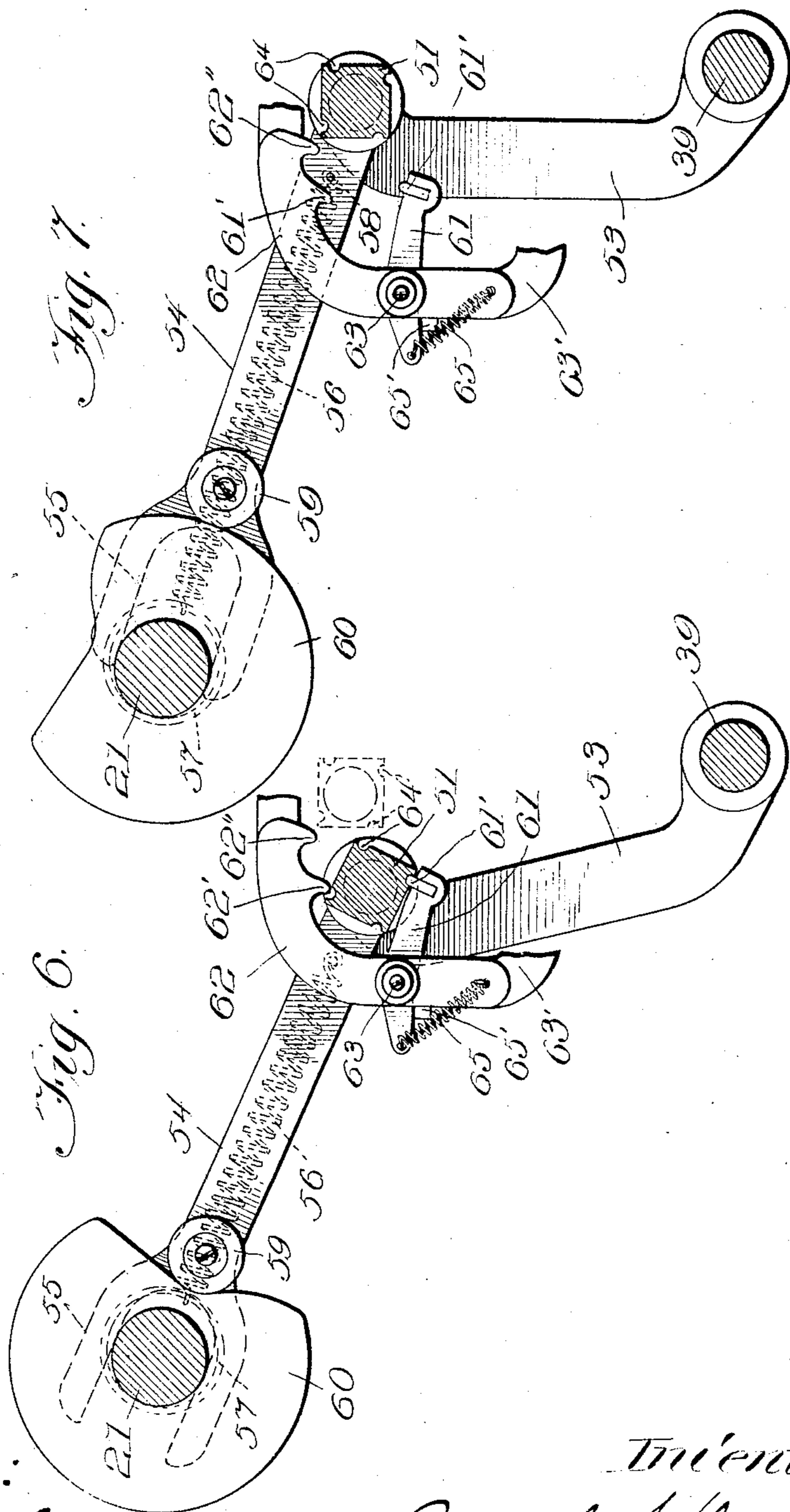
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7 SHEETS—SHEET 5.



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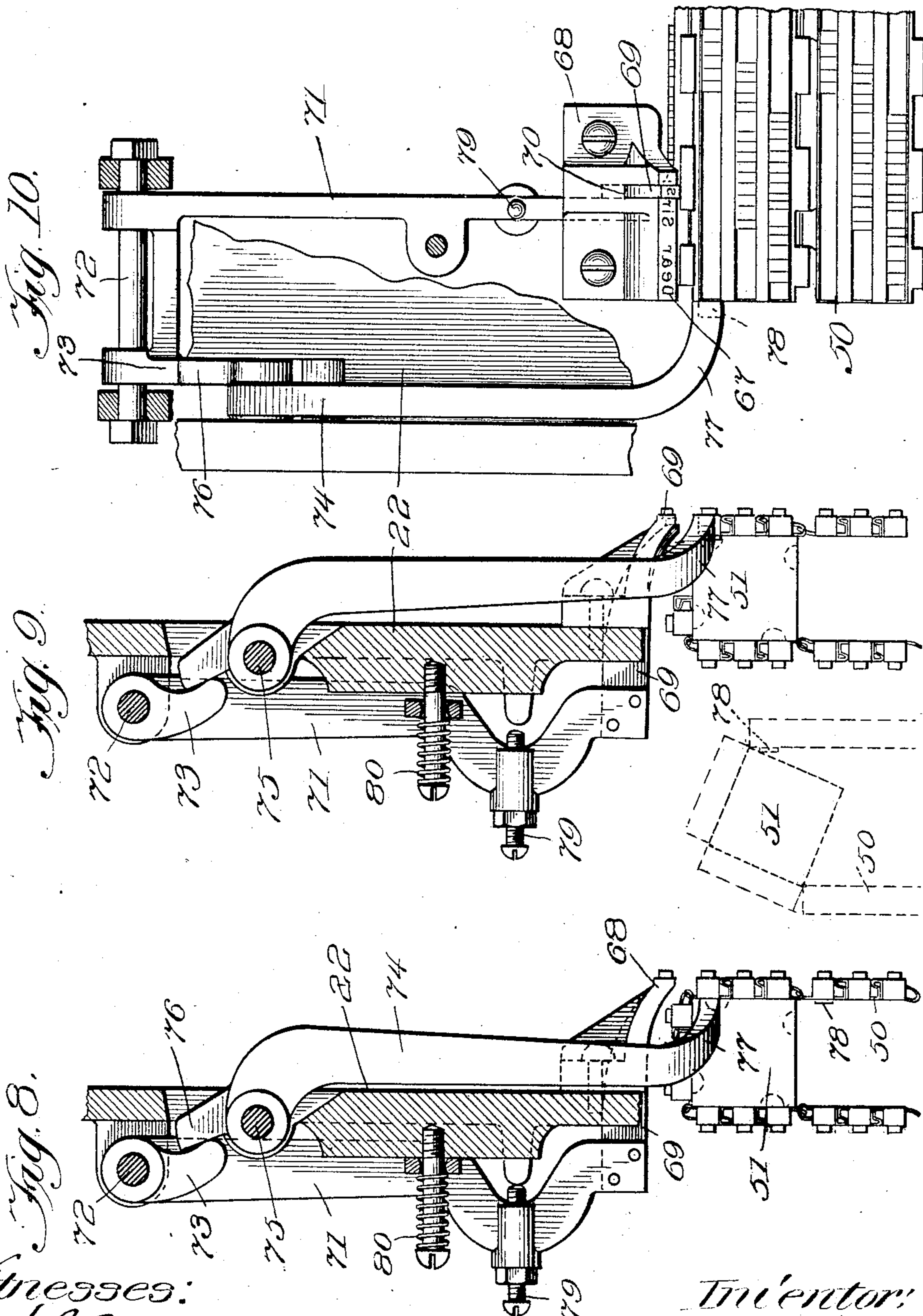
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7 SHEETS—SHEET 6.



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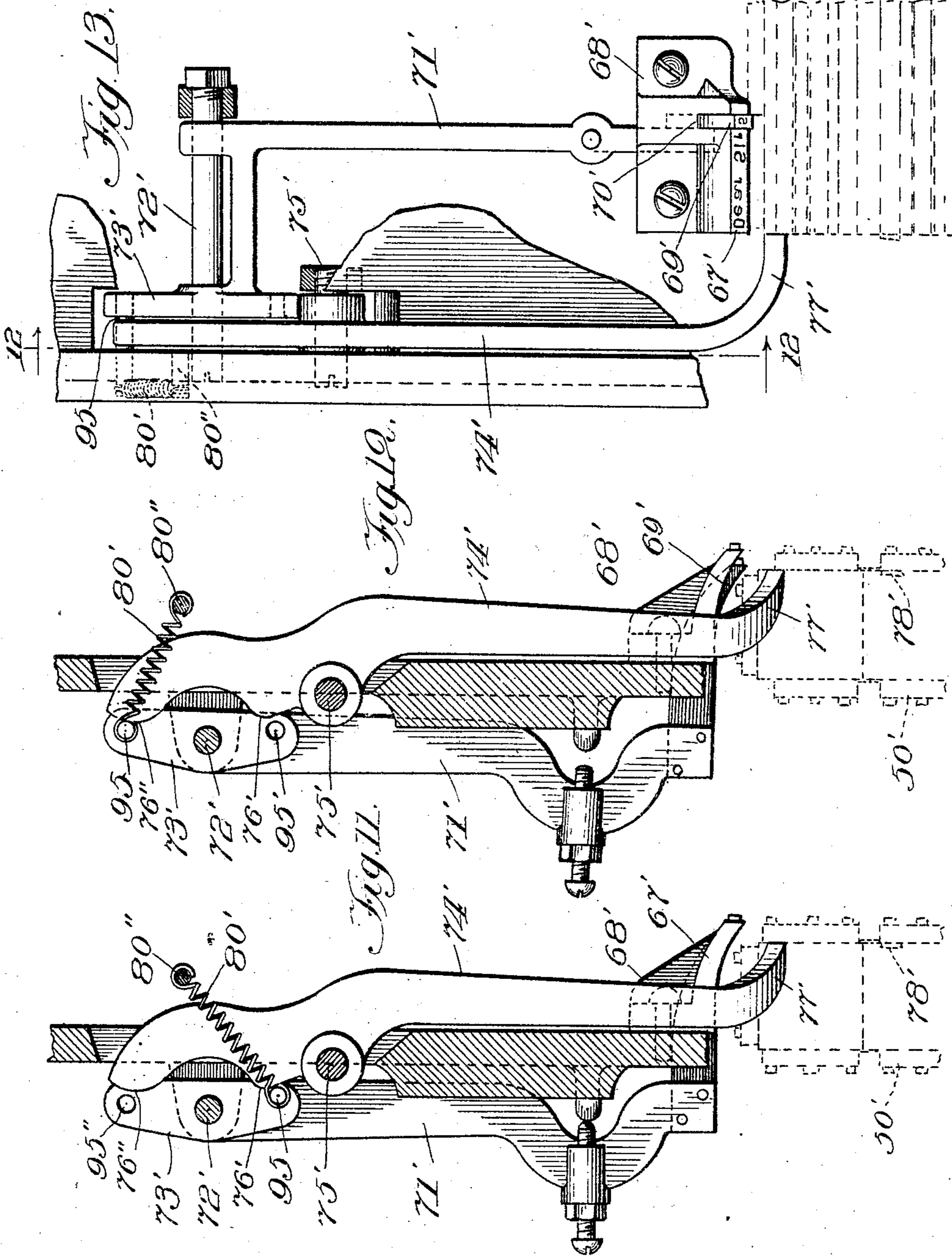
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APPLICATION FILED MAR. 28, 1904.

NO MODEL.

7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

JOSEPH S. DUNCAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO ADDRESSOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 774,912, dated November 15, 1904.

Application filed March 28, 1904. Serial No. 200,391. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

The primary object of this invention is to print circular letters and an individual address on each letter in one printing operation in the same machine.

Another object of the invention is to print in the one operation the salutation "Dear Sir:" or "Dear Sirs:", as each address may require.

The invention also has for its object to provide a machine of simple construction for printing and addressing circular letters, which can be easily operated and which works to all intents and purposes like an ordinary job-printing press; and it has other objects in view, which will be fully pointed out hereinafter in the detail description of the machine, which is illustrated in the accompanying drawings as showing one embodiment of the invention.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a sectional view on the line 2 2 of Fig. 1 without the base. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 2. Fig. 4 is a rear elevation of the machine. Fig. 5 is a vertical sectional view on the line 5 5 of Fig. 4. Figs. 6 and 7 are detail views showing the operating devices for the drum which carries the chain of address-forms. Figs. 8, 9, and 10 are sectional views showing in detail the devices for printing the salutation. Figs. 11, 12, and 13 are similar views showing another construction of the device for printing the salutation.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

Referring to the drawings, 15 is a main frame mounted upon a base 16 and carrying the operative parts of the machine. A power-shaft 17 is journaled in bearings in the frame and carries a belt-pulley 18 and a pinion 19, the latter meshing with a gear 20 on the counter-

shaft 21. The frame is provided with a bed 22 and an ink-plate 23, the latter being mounted on a bracket 23' on the main frame. A weighted pawl 24 is carried by a crank-lever 25, which is operated by a cam 26 to cause the pawl to engage ratchet-teeth 27 on the under side of the ink-plate to revolve the ink-plate in a well-known manner.

The ink-rollers 29 are carried by rods 30 in a rocking frame 31, mounted on the counter-shaft 21 and carrying the cam 26. These rods work in bearings 32 in said rocking frame, and a spring 33 is fastened at one end 34, Fig. 1, on each rod between the bearings to cause the rollers to properly engage the type-form. The usual trucks 35 are provided at each end of the ink-rollers to travel on the tracks 36 at each side of the bed, Fig. 2.

The platen 37 is adjustably mounted on a platen-frame 38, which oscillates on a shaft 39, and its oscillation is effected through the medium of links 40 on the sides of the machine, which are pivotally connected to cranks 41 on the counter-shaft and to the concentrically-turned ends of an eccentric shaft 42 on the platen-frame. A link 43 is pivotally connected at one end to the main frame at 44 and at its other end to the concentric portion of the shaft 42, and a throw-off handle 45 is also fastened to said shaft to adjust the same and prevent the platen from moving into printing-contact with the form.

I do not confine myself to the use of a form of any particular character or to any especial means for mounting the form on the bed; but for illustrative purposes I have shown a form 46 made up, preferably, of rubber type arranged in trays 47, Fig. 3, which are secured on a holder or chase 48 by adjustable side strips 49. This holder is fastened to the bed by any suitable means.

I may employ address-forms made up of rubber or other type or printing-plates or other equivalent devices adapted to be connected into a chain or belt to travel over a drum or similar device to bring the addresses successively into printing position adjacent to the main frame, and in the drawings

I have shown a chain 50 made up of address-forms linked together in any suitable manner and arranged to travel on a rectangular drum 51, provided on each side with a recess 64 and mounted or formed on the end of a drum-shaft 52, which is carried by an oscillating drum-frame 53, mounted on the shaft 39. A rod 54 is connected at one end to the drum-shaft, and its other end is provided with a fork 55 to receive the counter-shaft. A spring 56 is fastened at one end to a collar 57 on the counter-shaft and at its other end to the rod 54 at 58, the purpose of this spring being to hold the antifriction-roller 59, mounted on the rod, against the operating-cam 60 on the counter-shaft and to pull the drum back from printing position after the printing operation has been completed. In the swinging movement of the drum caused by this spring and cam the drum is revolved a one-quarter turn to bring a new address into printing position, and this feeding movement of the drum is accomplished by two arms in the nature of pawls 61 and 62, pivoted at 63 on a bracket 63' on the main frame. On the rearward movement of the drum from the position shown in broken lines to the position shown in full lines in Fig. 6 a projection 61' of suitable character on the pawl 61 engages the recess 64 on that side of the drum which has been the back during the preceding printing operation, and on the continued rearward movement of the drum against the fixed pawl the drum is revolved a portion of a quarter-turn. Thereafter on the forward movement of the drum a projection 62' on the pawl 62 engages the recess 64 on the uppermost side of the drum, and on the continued forward movement of the drum this pawl causes the drum to complete its quarter-turn, as shown in Fig. 7. Instead of the recesses 64 the drum may be provided with some equivalent device with which the pawls can engage to revolve the drum, as heretofore described. The rear ends of the pawls behind the pivot 63 are connected by a spring 65 to hold the pawls in proper position for their work, and a lug 65' on one pawl projects across the other to prevent the spring from pulling them out of operative position. I prefer also to provide a safety projection 62'' on the pawl 62 to engage the drum in event the projection 62' fails to do so, and thus insure the completion of the quarter-turn of the drum.

The frame 53 is provided with an arm 66, which projects beneath the drum to form a back for the address-form immediately below the one which is backed by the drum in position to print, and this arm is arranged to hold the address-form in position to be engaged and inked by the inking-rollers, and thus each of the address-forms will be inked twice, once while in front of the arm and once while in printing position on the drum.

Referring to Figs. 9, 10, and 11, the salu-

tation-form 67 is carried by a plate 68, which is adjustably mounted on the bed to bring said form in proper position between the address and body forms. For printing the singular salutation "Dear Sir:" or the plural salutation "Dear Sirs:", as each address requires, I have provided a movable letter "s," which is automatically moved in and out of printing position. As the plural salutation is employed more frequently than the singular, I preferably construct the machine with the final letter "s" always in printing position and provide for moving it out of printing position when the singular salutation is required. This final letter "s" is carried on an arm 69, which projects through a slot 70 in the plate 68 to bring said letter into proper alinement and position. The arm is carried by a lever 71, which is fastened to a shaft 72, journaled in bearings on the back of the bed and carrying a short arm 73. A crank-lever 74 is pivoted at 75 to the bed and has a short arm 76 arranged to engage the arm 73 and its long arm 77 bent in position to be engaged by a projection 78 on each address-form which requires a singular salutation. On the forward movement of the drum, carrying into printing position an address-form requiring a singular salutation, the projection 78 on each address-form will engage and move the crank-lever 74, which acts as a trigger and operates lever 71 and causes the arm 69, carrying the final letter "s," to be sufficiently retracted to prevent said letter from printing. The forward movement of the arm 69 can be regulated by a screw 79 to properly adjust the letter "s," and a spring 80 presses the arm forward, with the letter "s," carried thereby, held normally in printing position.

In Figs. 11 to 13 I have shown a construction which permits the movable letter "s" to be held normally in or out of operative position. In this construction the letter "s" is carried by an arm 69', which projects through a slot 70' in the plate 68', which carries the salutation-form 67', and the arm is carried by a lever 71', which is fastened on a rock-shaft 72'. A two-arm lever 73' is also fastened on this shaft 72', and the trigger 74' is pivoted at 75' and extends above the shaft 72'. The trigger is provided with a shoulder 76' below the plane of the shaft 72' and with a shoulder 76'' above the plane of said shaft, and a spring 80' is fastened at 80'' to the frame and is adapted to be connected to either end of the lever 73' by a pin 95, which enters the openings 95' and 95''. When the pin is arranged in the opening 95' in the lower arm of the lever 73', the spring will pull the pin against the shoulder 76' of the trigger and hold the movable letter "s" normally in printing position, Fig. 11, and when the pin is arranged in the opening 95'' in the upper arm of the lever the spring will pull the pin against the

shoulder 76" on the trigger and cause the lever 71' to hold the movable letter "s" normally out of printing position. By constructing the machine in this way it can be used in connection with singular or plural addresses only or some of each, and it can be quickly adjusted, as occasion may require, for operation in connection with address-lists which predominate in singular or plural addresses.

In this construction, as in that shown in Figs. 8 to 10, the lower end 77' of the trigger is engaged by a projection 78' on the address-form 50' to operate the trigger and the devices connected therewith. In Fig. 11 the letter "s" is held normally in printing position, and the projections would be located on singular address-forms for the purpose of operating the trigger to move the letter "s" out of printing position. In Figs. 12 and 13 the letter "s" is held normally out of printing position, and the projections would be located on the plural address-forms to move the letter "s" into printing position. A paper-holder 81 is pivoted at 82 on the platen, and an arm 83 on each side thereof carries an antifriction-roller 84, which travels on a curved track on the main frame and is held in operative position by the spring 86. This paper-holder carries a flat plate 87, which covers the address-form in front of the arm 66 during the printing operation to prevent it from making an impression on the sheet.

A date-form 88, Fig. 2, is carried by a plate 89, adjustably mounted on the bed, and this form and the singular salutation-form may be made up of type set in a tray like the body-form 46, or these forms can be molded on a strip of rubber and pasted or otherwise affixed to the plates 89 and 68, respectively.

The machine is of comparatively simple construction and operates automatically in general respects substantially similar to an ordinary job-printing press, printing the body of the letter, the date, a separate address, and the proper salutation therefor on a sheet at each operation of the machine. The body of the letter may also contain the writer's name in type, or an imitation signature may be provided, or this may be omitted and the signature written after the letter is printed. By thus inking the address-forms at the same time that the body-form is inked and printing both the address and the body in one operation I produce a printed letter which may be made to very closely imitate a type-written letter if type and ink of the proper kind are employed, and the character of the impression throughout the address and body of the letter will be uniform. Various means may be employed for adjusting the parts of the machine to secure the proper impression, and for this purpose the roller 59 may be eccentrically mounted in some well-known manner which it is unnecessary to describe in detail, as it forms no part of the present invention. It

will be understood, of course, that the sheets are placed one at a time in proper position on the platen and carried thereby into printing position and that after each printing operation a new address-form is automatically brought up into printing position and the salutation-form changed whenever required by the character of the address.

While I have referred to the chain as made up of address-forms, it will be apparent that these forms may be made to print any other desirable subject-matter than the address without departing from the invention, and by referring to these forms as "address-forms" in the specification and claims it will be understood that I do not restrict the invention specifically to forms which print an address.

Without limiting myself to the exact construction and arrangement of parts herein shown and described, what I claim, and desire to secure by Letters Patent, is—

1. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, means for moving said drum rearward and forward after each printing operation, and means for turning the drum during said movement to bring a new address-form into printing position.

2. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, a pivoted frame carrying said drum, means for oscillating the frame after each printing operation to move the drum rearward out of printing position and forward into printing position, and means for operating the drum to bring a new address-form into printing position during each complete movement of said oscillating frame.

3. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, means for moving said drum out of and into printing position, and means engaged by the drum during said movement to turn the drum and bring a new address-form into printing position.

4. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, means for moving said drum out of and into printing position, and devices located in the path of movement of said drum to be engaged thereby to turn the drum and bring a new address-form into printing position.

5. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, means for moving said drum out of and into printing position, and a pair of devices located in the path of movement of said drum to turn the drum and bring a new address-form into printing position, one of said devices being engaged by the drum on its rearward movement and the other being engaged by the drum on its forward movement.

6. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, means for moving said drum out of and into printing position, and a pair of pawls one of which engages the drum on its rearward movement and the other on its forward movement to turn the drum and bring a new address-form into printing position.

10 7. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain and provided with recesses, means for moving said drum into and out of printing position, and
15 devices arranged in the path of movement of the drum to enter said recesses and turn the drum to bring a new address-form into printing position.

20 8. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain and provided with recesses, means for moving said drum into and out of printing position, and a pair of pawls arranged in the path of movement of the drum and provided with projections to enter said recesses and turn the drum to bring a new address-form into printing position.

30 9. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain and provided with recesses, means for moving said drum out of and into printing position, and a pair of pawls adapted to be engaged by said drum
35 to turn the drum and bring a new address-form into printing position, one of said pawls being provided with a projection to engage a recess in the drum on its rearward movement and the other having a projection to engage a recess in the drum on its forward movement.
40

10. In a printing-machine, the combination of a platen, a fixed form, a chain of address-forms, a drum carrying said chain, a pair of
45 pawls located behind the drum, and means for moving said drum rearward out of printing position and forward into printing position and into engagement alternately with said pawls to thereby turn the drum and bring
50 a new address-form into printing position.

11. In a printing-machine, a platen, a form for printing the body of a letter, a number of address-forms, means for bringing said address-forms successively into printing position, a salutation-form, and means for changing said salutation-form as each address-form requires.
55

12. In a printing-machine, the combination of a platen, a form for printing the body of a letter, a number of address-forms, means for bringing said address-forms successively into printing position, a salutation-form, and means operated by an address-form for changing said salutation-form as such address requires.
60 65

13. In a printing-machine, a platen, a form for printing the body of a letter, a number of address-forms, means for bringing said address-forms successively into printing position, a form for printing the salutation "Dear
70 Sirs:", and means for automatically moving the final letter "s" in said salutation-form out of printing position.

14. In a printing-machine, a platen, a form for printing the body of a letter, a number of
75 address-forms, means for bringing said address-forms successively into printing position, a form for printing the salutation "Dear Sirs:", and means operated by the address-form for moving the final letter "s" in said
80 salutation-form out of printing position as the address to be printed requires.

15. In a printing-machine, the combination of a platen, a form for printing the body of a letter, a number of address-forms, means for
85 bringing said address-forms successively into printing position, a salutation-form for printing "Dear Sirs:", an arm carrying the final letter "s" in said salutation-form, and a trigger adapted to be operated by an address-form requiring a "Dear Sir:" salutation to retract said arm and thus carry the letter "s" thereon out of printing position.
90

16. In a printing-machine, the combination of a platen, a form for printing the body of a letter, a number of address-forms, means for
95 bringing said address-forms successively into printing position, a projection on each address-form requiring the salutation "Dear Sir:", a form for printing the salutation "Dear
100 Sirs:", an arm carrying the final letter "s" in said salutation-form, a lever carrying said arm, and a trigger adapted to be operated by the projection on the address-forms requiring the "Dear Sir:" salutation to operate said
105 lever and move the final letter "s" in said salutation-form out of printing position.

17. In a printing-machine, the combination of a platen, a form for printing the body of a letter, a chain of address-forms, a projection
110 on each address-form requiring the salutation "Dear Sir:", a drum carrying said chain, means for moving said drum rearward and forward after each printing operation, means for turning said drum during said movement to
115 bring a new address-form into printing position, a form carrying the salutation "Dear Sirs:", an arm carrying the final letter "s" in said salutation-form, and a trigger connected to said arm and adapted to be operated by
120 the projection on a form requiring the salutation "Dear Sir:" as it is carried forward into printing position by said drum to prevent the final letter "s" in said salutation-form from printing.
125

18. In a printing-machine, the combination of a platen, a form for printing the body of a letter, a chain of address-forms, a drum carrying said chain and arranged to hold one of the address-forms in printing position beneath
130

said body-form, inking-rollers, means for operating said rollers to ink the body-form and address-form in printing position, and means for holding the next address-form in the chain 5 in position to be inked by the rollers at the same time that the address-form in printing position is inked.

19. In a printing-machine, the combination of a platen, a form for printing the body of a 10 letter, a chain of address-forms, a drum carrying said chain, means for bringing said address-forms successively into printing position on the drum, means for inking the body-form, the address-form in printing position 15 and the next address-form in the chain, and means for covering said next address-form during the printing operation to prevent it from printing on the sheet.

20. In a printing-machine, the combination 20 of a platen for carrying the sheet into printing position, a form for printing the body of a letter, a chain of address-forms, a drum carrying said chain, means for operating said drum after each printing operation to bring 25 a new address-form into printing position, means for inking the body-form, the address-form in printing position and the next address-form in the chain, a device for holding the sheet on the platen while moving into and out

of printing position, and a plate carried by 30 said device to cover the next address-form during the printing operation.

21. In a printing-machine, the combination of a platen, a form for printing the body of a 35 letter, a form for printing a salutation for the letter, and means for automatically changing said salutation-form to print a singular or a plural salutation.

22. In a printing-machine, the combination of a platen, a form for printing the body of 40 a letter, a form for printing the salutation "Dear Sirs:", and means for automatically changing said salutation-form to print "Dear Sir:".

23. In a printing-machine, the combination 45 of a platen, a form for printing the body of a letter, a form for printing the salutation-form "Dear Sirs:", a chain of address-forms, a projection on each address-form requiring a singular salutation, and means adapted to be 50 operated by said projections to prevent the final letter "s" in said salutation-form from printing.

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