J. J. NAGLE.

DUPLICATING MACHINE.

APPLICATION FILED FEB. 10, 1910.

989,720.

Patented Apr. 18, 1911.

3 SHEETS—SHEET 1.

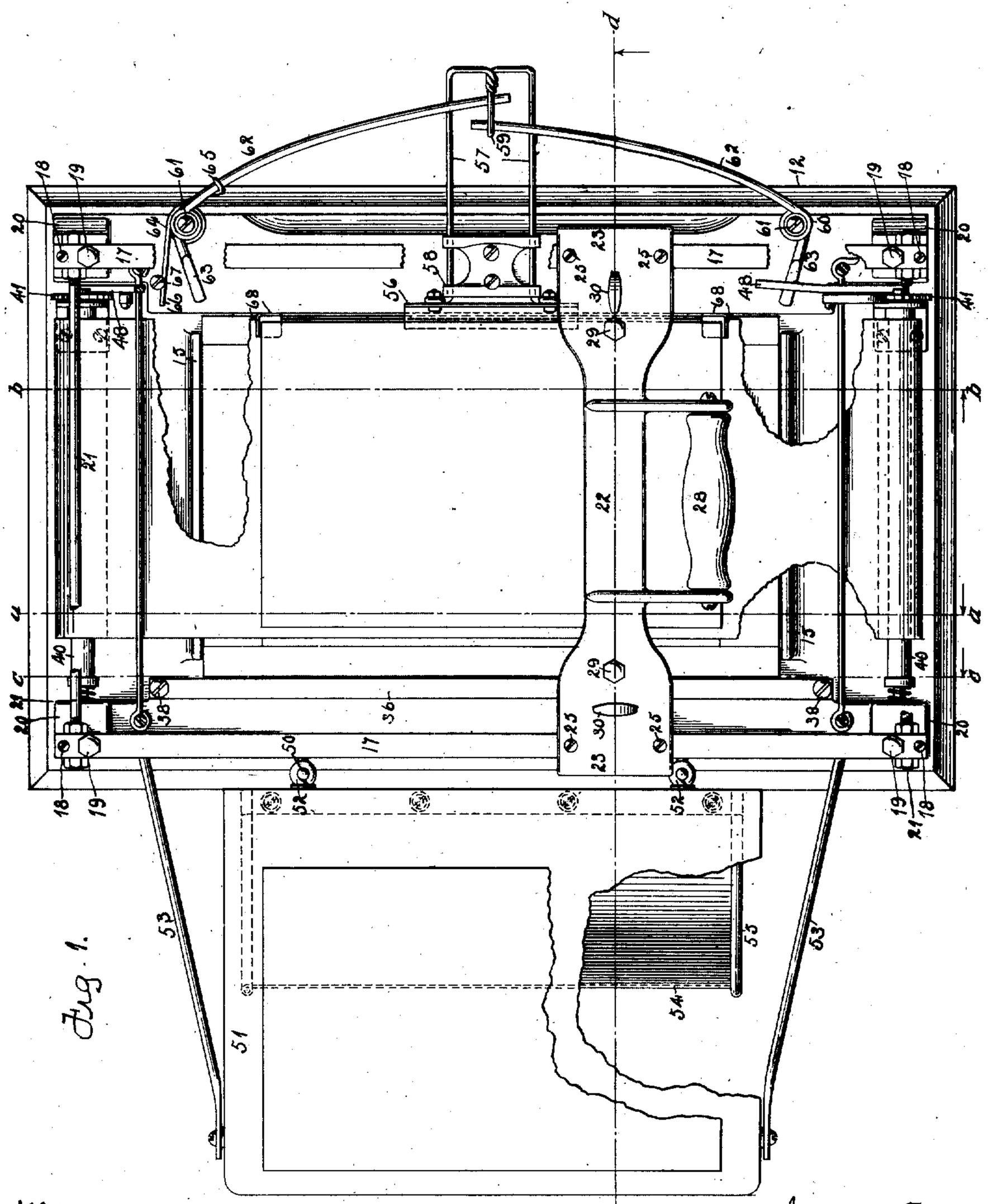

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

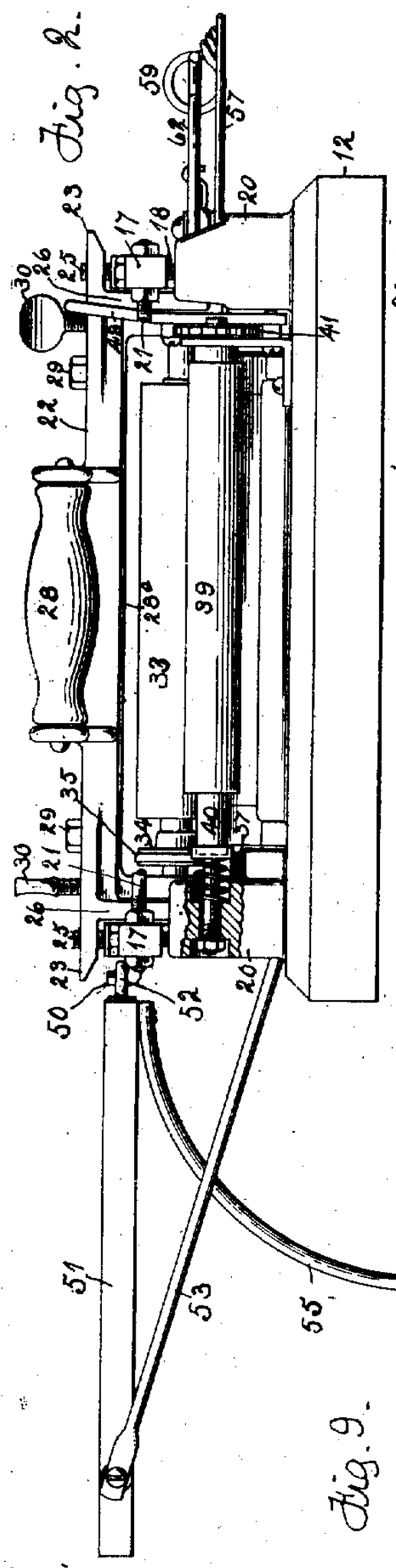

Fig. 3.

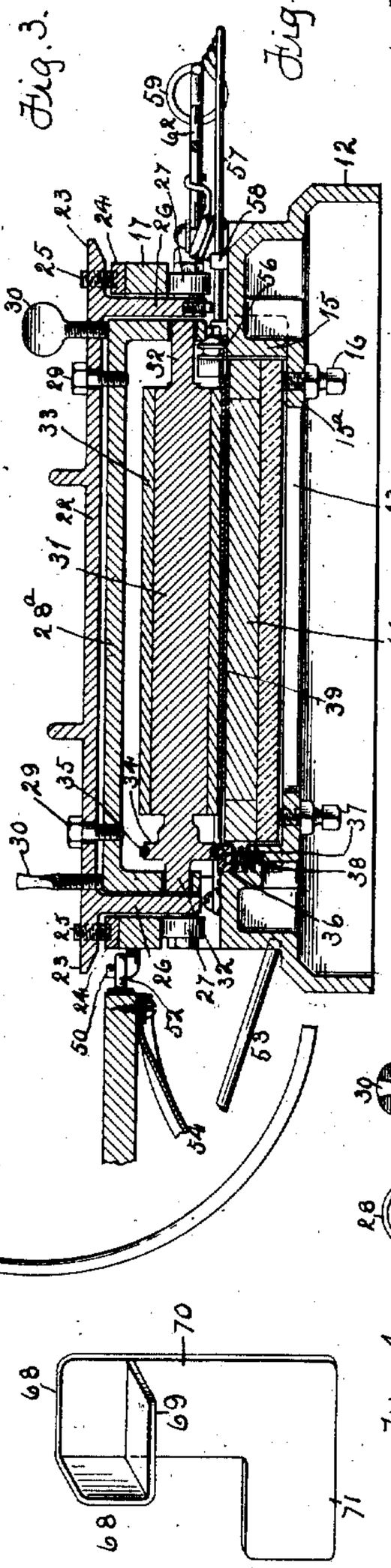

Fig. 10.

Fig. 11.

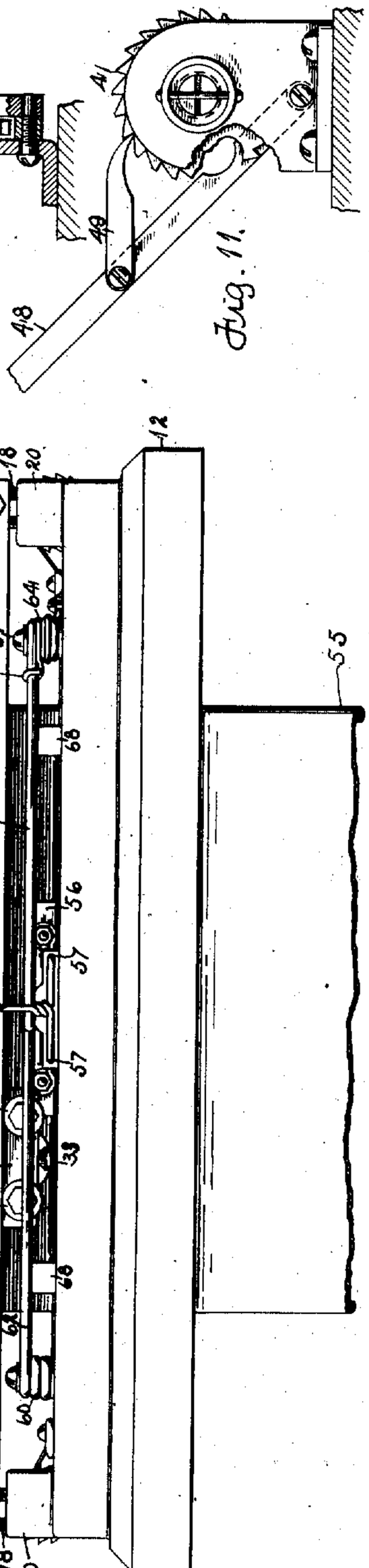

Fig. 9.

Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5.

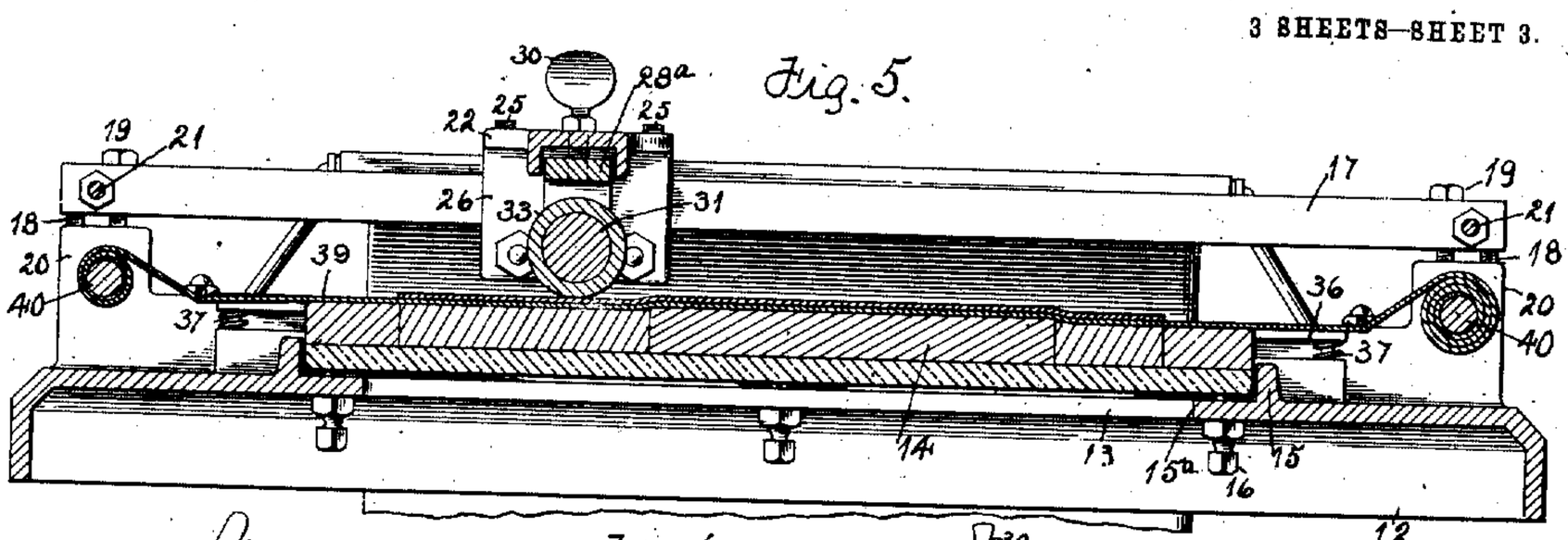


Fig. 6.

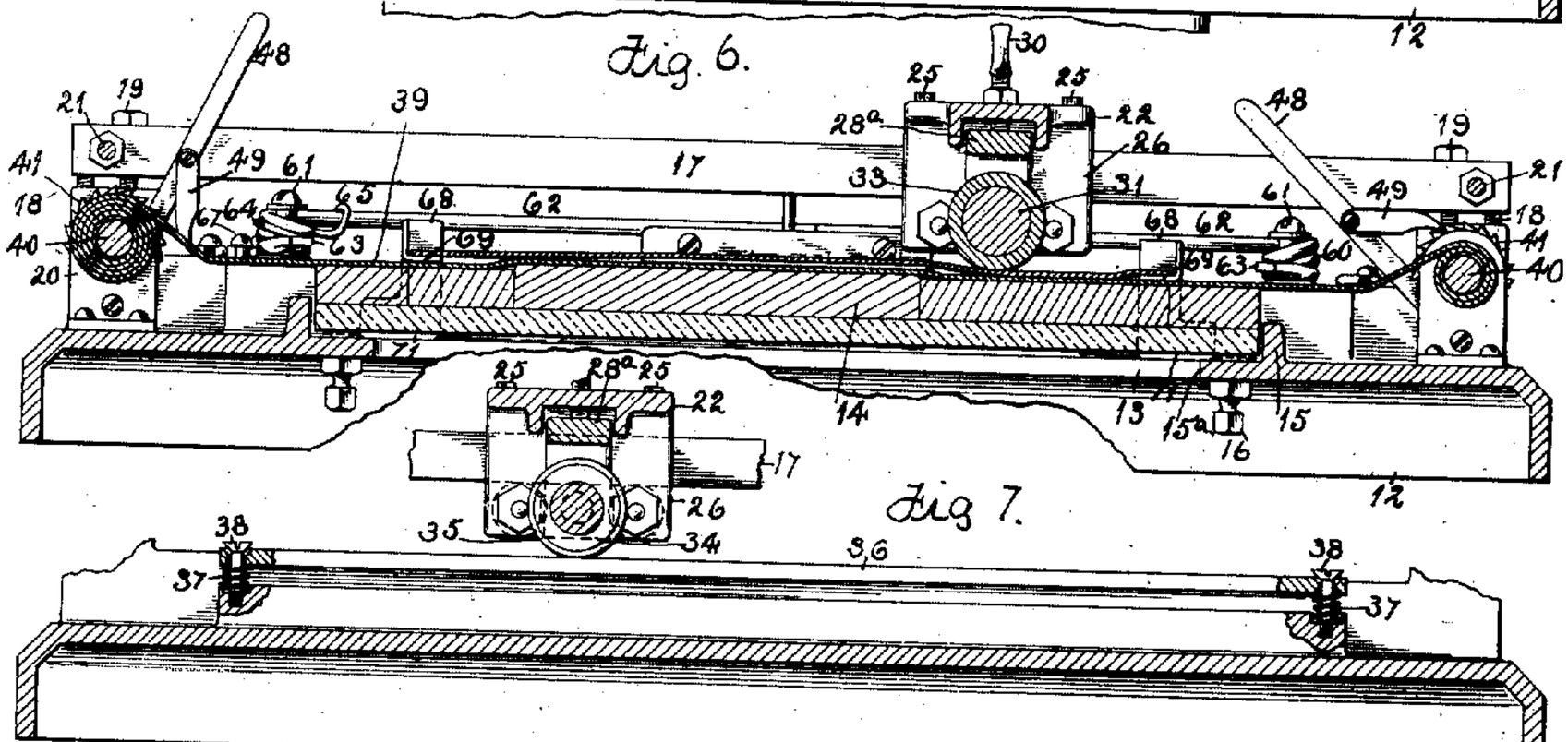
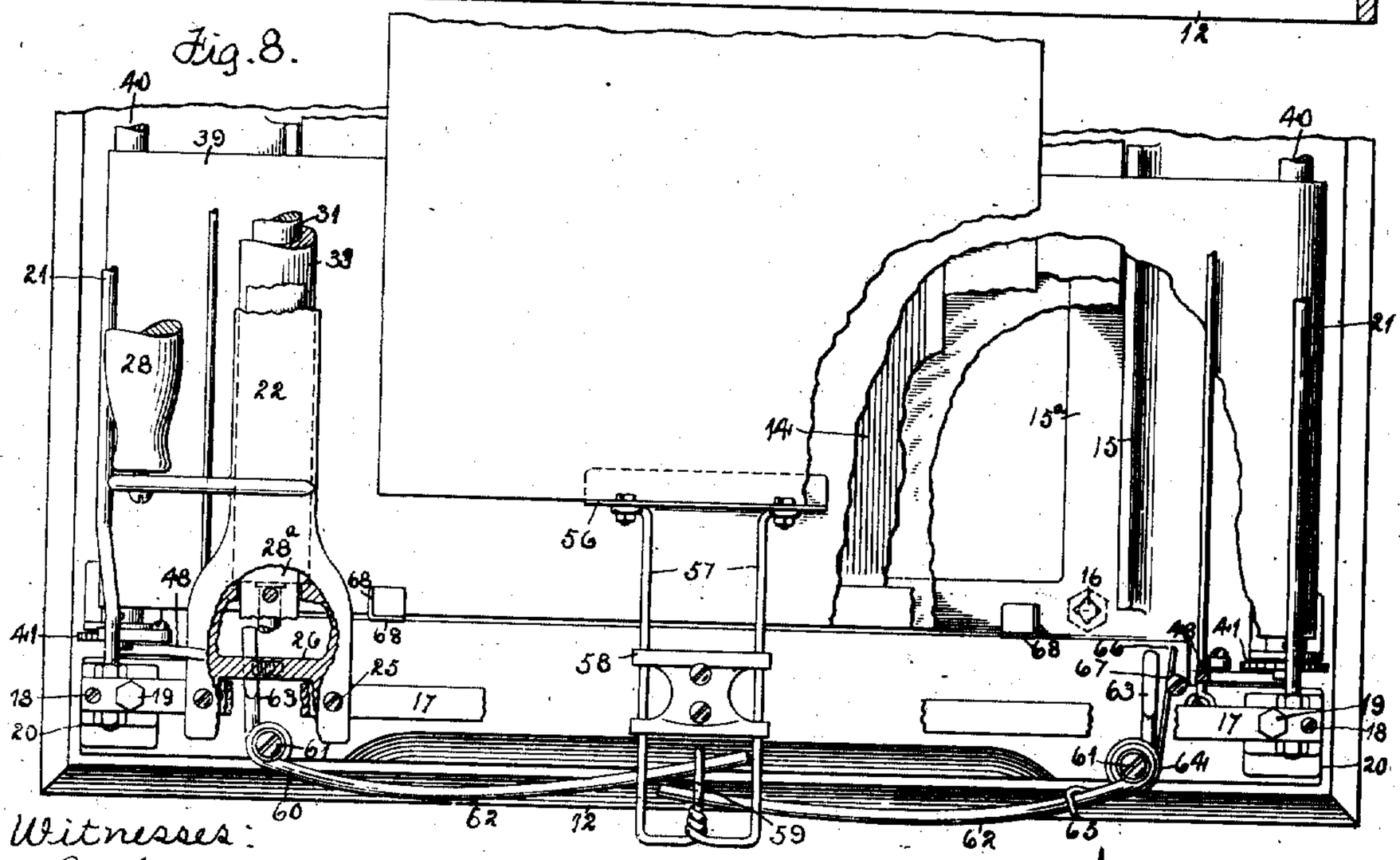


Fig 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

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DUPLICATING-MACHINE.

989,720. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed February 10, 1910. Serial No. 543,166.

To all whom it may concern:

Be it known that I, JOHN J. NAGLE, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Duplicating-Machines, of which the following is a specification.

The present invention relates to machines for printing, and more particularly those employed for duplicating letters and like literature to simulate type-written matter.

The primary object is to provide an exceedingly simple machine, by means of which duplicate copies can be produced with ease and expedition, the mechanism being adjustable in order that the highest degree of efficiency and work can be secured.

In the drawings:—Figure 1 is a plan view of the machine, portions thereof being broken away. Fig. 2 is an end elevation. Fig. 3 is a sectional view on the line *d*—*d* of Fig. 1. Fig. 4 is a rear elevation. Fig. 5 is a longitudinal sectional view on the line *a*—*a* of Fig. 1. Fig. 6 is a sectional view on the line *b*—*b* of Fig. 1. Fig. 7 is a sectional view on the line *c*—*c* of Fig. 1. Fig. 8 is a plan view of a portion of the machine, with parts broken away, and illustrating the sheet discharging means in operation. Fig. 9 is a detail perspective view of one of the paper gages. Fig. 10 is a detail sectional view of one of the ribbon winding drums. Fig. 11 is a side elevation of the same.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, a rectangular base or bed 12 is employed, having a central opening or seat 13 for the reception of the form shown generally at 14. This opening is surrounded by vertical walls 15, carrying at their lower edges inwardly extending flanges 15ª, and through said flanges are threaded adjusting screws 16 constituting supports for the form. The bed is provided with spaced longitudinally disposed, elevated track rails or bars 17 that rest upon adjustable supporting screws 18, and being held thereon by fastening screws 19 that pass therethrough into upstanding lugs 20 formed upon the ends of the bed. Tie rods 21 connect the ends of these rails or bars.

A reciprocatory carriage frame 22 operates on the rails or bars 17, and has outstanding flanges 23 that overhang the said rails or bars. Shoes 24, operating against the upper sides of the rails or bars 17, are adjustably secured to the carriage frame by screws 25. Said carriage frame also has depending flanges 26 carrying rollers 27 that ride against the under sides of the rails or bars. A handle grip 28, secured to one side of the carriage frame, constitutes convenient means for manually reciprocating the same. This carriage frame supports an adjustable yoke 28ª that is located between the depending flanges 26, and is suspended from said carriage frame by screws 29 having adjustably threaded engagements with the yoke. Clamping screws 30, threaded through the carriage, bear against the yoke. An impression roller 31 has gudgeons 32 loosely journaled in the depending arms of said yoke, and this roller is provided with a peripheral blanket or surface 33 of yielding material that operates over the form. One of the gudgeons 32 is furthermore provided with an actuating wheel 34 having a peripheral non-slipping tire 35 that runs upon an adjustable track 36 mounted on the bed. This track is yieldingly supported by coiled springs 37 arranged beneath the same and surrounding adjusting screws 38 that pass through the track, and are threaded into the bed.

A ribbon, as 39, is interposed between the form and impression member, and said ribbon is wound in opposite directions on reels or drums 40 journaled on the ends of the bed. The said drums 40 have oppositely disposed ratchet wheels, and actuating levers 48, fulcrumed at the ends of the bed, have dogs 49 that can be engaged with the ratchet wheels to actuate the same and thereby effect a step-by-step rotation of the drums. These levers 48 are disposed in the path of and are operated by the carriage upon its reciprocation. Only one of the dogs 49 is placed at a time in active position, the other being disengaged from its ratchet wheel, as will be clear by reference to Fig. 6.

One of the track members 17 is provided on its outer side with a pair of outstanding pintles 50, and a paper feed table 51, has eyes 52 detachably engaged with said pintles. The outer side of this table is supported by brace rods 53 secured thereto and bearing against the adjacent side of the bed. Secured to the under side of this table, is a paper deflecting sheet 54, preferably formed of a metal plate, the margins of which are

secured to reinforcing wires 55. The paper to be printed is placed upon the table, and the sheets are fed successively therefrom on to the form. After the printing action, the sheet is discharged against the directing plate 54, and this discharging operation is obtained by the following mechanism. A flanged or angle plate 56 reciprocates over the form at right angles to the direction of movement of the carriage, and secured to the rear side thereof, is a yoke composed of parallel bars 57 that slide through a guide bracket 58 secured to the rear side of the bed. This yoke is provided at its rear end with a forwardly extending eye 59, and bell crank levers 60 fulcrumed on the bed at 61, have oppositely extending arms 62 that engage the eye 59. These bell crank levers also have inwardly extending short arms 63 disposed in the path of and operated by the carriage on its reciprocation. A spring 64, coiled about one of the fulcrums 61, has an arm 65 engaged with one of the arms 62, and has another arm 66 bearing against a suitable stop 67.

The position of the paper is governed by gages consisting, as shown in Fig. 9, of angularly disposed side walls or flanges 68, and a bottom 69. Each gage has a depending tongue 70 provided with a terminal offset 71. Two of the gages are employed that are disposed on opposite sides of the discharging device 56, and have the tongues or strips 70—71 interposed between the rear edge of the form 14 and the adjacent wall 15 of the socket, as shown in Fig. 3.

Briefly described, the operation of the device is as follows: When the carriage is at one end of the bed, a sheet of paper is taken from the table and placed over the form, being properly positioned by the gages. The carriage is then moved over the bed and the roller will consequently press the paper and ribbon against the type of the form in a manner well understood, the rotation of the roller being insured by the tire 35 of the wheel 34 operating on the track 36. The pressure of this wheel is governed by adjusting said track and the pressure of the roller is suitably adjusted by means of the yoke 28 carrying the same. After the impression roller has moved from the form, the carriage will strike one of the instanding arms 63, and the device 56 will consequently push the printed sheet transversely from the bed, as indicated in Fig. 8, this sheet being directed by the member 54 into a suitable receptacle. To describe the operation more specifically, it may be stated that when the carriage strikes the short arm 63, it will of course effect a quick movement of the part 56, due to the long arm 62 of the bell crank. As a result of the momentum thus acquired, the sheet will continue its movement from the bed of the machine, even after the part 56 has stopped. It is therefore unnecessary for said part 56 to move the entire distance across the bed of the machine. The carriage passes the said arm 63, and thereupon the spring 64 will react to return the discharging device 56 to its original position. The carriage also will strike the actuating lever 48, and thus cause a partial rotation of one of the ribbon winding drums, consequently bringing a fresh portion of the ribbon over the type. Another sheet is now placed in position, and the carriage is drawn back, whereupon a second impression will be made, and the above described operation repeated, with the exception that on the return movement, the other ribbon drum will not be operated. Of course when the ribbon has been completely wound on one drum, the dog coacting with the ratchet wheel thereof is disengaged and the other drum is thrown into operation, whereupon the ribbon will be rewound.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a machine of the character set forth, the combination with a bed, of a reciprocatory carriage operating thereover, a yoke adjustably associated with the carriage, adjustable stop screws mounted on the carriage and bearing against the yoke, suspending screws adjustably connecting the carriage and yoke, and a roller journaled in the yoke and operating over the bed.

2. In a machine of the character set forth, the combination with a bed, of a reciprocatory carriage operating thereon, a yoke adjustably connected to the carriage, a roller journaled on the yoke and movable with the carriage, said roller having a wheel provided with a non-slipping tire, and an adjustable yielding track carried by the bed and engaged by the tire.

3. In a machine of the character set forth, the combination with a bed having longitudinally disposed elevated tracks thereover, of a reciprocatory carriage having shoes and rollers that engage opposite sides of the tracks, an adjustable yoke mounted on the carriage, an impression roller journaled on the yoke, and a spring supported track engaging the roller for insuring its rotation upon the reciprocation of the carriage.

4. In a machine of the character set forth, the combination with a bed, of an impres-

sion member operating thereover, a reciprocatory flanged sheet delivering device that moves over the bed transversely of the direction of movement of the impression member, said device having a yoke provided with an eye, and a swinging actuating lever for the device having angularly disposed arms, one of which is engaged in the eye, and the other of which is disposed in the path of the impression member.

5. In a machine of the character set forth, the combination with a bed, of a reciprocatory impression member operating thereover, a sheet discharging device operating transversely over the bed and having a yoke provided with an eye, and oppositely arranged spring actuated bell cranks having arms engaged with the eye and also having arms disposed on opposite sides of and in the path of movement of the impression member.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN J. NAGLE.

Witnesses:
STEPHEN C. NAGLE,
WALTER R. MANSFIELD.