

No. 612,705.

Patented Oct. 18, 1898.

D. S. CLARK.

GRIPPER FOR PRINTING PRESSES, &c.

(Application filed June 1, 1897.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 2.

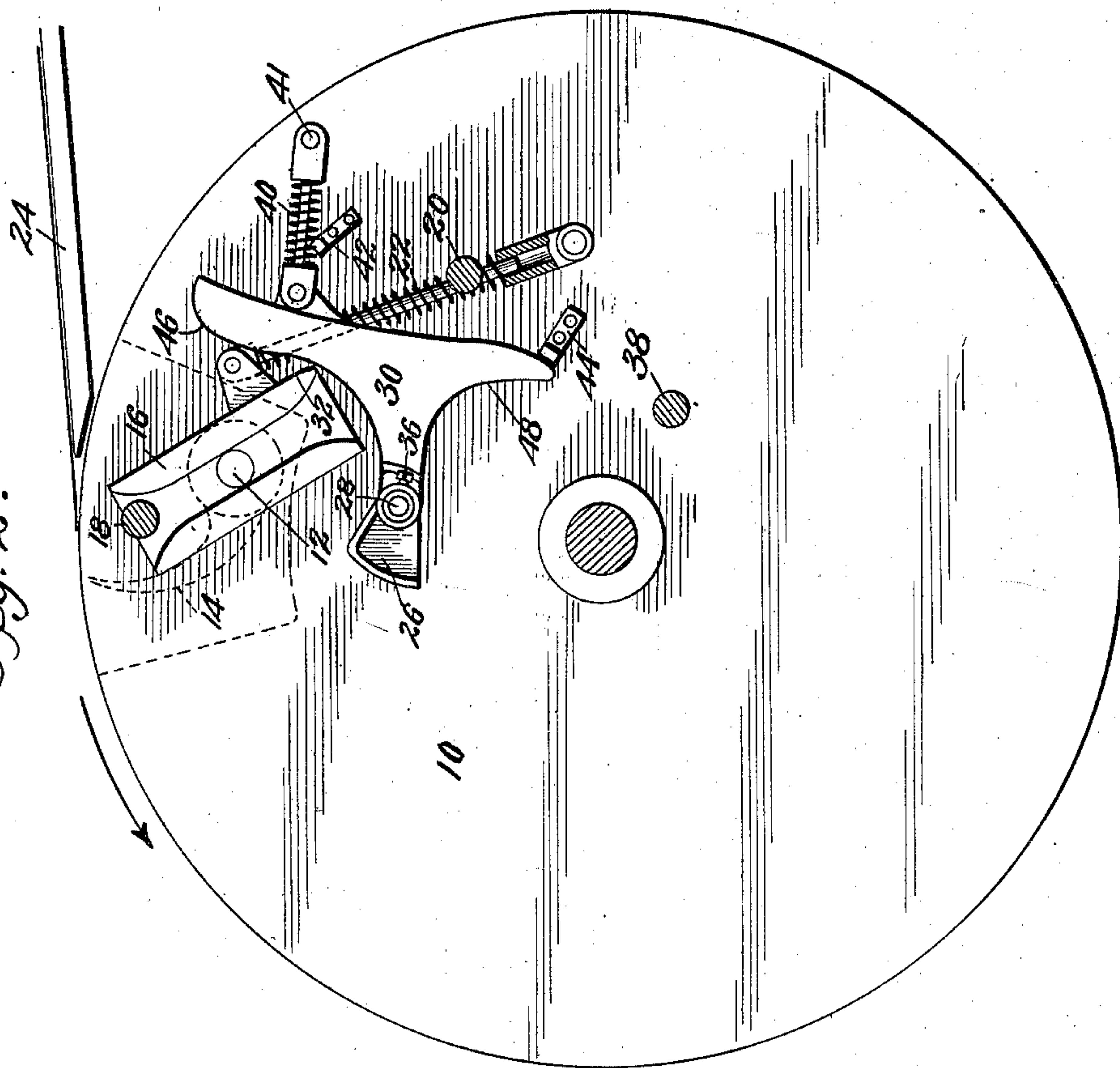
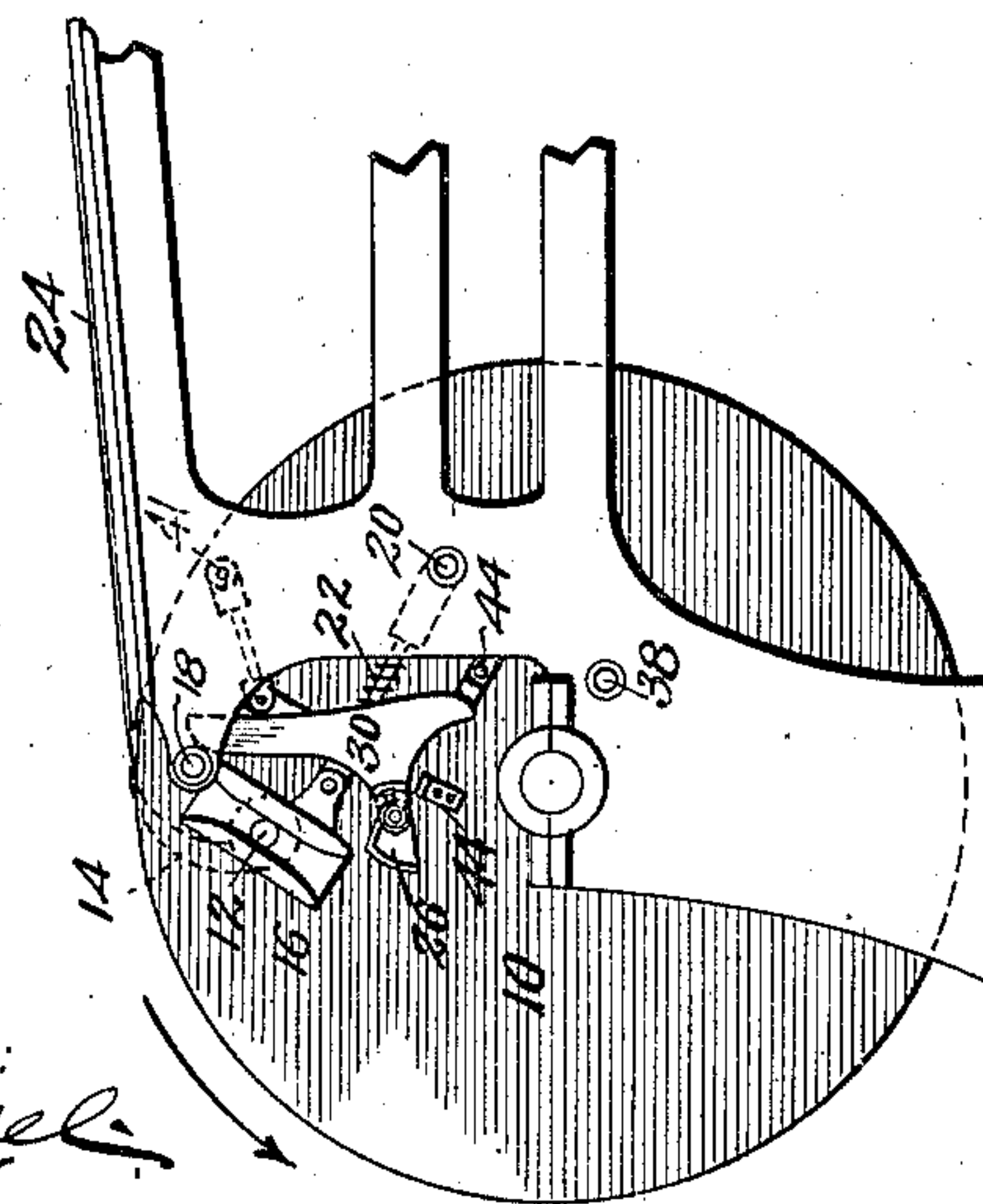


Fig. 1.



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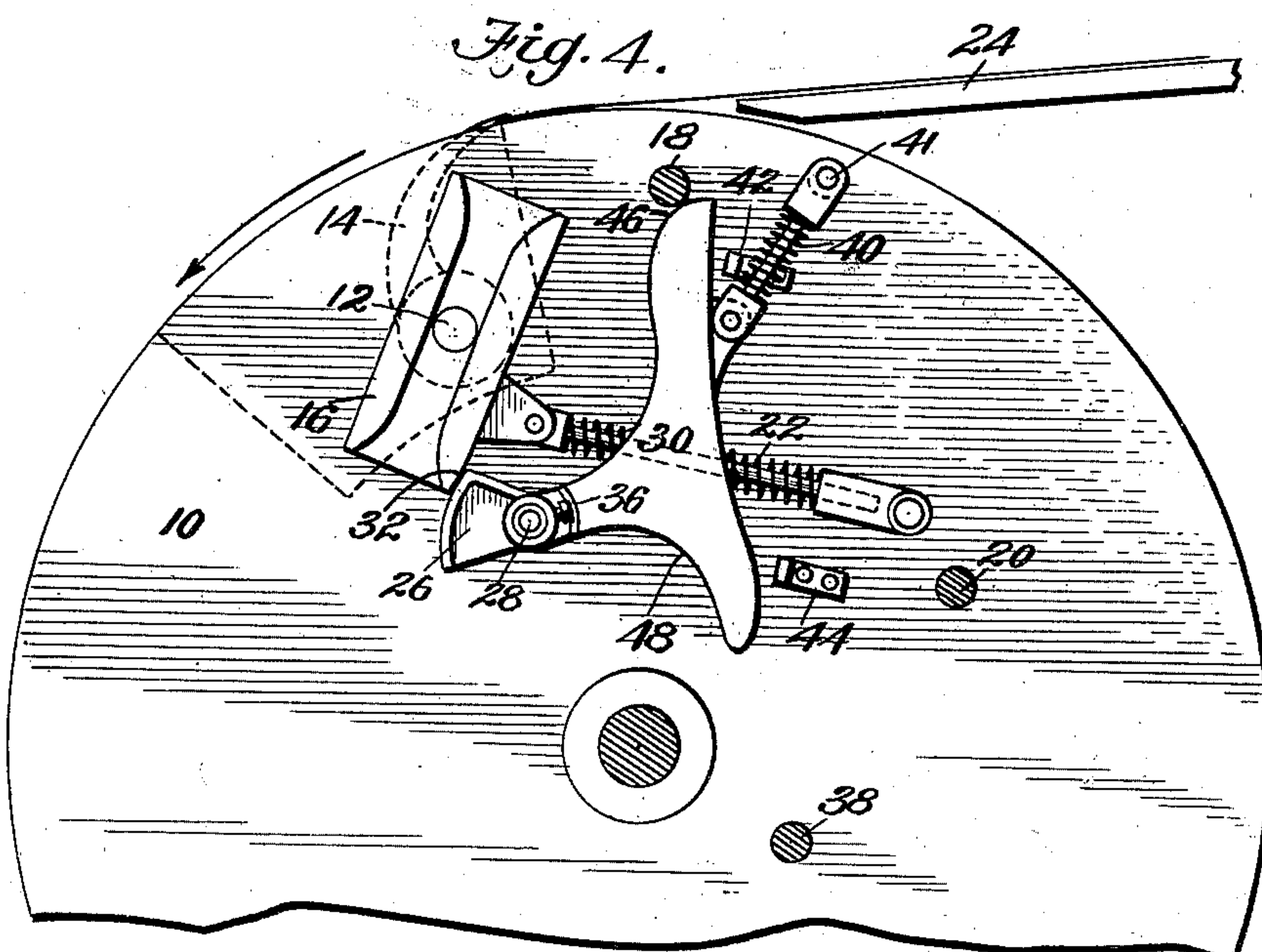
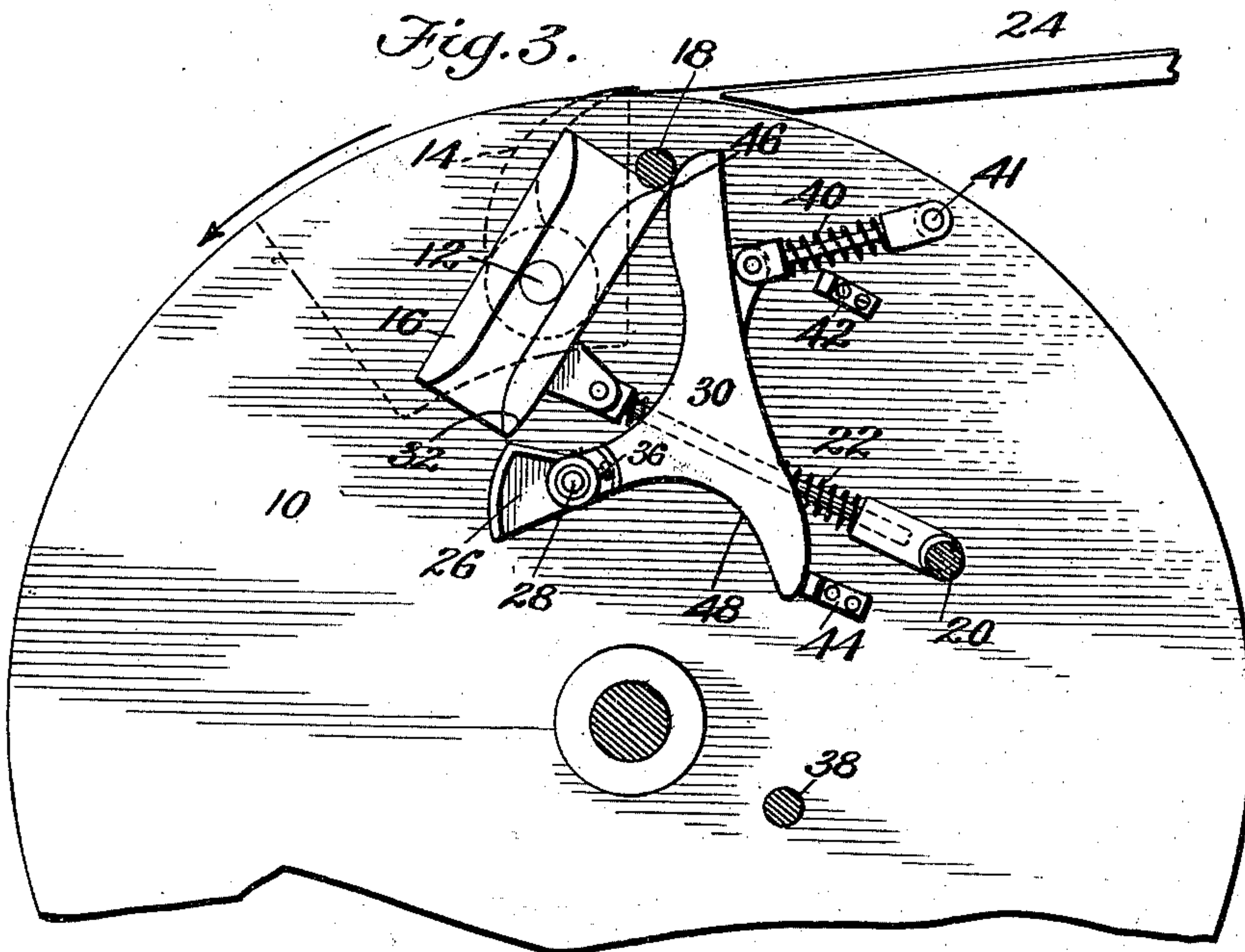
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(Application filed June 1, 1897.)

(No Model.)

3 Sheets—Sheet 2.



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(No Model.)

3 Sheets—Sheet 3.

Fig. 6.

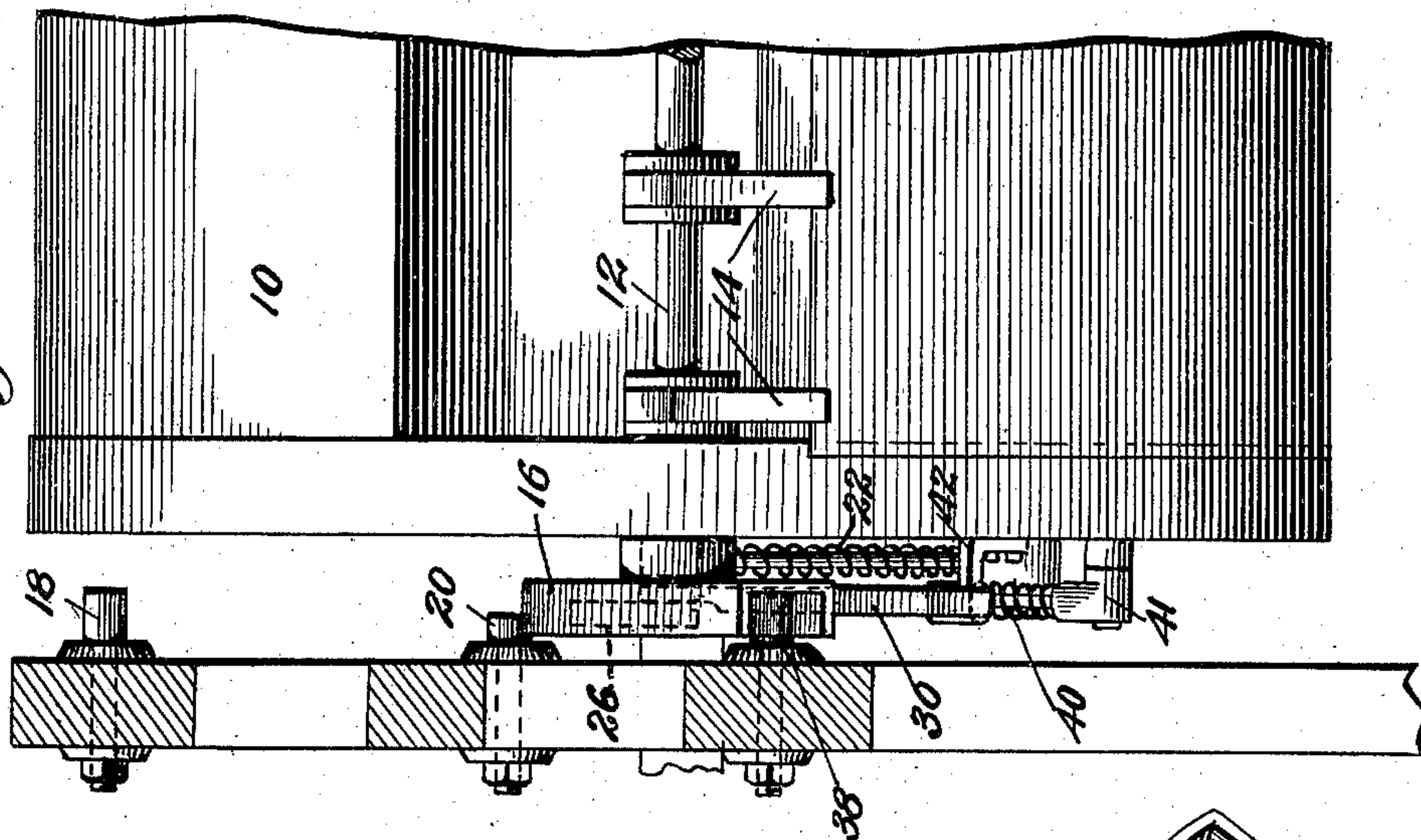


Fig. 5.

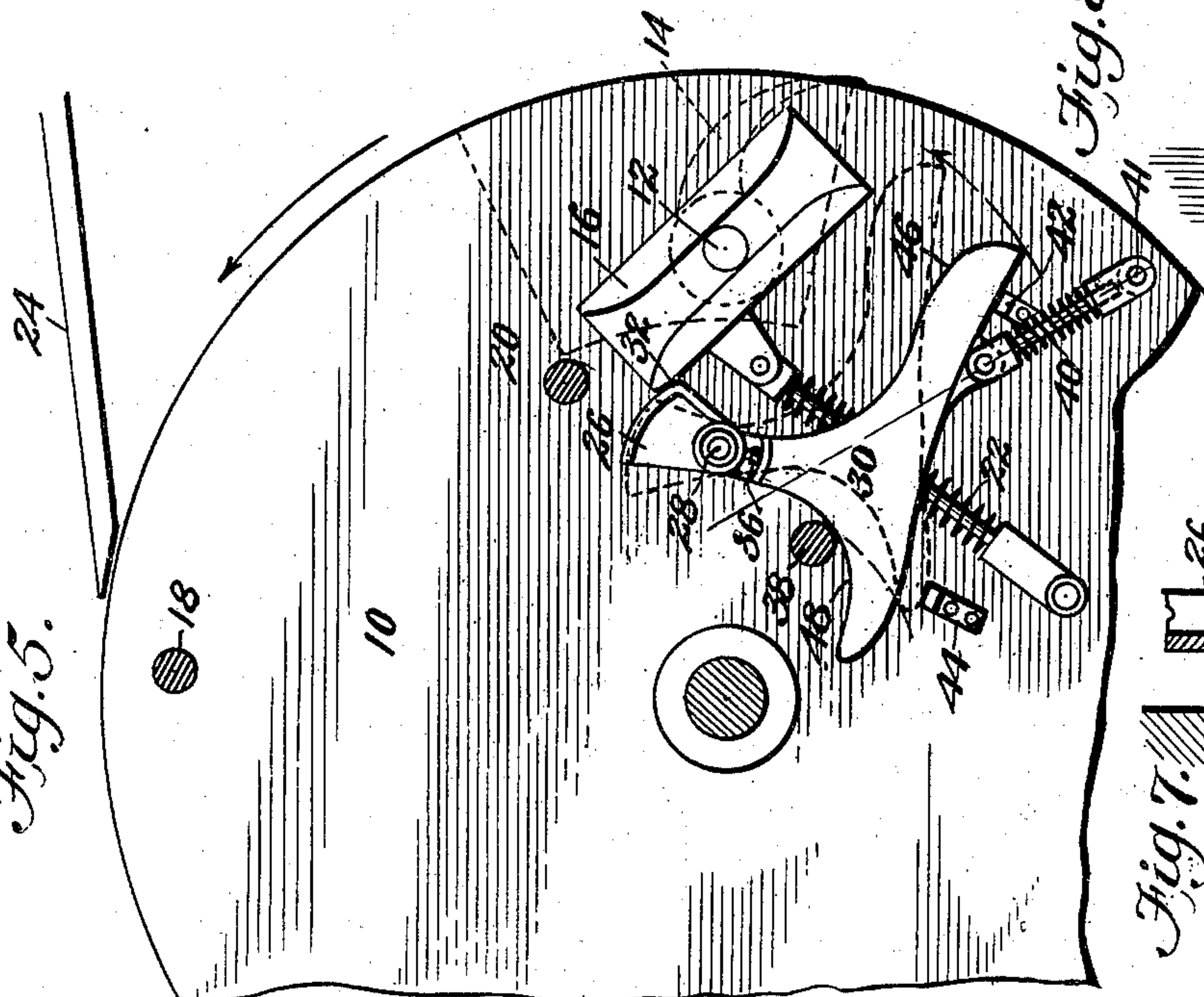


Fig. 8.

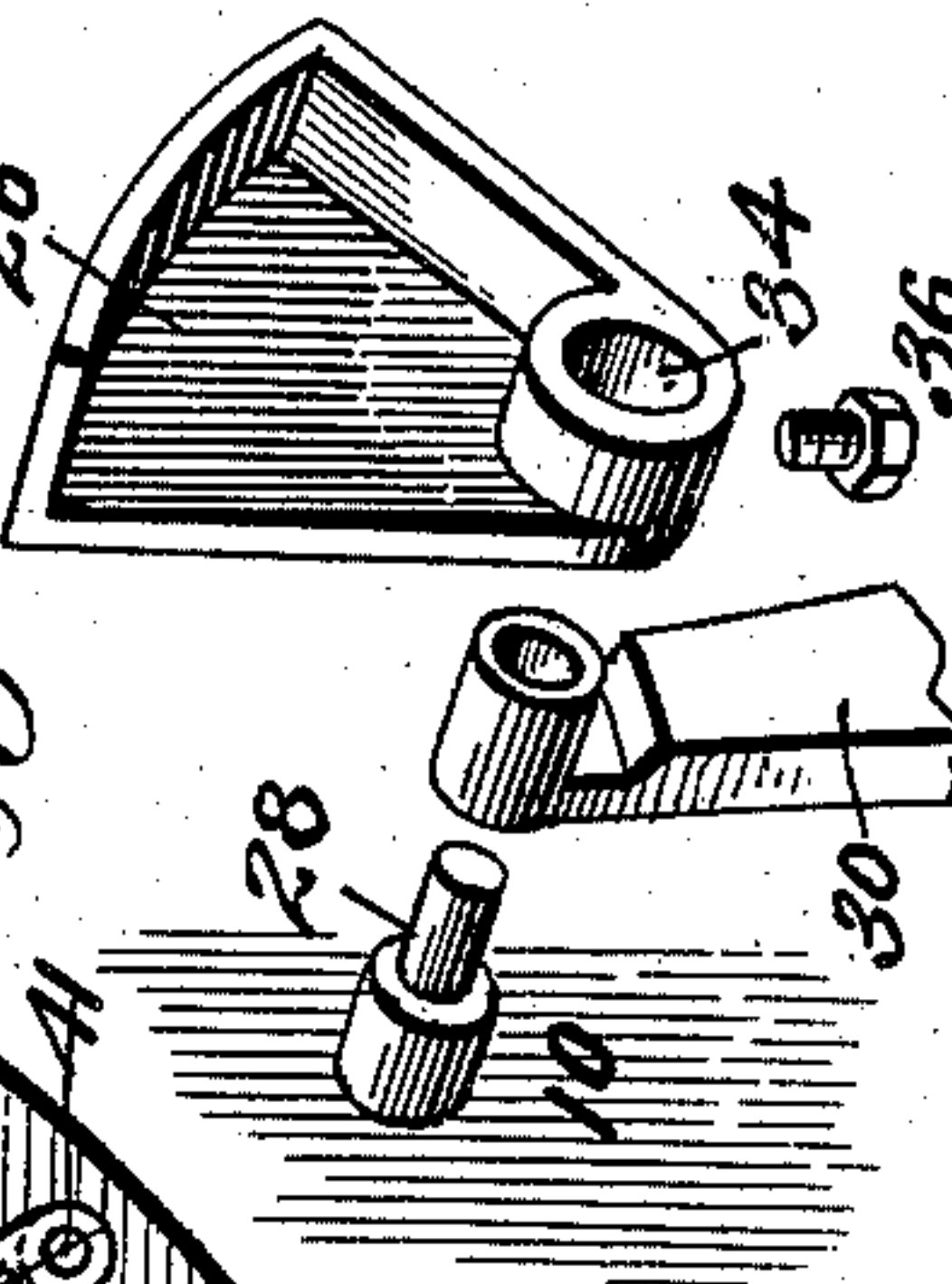
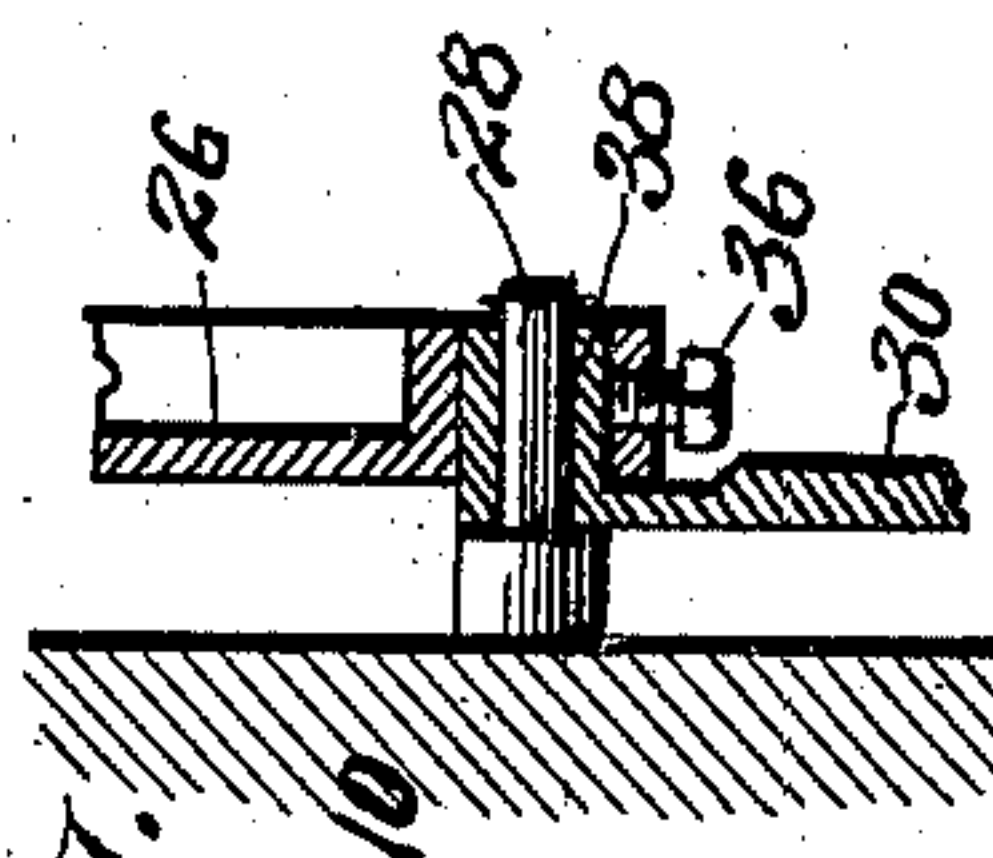


Fig. 7.



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UNITED STATES PATENT OFFICE.

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GRIPPER FOR PRINTING-PRESSES, &c.

SPECIFICATION forming part of Letters Patent No. 612,705, dated October 18, 1898.

Application filed June 1, 1897. Serial No. 638,995. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT S. CLARK, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Grippers for Printing-Presses and Like Machines, of which the following is a specification.

This invention is related to a large number of devices for seizing and transporting sheets of paper from a feed-board through a printing-press, bronzer, or similar machine to which paper is fed; and it is more especially designed to make the seizure and grasp of a sheet more certain and precise than usual. Apparatus of the sort hitherto employed consists, in practically all cases, of a number of thin bent fingers fast to a rocking shaft concealed and journaled within a suitable gap in the periphery of an impression or analogous cylinder. These gripper-fingers are so adjusted that the partial revolution of the shaft that carries them closes their thin ends upon the leading edge of a sheet of paper presented to them and carries it with the revolving cylinder, or, having already held a sheet, they are thrown back into the gap out of the way and the sheet is let go for delivery. As is well known in the case of a gripper mechanism of this kind, certain irregularities occur which are partly due to the forward impulse which the gripper-fingers give to the sheet of paper at the moment they fall upon it (inasmuch as the impact is by no means radial) and partly to the unevenness in the paper as it lies at the edge of the gap. These causes of irregular seizure are greatly increased when the spring which closes the grippers is made quick and powerful in action and when the stock to be handled is stiff and unyielding in its nature and has to be held down with a strong pressure. In my invention I counteract such evils by closing the gripper-fingers, not at a single blow, but by two impulses, the first actuated by a very feeble pressure and the second immediately after it by a relatively heavy pinch on the paper, which holds it immovable.

In the diagrammatic drawings which are part of this specification, Figure 1 shows in elevation the end of an impression-cylinder

and part of the press-frame with the necessary apparatus attached, the position being such that the closed grippers are just about to receive the second impulse. In Fig. 2 a similar elevation on a much larger scale represents the open gripper just before it first closes on the paper. Fig. 3 is an enlarged view similar to Fig. 1. Fig. 4 shows the position of the gripper apparatus after the second pinch upon the paper has begun. Fig. 5 shows the moment when the releasing of the second pinch takes place, to be followed by the opening of the gripper-fingers immediately afterward. Fig. 6 is a plan view of part of the cylinder with the gripper apparatus within and without the gap and part of the press-frame. Figs. 7 and 8 give details of the adjustable cam and its supports, which accomplish the second pinch.

In the figures, 10 is the impression-cylinder of a printing-press to which my gripper mechanism is attached. The gripper-shaft 12 carries within the gap the fingers 14 and outside the tumbler-cam 16 as usually constructed. This cam is actuated and the gripper-shaft oscillated to and fro by the pins or buttons 18 and 20, respectively, and its position, as well as the pressure it exerts upon the paper when closed, is further controlled and maintained by the compressed spring 22 in the well-known way; but this spring is made weak and but slightly compressed and dependence is not put upon it for the efficient holding of the paper. On the contrary, the gripper-fingers are made of thin elastic metal and when they strike the edge of the sheet presented to them from the feed-board 24 it is with a gentle impact that hinders a rebound as well as the sudden coercing of unevenness in the paper and its propulsion forward, which in a greater or less degree is common in all presses and known to be largely influenced by the strength of the blow effected by the spring 22. After the sheet has been seized in this manner the shaft 12 has imparted to it a further fractional rotation in the closing direction whereby the pressure exerted by the fingers upon the paper is considerably increased. This is accomplished by the auxiliary cam 26, which is adjustable

about the fulcrum at 28, on which the oscillating piece 30 swings. This cam is constructed to impinge against one side of the tumbling-cam at 32, which in this relation 5 plays the part of a lever on the shaft, and by moving it on its socket 34, where it may be held in any desired position by the set-screw 36, the amount of the additional rotation to which the gripper-shaft is subjected, and consequently the increase of pressure on the paper exerted by the gripper-fingers, is under perfect control provided the swing of the cam 36 be made sufficient and can be properly timed. This is all accomplished by the 15 pins 18 and 38 acting on the curved ends of the oscillating piece 30. This piece is further controlled and locked in its two positions by the compressed spring 40 from its attachment at 41 forcing said piece against its adjustable stops 42 and 44. When the 20 pin 18 has thrown the tumbling-cam 16 over and closed the gripper-fingers on the paper, it meets immediately afterward at 46 the inclined end of the oscillating piece 30 and 25 throws that piece over, whereby the cam 26 is brought into action and the second pinch maintained upon the paper till the inclined surface at 48 meets the fixed pin 38, the piece 30 thrown back, and the tumbling-cam immediately afterward opened by the pin 20, which operates the inner end of the tumbling-cam and releases the sheet for delivery.

From the foregoing it will be seen that the sheet of paper is taken by the grippers, constructed as described, in a very favorable 35 manner, for the fingers may be made thin and light and under the influence of a weak spring they will fall gently upon the leading edge of the sheet without the momentum and rebound which are common with heavy stiff 40 grippers or the oblique blow forward given with force enough to move the sheet. Then the supplemental angular movement of the gripper-shaft, which follows immediately, 45 though very small in amount, gives a very positive and sustained increase of pressure upon the paper, which is effected silently and without jar and may be apportioned in amount to the weight and resistance offered 50 by the stock to be handled.

It is evident that the devices I have described as best adapted for the objects in view may be changed in many ways—as, for instance, a lever independent of the tumbling-cam may be made fast to the shaft and operated directly by a cam upon the press-frame— 55 and I do not therefore confine myself to the specific devices I recommend so long as the principle upon which my invention is based 60 is maintained, and it will be found that any original gripper movement analogous to that shown and described, of which there are several, with modifications of more or less importance, will admit of combination with my

auxiliary cam or its equivalent, resulting in 65 the supplemental increase of pressure on the paper determined by its action in the manner set forth provided that the gripper-fingers descend upon the sheet from above.

What I claim is—

1. A gripper mechanism provided with a set of grippers and means to actuate the same to lightly clasp a paper sheet by the first or closing movement, and a second mechanism for increasing the pressure of the gripper-fingers on the paper sheet after the same has been seized and held, all combined substantially as described. 70 75

2. A gripper mechanism adapted to grasp and hold the edge of a sheet of paper fed thereto; in combination with a cam-actuated lever on the gripper-shaft adapted to continue to a definite extent the partial rotation of the shaft after the impact of the gripper-fingers, whereby the sheet is held with increase of 80 85 pressure; substantially as described.

3. In a gripper mechanism, a gripper-shaft carrying fingers adapted to fall upon and grasp the sheet; in combination with a spring to hold the fingers closed or open; with a cam upon the shaft to throw the fingers over in either direction; and with a second auxiliary cam arranged and timed to act in like directions after the first has closed and before it has opened the fingers, and adapted to give 90 95 a supplemental increase of pressure thereto when in contact with the sheet; substantially as described.

4. In a gripper mechanism, a gripper-shaft carrying fingers adapted to fall upon and clasp the sheet; in combination with a light spring to hold the fingers closed or open; with a tumbling-cam upon the gripper-shaft to throw the fingers over in either direction; with a supplemental cam within operative 100 105 range of a lever on the gripper-shaft and adapted to continue the rotation of said shaft through a predetermined angle after the tumbling-cam has closed the fingers; and with stationary buttons to actuate the cams at proper times whereby the elastic gripper-fingers hold the sheet with a pressure definitely increased; substantially as described.

5. In a gripper mechanism, a tumbling-cam in combination with a supplemental cam functionally placed in reference thereto, and adapted to continue definitely the angular motion thereof after the gripper-fingers have closed; with a spring to lock the supplemental cam in its extreme positions; and with stationary buttons to throw it in and out of operation at the proper times; substantially as described. 110 115 120

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