

No. 637,575.

Patented Nov. 21, 1899.

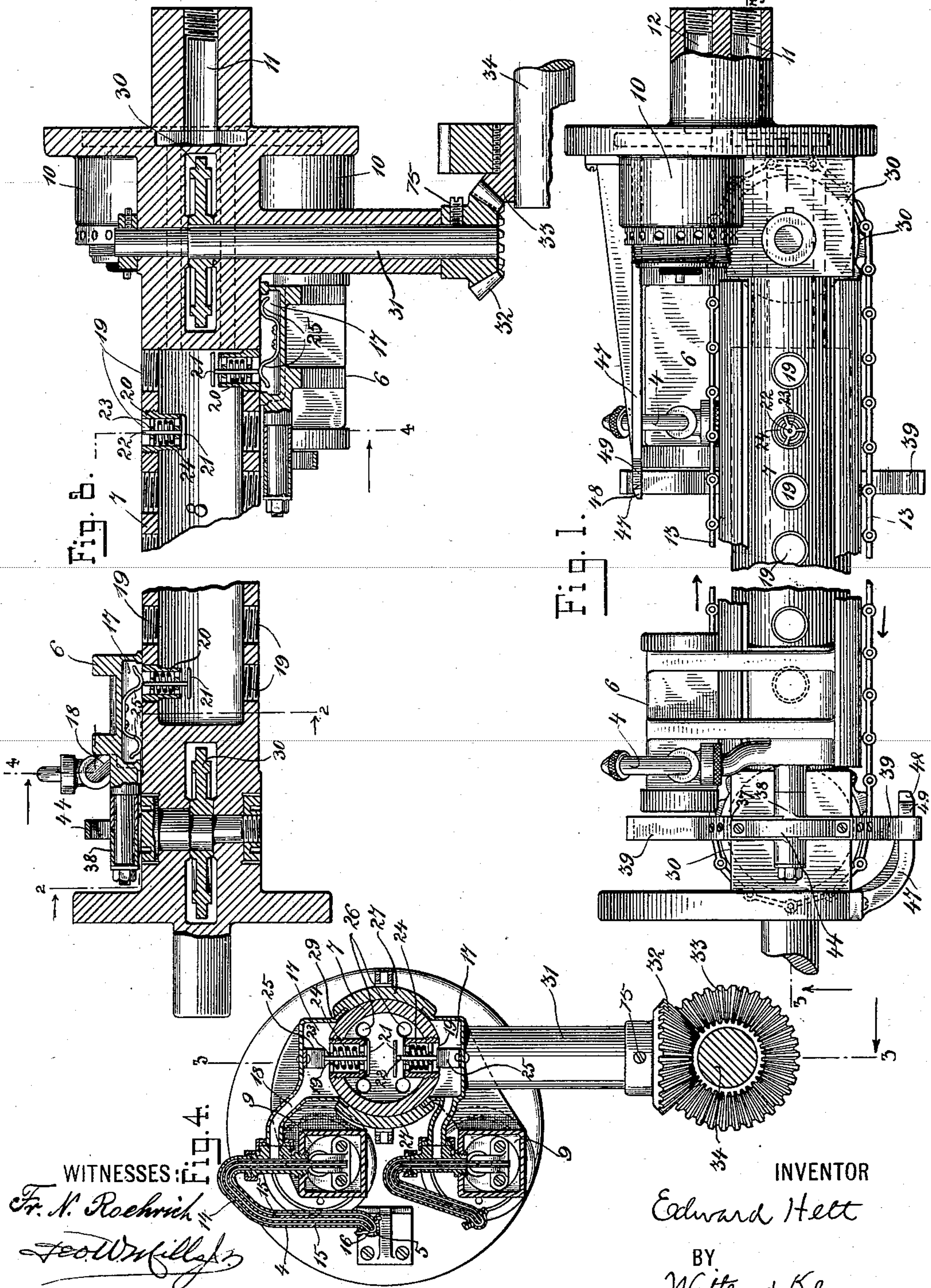
E. HETT.

DAMPING MECHANISM FOR LITHOGRAPHIC PRESSES.

(Application filed June 13, 1898.)

(No Model.)

5 Sheets—Sheet 1.



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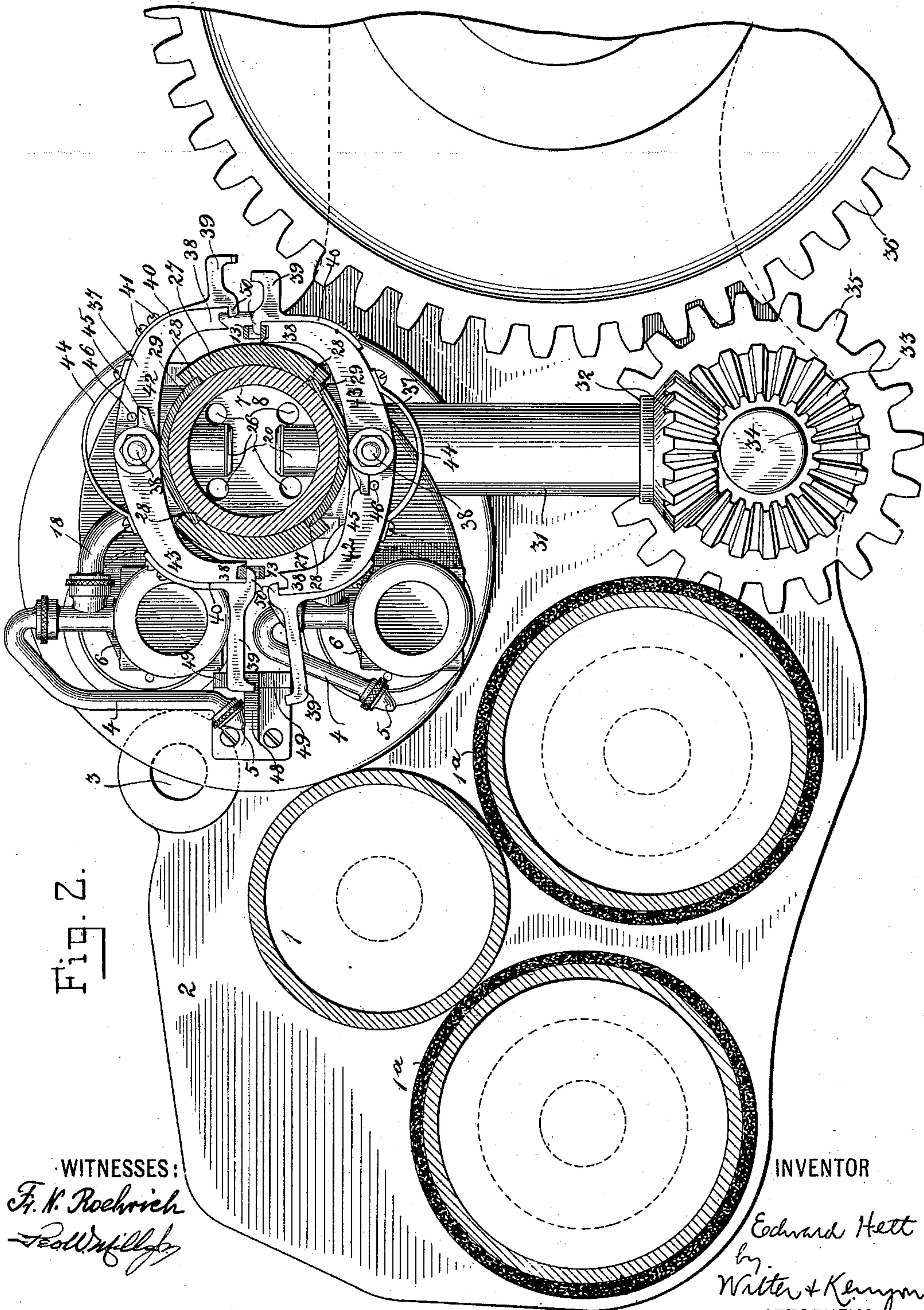


Fig. 2.

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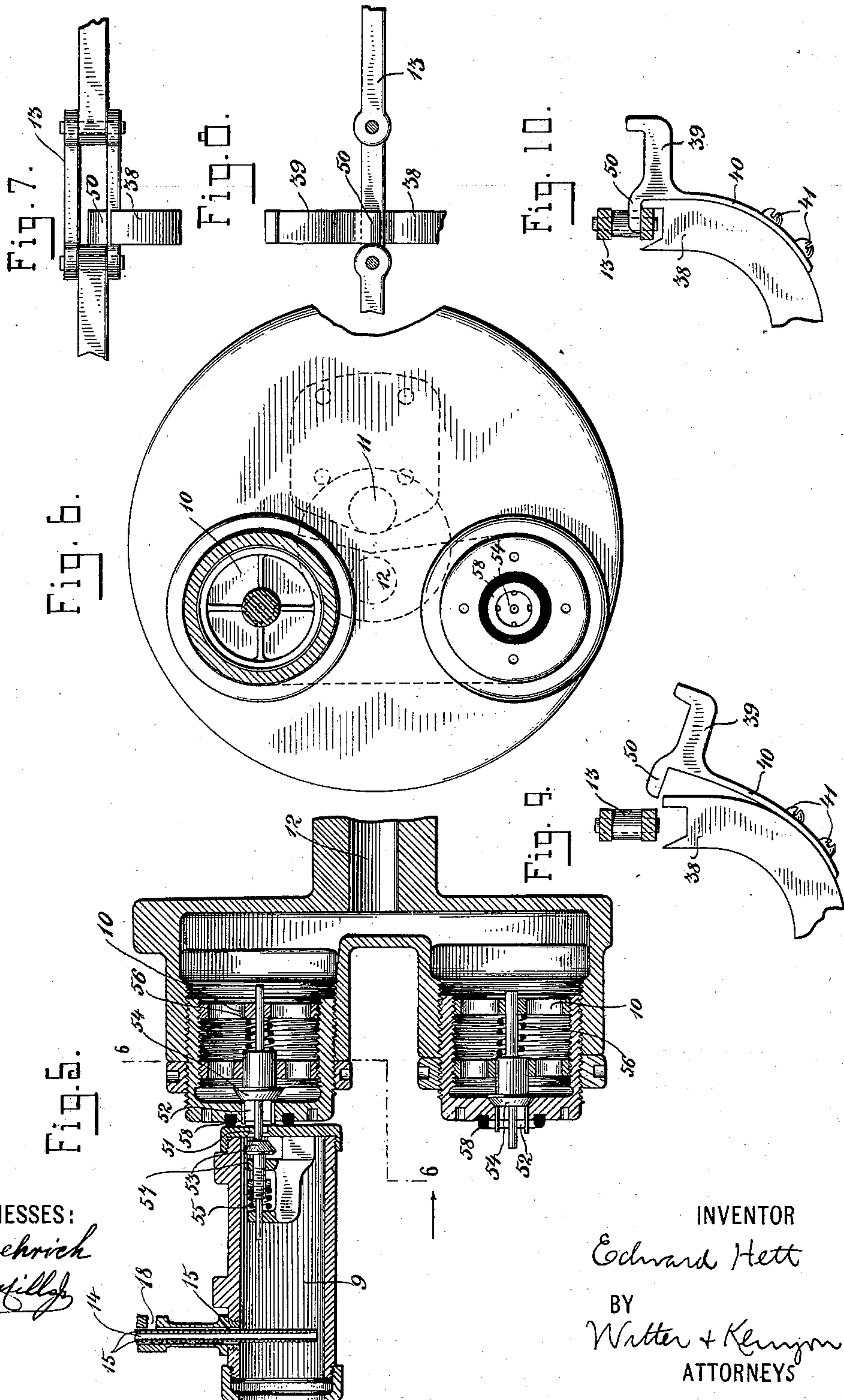
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(Application filed June 13, 1898.)

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5 Sheets—Sheet 3.



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5 Sheets—Sheet 4.

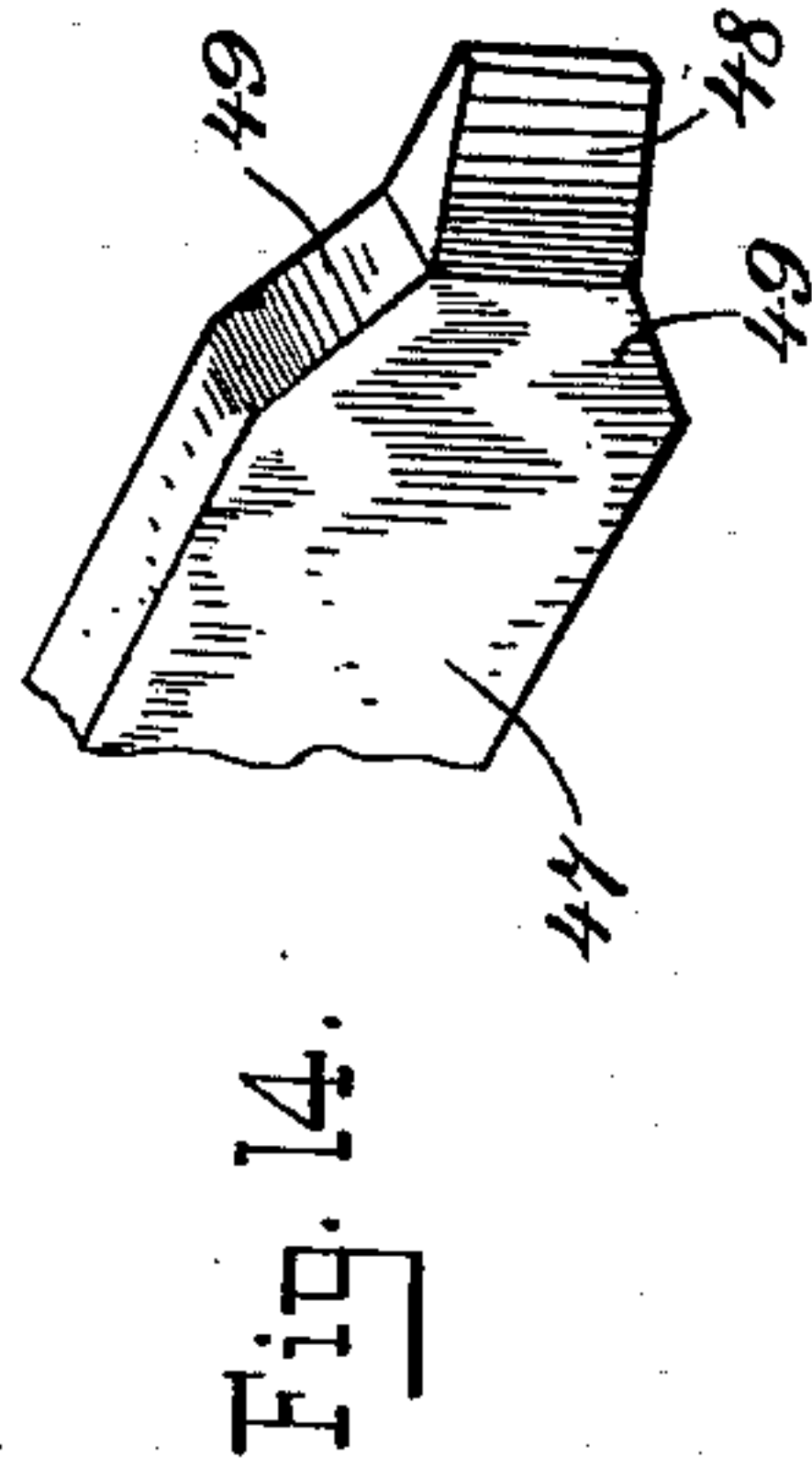
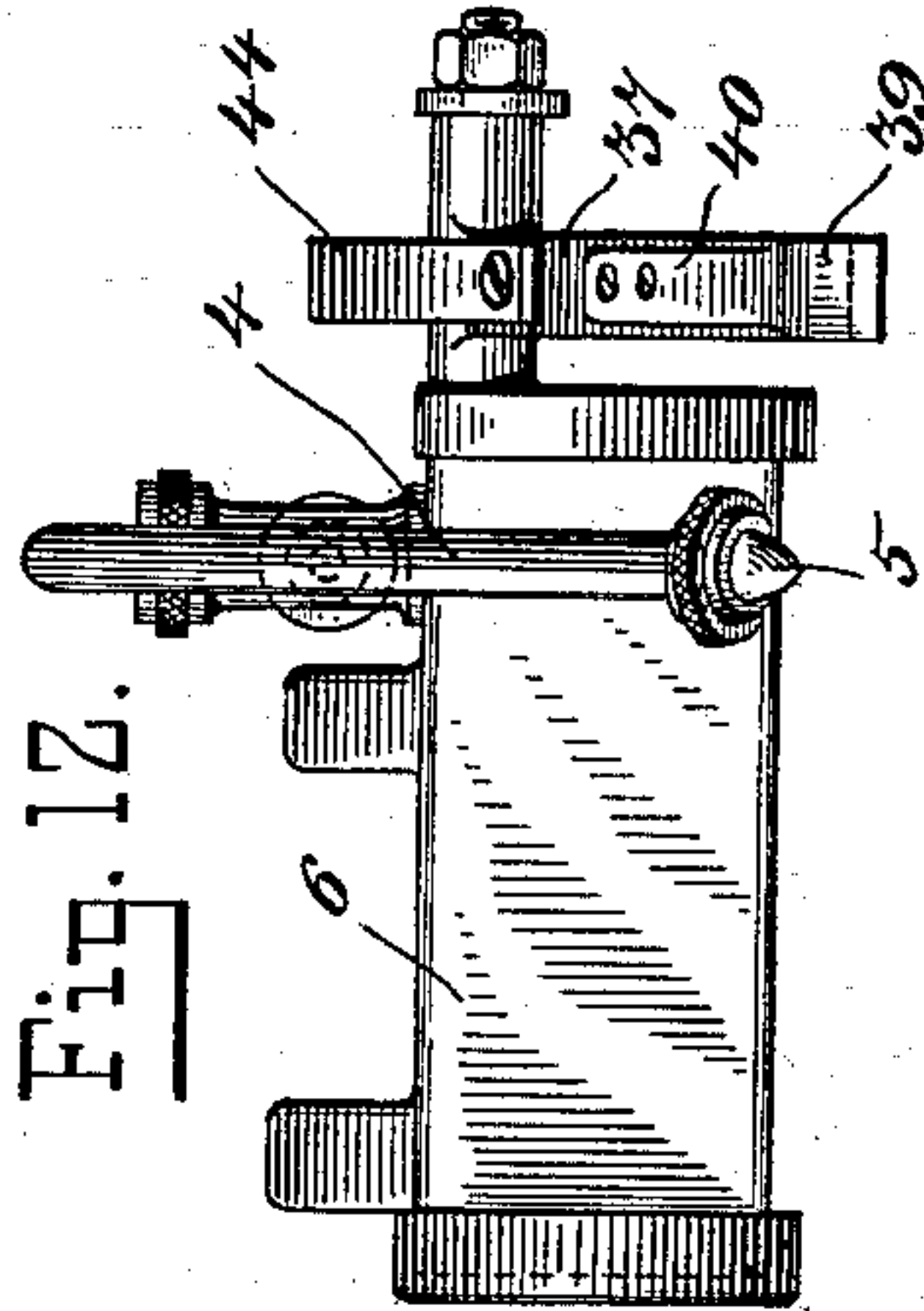
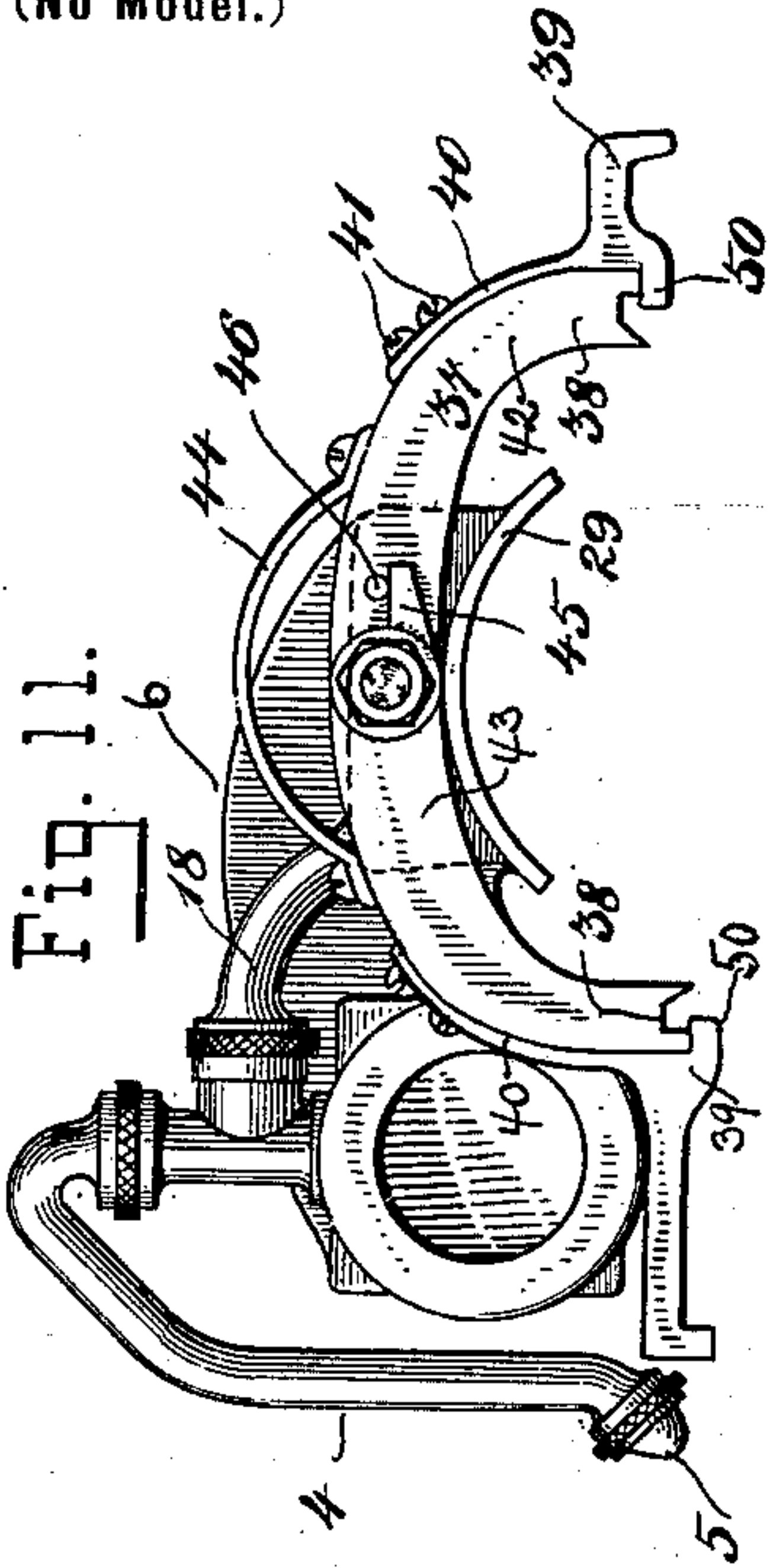
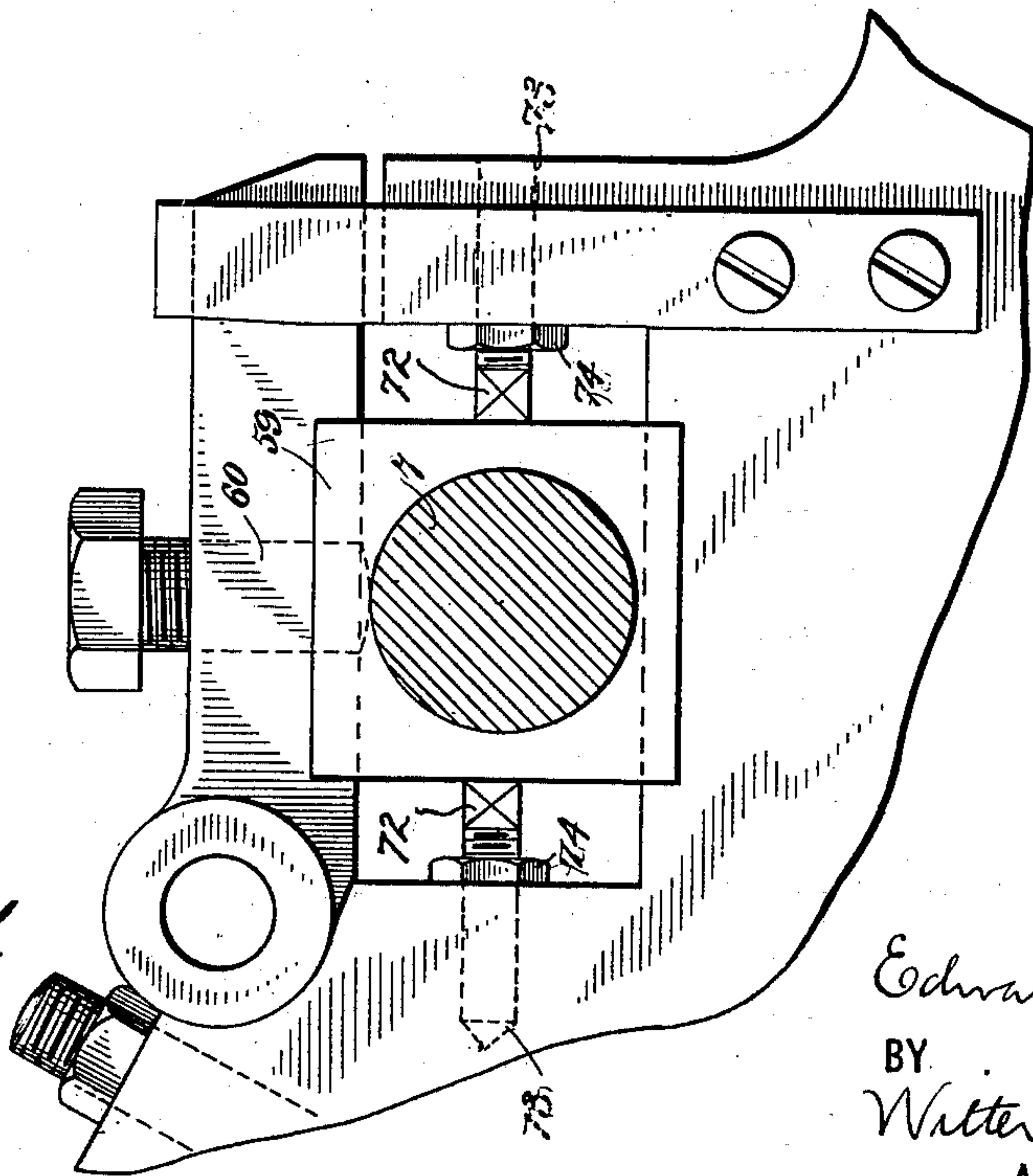


Fig. 13.



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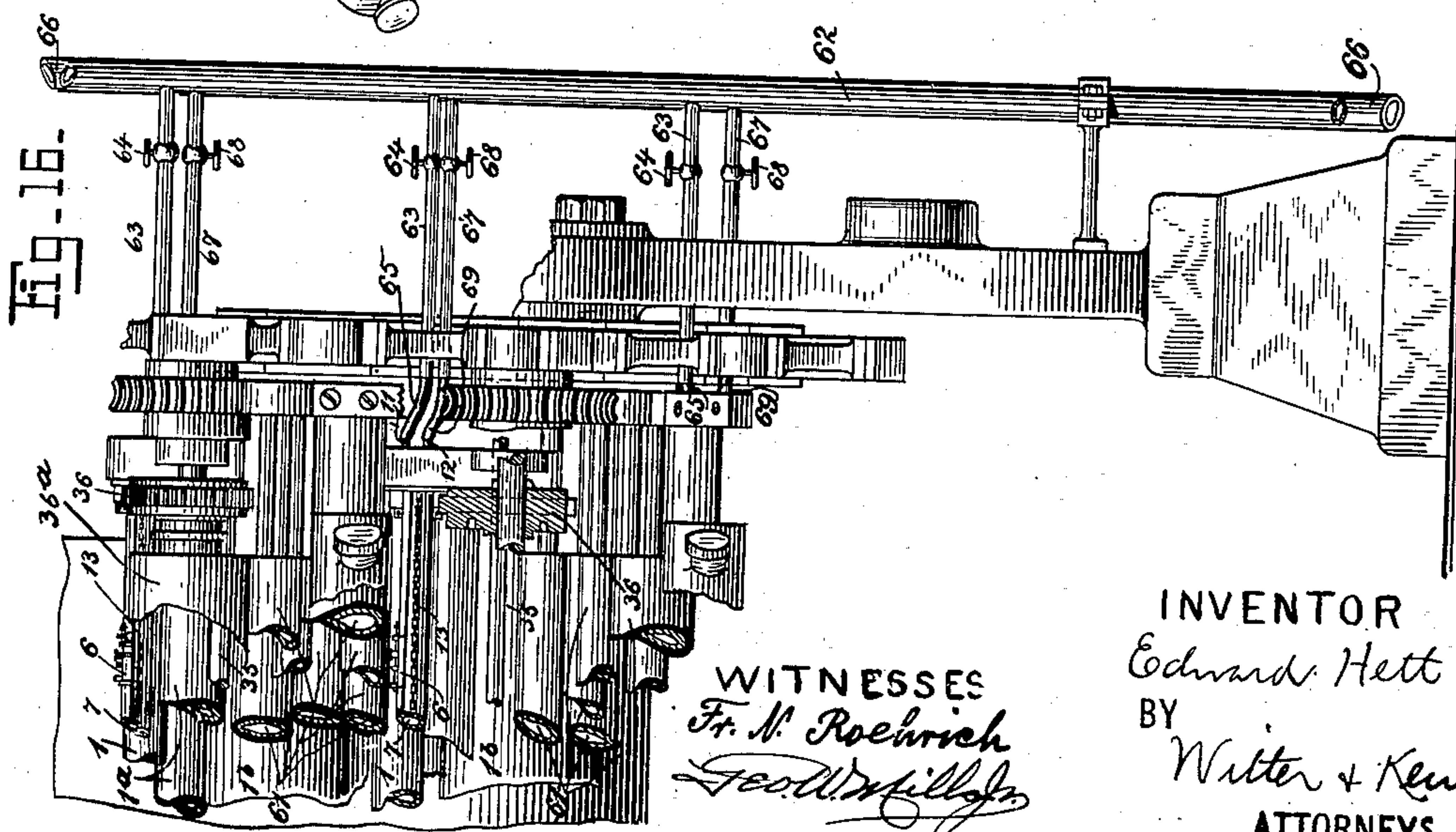
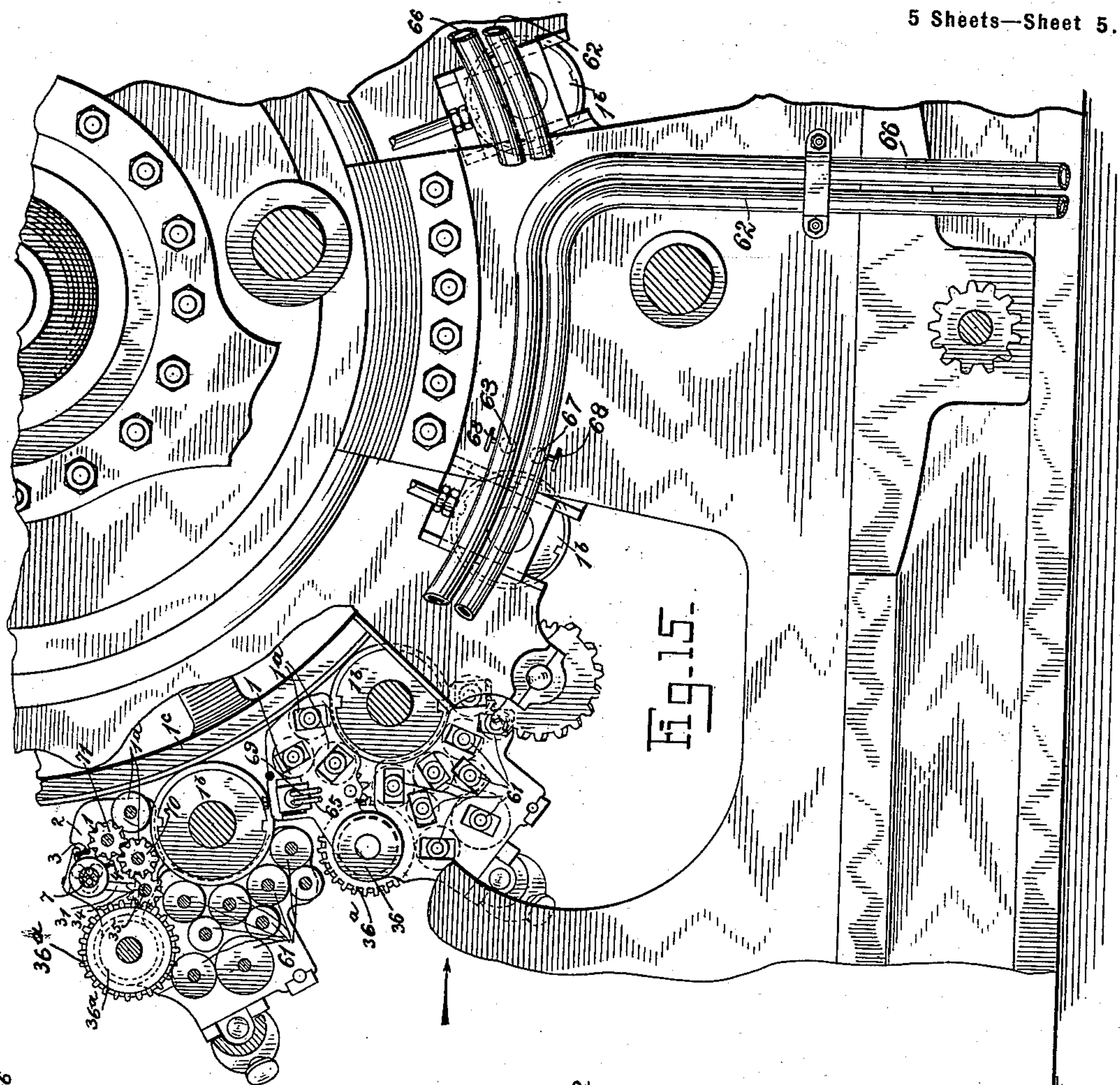
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DAMPING MECHANISM FOR LITHOGRAPHIC PRESSES.

(Application filed June 13, 1898.)

(No Model.)

5 Sheets—Sheet 5.



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DAMPING MECHANISM FOR LITHOGRAPHIC PRESSES.

SPECIFICATION forming part of Letters Patent No. 637,575, dated November 21, 1899.

Application filed June 13, 1898. Serial No. 683,353. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HETT, a citizen of the United States, and a resident of New York, (New Dorp,) in the county of Richmond, State of New York, have invented certain new and useful Improvements in Damping Mechanism for Lithographic Presses, of which the following is a specification.

My invention relates to lithographic or planographic presses, and particularly to the damping mechanism for use in such presses.

It has for its main object to provide improved means for supplying water in suitable quantities and at proper times and places to the damping-rollers of a lithographic or planographic press, and especially to prevent an excessive supply of water to such rollers and to the printing-cylinder.

It consists of the novel devices and combinations herein shown and described.

In the operation of lithographic presses great difficulty has heretofore been encountered in avoiding an excess of water upon the damping-rollers and upon the printing-surface, especially where the printing-surface is cylindrical, and particularly so in multicolor-presses where damping-rollers often lie directly above the paper web and where there are a plurality of sets of printing-cylinders, each relatively small as compared with the drum or impression cylinder and each with its set of inking-rollers and damping-rollers with their connections, and where, owing to the necessarily small size and crowded and complicated character of the mechanism and to its consequent inaccessibility when the press is in operation, it is of the utmost importance that the damping be automatic, exact, and certain in its operation without the need of constant supervision. This difficulty has been due in great measure to the lack of a positive feed to the damping rollers of water or other suitable dampening liquid and to improper or defective distribution of the water. It is of course essential in lithographic-printing presses that a sufficient supply of water be furnished to the damping-rollers and the printing-cylinder and that such water be evenly and properly distributed. An excess of water is, however, almost as injurious as a scarcity of water. Where the water is excessive in amount, it

tends to form into drops or layers upon the damping-rollers or printing-surface, to ruin the lithographic surface, to work back upon the inking-rollers and mix with the ink, to interfere with the proper inking of the printing-cylinder, to fall in drops upon the web, and generally to render the resulting product inferior or unmarketable. I have found that by the use of a fine spray or sprays of water or other suitable damping liquid thrown upon one or more of the damping-rollers and fed by any suitable means in connection with damping-rollers, one or more of which are driven positively by any suitable driving mechanism at a determinate rate of speed, water or other suitable damping liquid can be properly and positively supplied in sufficient amount and in even and proper distribution for securing the best results without any deleterious excess of water, without the formation of drops or layers, and without any injury whatever to the lithographic-printing surfaces or to the proper inking thereof or to the printed work itself. I have also found that all of these beneficent results can be obtained by using one or more atomizers in which compressed air from a suitable source of supply is caused to blow across or around the mouth of a tube leading from any suitable water-supply and from which atomizer or atomizers spray is thus thrown upon the damping-rollers. I have also found that these results are obtained to the best advantage when one or more atomizers, properly connected with sources of supply of compressed air and water, are caused to travel reciprocatingly back and forth along the length of the damping-rollers.

This case is designated by me as "Case A" to distinguish it from two other cases executed simultaneously herewith, designated by me as "Cases B and C," respectively.

In the drawings accompanying this specification and forming part hereof, in which like reference characters in the different figures refer to corresponding parts, I have shown and will now proceed to describe the preferred form of my improved devices.

Figure 1 is a plan of my improved damping devices. Fig. 2 is a transverse vertical section on lines 2 2 of Fig. 3, looking in the direction of the arrow and extending also through

the damping-rollers. Fig. 3 is a vertical longitudinal section of the damping devices, taken on the line 3 3 of Figs. 1 and 4 in the direction indicated by the arrows. Fig. 4 is a transverse vertical section through the same, taken on the lines 4 4 of Fig. 3, viewed as indicated by the arrows. Fig. 5 is a longitudinal vertical section through the water-supply passages, the water-reservoirs, and the water-chamber. Fig. 6 is a transverse vertical section through the same on line 6 6 of Fig. 5. Figs. 7, 8, 9, and 10 are detailed views of parts of the jaws of the reciprocating carriage and the chain. Fig. 11 is a detailed end view of one of the reciprocating carriages. Fig. 12 is a side view of the same. Fig. 13 shows means for adjusting the air-cylinder. Fig. 14 is a perspective view of one of the cams for operating the jaws of the reciprocating carriage. Fig. 15 is a side view, partly in section, of part of a multicolor-press with the casing removed, showing a number of printing-cylinders with their sets of inking-rollers and damping-rollers and connections and the means for supplying compressed air and water to the different sets of atomizers, the air and water supply pipes being broken, as shown, to enable other parts to be seen more clearly, and the sets of damping-rollers and inking-rollers for one of the cylinders having their bearing-boxes removed to show the parts behind. Fig. 16 is a front view of the parts shown in Fig. 15.

1 and 1^a represent damping-rollers of a lithographic press. These may be of any desired kind or number and arranged in any desired manner. As shown in the drawings, 1 is an ordinary brass roller and constitutes the distributing-roller, and 1^a 1^a are the cloth-covered rollers, which usually come in direct contact with the printing-cylinder.

1^b is the drum of a multicolor-press, of which 1^b 1^b are printing-cylinders. (See Fig. 15.)

As shown, the damping-rollers are mounted upon frames 2, of which one only is shown in the drawings pivoted upon the shaft of the ink-distributing cylinder 36^a and operated by any suitable mechanism, so as to be capable of being swung back and forth so as to be capable of moving the damping-rollers out of or into printing position.

4 4 are atomizers having orifices 5 5 for throwing fine spray upon one or more of the damping-rollers, as shown in Fig. 2. The atomizers 4 4 are each mounted on a reciprocating carriage 6 6. The reciprocating carriages are secured in guides of an air-cylinder 7 and are adapted to have a reciprocating longitudinal motion along the air-cylinder, and thus to have a reciprocating longitudinal motion in the direction of the axes of the damping-rollers. Compressed air is constantly supplied from a compressed-air reservoir 8 in the air-cylinder 7 to the atomizers in a manner presently to be described. Each carriage 6 carries a water-chamber 9 for sup-

plying water to the atomizer in a manner presently to be described. The store of water in the water-chamber is renewed each time the carriage reaches the end of its travel toward the right, as shown in Figs. 3 and 5, from a water-reservoir 10. The air-passage 11 supplies compressed air to the air-reservoir 8 from an air-pump or other suitable source. Water is supplied to the water-reservoir 10 through the pipe 12.

Reciprocating longitudinal motion along the air-cylinder 7 is given to the reciprocating carriages 6 6 by means of an endless chain 13. This chain is driven, in a manner presently to be described, constantly in the same direction and forms a horizontal loop around the air-cylinder. Each reciprocating carriage is provided with two sets of jaws, one set adapted to grip the chain upon one side of the air-cylinder and the other set to grip the chain upon the other side, and so arranged that one set only is in operation at one time. One set of either carriage grips the chain upon one side, thus causing the carriage to be pulled to the opposite end of the air-cylinder, whereupon that set of jaws release their grip upon the chain upon that side and the other set of jaws grip the chain upon the other side of the air-cylinder, causing the reciprocating carriage to be carried again to the opposite end of the air-cylinder, where the second set of jaws release their grip upon the chain and the first set again take hold. Thus a constant reciprocating motion is given to each reciprocating carriage and to the atomizer carried by it. As shown, the reciprocating carriages are arranged so that when either one is at one end of the air-cylinder the other carriage will be at the opposite end. The motion of one of the carriages is therefore always in a direction reverse to that of the motion of the other. The details of this mechanism will be described farther on.

Each atomizer is composed of a central tube 14, through which the water passes and which extends at one end into water-chamber 9 to a point near the bottom of the chamber, as shown in Figs. 4 and 5, and of a surrounding air-tube 15. The central water-tube 14 has an opening 16 at its end opposite the orifice 5 of the atomizer. Air-tube 15 is connected by air-passage 18 with an air-chamber 17 in the reciprocating carriage. Air-tube 15 also extends down and opens into the upper part of water-chamber 9. Compressed air from air-chamber 17 passes through air-passage 18 into air-tube 15, exerts a pressure upon the water in water-chamber 9 tending to aid in forcing water up through water-tube 14, and in blowing around and across the opening 16 in the water-tube and out through orifice 5 draws water from water-tube 14 and drives it in the form of fine spray upon the damping-rollers. The compressed air in air-tube 15 thus not only comminutes the water into fine spray, but also exerts a pushing as well as a pulling

pressure upon the water in the water-tube, causing a more positive feed to be given to the atomizers.

Compressed air is supplied to air-chamber 17 by the following-described means: Air-reservoir 8 is provided on each side with a series of screw-threaded openings 19. Each series of these openings is so arranged that as a reciprocating carriage passes forward or backward along the air-cylinder the air-chamber 17 will register with each of the openings 19 in turn. In each of these openings is screwed a short cylinder 20, forming a valve-seat for a valve 21. Each valve is composed of a circular head, forming the valve proper, and a stem 22, working in bearings 23 in the valve-seat cylinders 20. A spring 24 tends to keep the valves closed against the valve-seat.

25 are two spring-buttons secured in air-chamber 17 of the reciprocating carriage and are so arranged that as the reciprocating carriage travels along the air-cylinder the spring-buttons 25 will successively strike against and depress the stems 22 of the valves 21, thus successively opening the valves and permitting compressed air to flow from the air-reservoir into the air-chamber. If desired, these spring-buttons may be so arranged that while one is passing over the intervening spaces between the openings into the air-reservoir the other will be in contact with the stem of one of the valves, in this way insuring a continuous opening between the air-reservoir and the air-chamber, so that a constant pressure of air will always be operative upon the atomizer, while the press is in operation.

In the form of device shown in the drawings I have shown two reciprocating carriages 66, one on the upper side and one on the under side of the air-cylinder. Accordingly one of the series of openings into the air-reservoir is arranged along the upper surface of the air-cylinder and the other along the lower surface of the air-cylinder. Air is supplied to the reservoir 8 through air-pipe 11 and air-passages 26. The supply of such air can be regulated in any well-known manner.

In order to secure the reciprocating carriages to the air-cylinder and to permit of their free longitudinal motion thereon, curved plates 27 are bolted or otherwise secured to the air-cylinder upon each side, as shown in Fig. 2, and along the upper and lower edges of each plate a portion of the same is cut away toward the air-cylinder to form guideways 28, into which project flanges or edges of a curved plate 29, secured to each reciprocating carriage, as clearly shown in Fig. 2.

The mechanism for imparting to the reciprocating carriages their reciprocating longitudinal movements consists of the following-described devices: Chain 13 is continuously driven in the direction of the arrows shown in Fig. 1 by means of sprocket-wheels 30 30. One of the latter is mounted upon shaft 31. This shaft has at one end a beveled gear-wheel 32, meshing with beveled gear-wheel

33 on shaft 34. Shaft 34 also carries a spur-wheel 35, meshing with a spur-wheel 36, mounted upon or secured to the ink-distributing cylinder 36^a. By the above-described gearing, actuated by the driving mechanism of the press, continuous motion is imparted to endless chain 13, as above described. Each reciprocating carriage has secured to it a yoke 37. This yoke is loosely mounted upon a short shaft 38 on each carriage immediately over or under the air-cylinder, so as to be capable of a slight oscillating movement. Each yoke is provided at each end with a set of jaws, one jaw of each set being the end 38^a of the yoke and the other jaw being a spring-jaw 39, secured by a spring-arm 40 to the yoke, as by bolts 41. The yoke 37 is composed of two parts 42 and 43, slightly independent of each other in movement. A spring 44, secured to each of the two parts 42 and 43, tends to keep them apart, while a spur 45 on the part 43 and a pin 46 on part 42, adapted to strike against each other, as in Fig. 2, tend to prevent the action of the spring from pressing them any farther apart, as shown in Fig. 2. When one side of the yoke is lifted, it tends to press the spring 44 to the other side. The elastic connection between the two parts, by means of the spring 44, enables one side to move slightly under ordinary pressure, while the other side is rigidly held, thus preventing fracture of the parts in case both parts of the yoke should be acted upon by the cams or by any obstruction at the same time. The jaws 38 and 39 are adapted when opened and when brought into proper position opposite a link of the chain 13 to seize the upper or lower portion of the link and to thus securely grip the chain for the purpose of enabling the chain to pull the reciprocating carriage from one end of the air-cylinder to the other. The jaws are brought into the proper position for thus gripping the chain by means of the cams 47. One of these cams is shown in detail in Fig. 14. It has two operative cam-faces, one, 48, which is a vertical face inclined outwardly from the air-cylinder, and two faces 49, inclined upward and downward, respectively, at an angle. As the reciprocating carriage approaches one end of the air-cylinder the spring-jaw 39 of the set of jaws gripping the chain comes into contact with face 48 of cam 47, throwing the spring outward and drawing tooth 50 of the jaw 39 out of the link of the chain into the position shown in Fig. 9, thus releasing the grip of the jaws upon the chain at that point. When the jaw strikes the inclined upward face 49 of the cam, it tilts the yoke 37 upward, throwing the opposite part of the yoke downward and causing the spring-jaw 39 of its set of jaws to strike against a link of the chain on the opposite side of the loop formed by the chain 13, forcing the spring-jaw outward until it passes over the outer part of the link, whereupon the tooth 50 of the jaw slips into the link, seizing the

chain, as shown in Fig. 10. The carriage is now gripped to the opposite side of the loop formed by the chain 13 and is thereupon hauled in the opposite direction to the starting-point at the other end of the air-cylinder. There the grip of the jaws upon the chain is released by a similar cam 47, and the set of jaws first in operation take hold of the chain upon the opposite side of the loop. In this way a constant reciprocating motion of the carriage from one end of the air-cylinder to the other is secured. Fig. 7 is a side view of a set of jaws gripping a link of a chain. Fig. 8 is a top view of the same. Fig. 10 is a vertical cross-section of the same.

The store of water in water-chamber 9 is replenished by the following-described means: 10 10 are two water-reservoirs, one above the other, as shown in Fig. 5, at one end of the air-cylinder. They are connected by passages to water-pipe 12. The upper one of these reservoirs registers with the water-chamber 9 of the upper reciprocating carriage and the lower one with water-chamber 9 of the lower reciprocating carriage when those carriages are at the extreme right-hand point of their travel, as shown in Figs. 1 and 5. When the water-chamber of one of the reciprocating carriages is in this position, an opening 51, leading to the water-chamber, and an opening 52, leading from the water-reservoir 10, register with each other. Opening 51 is closed by valve 53, and opening 52 is closed by valve 54. These valves are held in a closed position against the openings or valve-seats by springs 55 and 56, respectively, which act upon the stems of the valves. A stop 57 limits the opening movement of the valve 53. The outer part of the stem of valve 54 projects through opening 52 slightly outside of the case of reservoir 10, as shown in Fig. 5. As the reciprocating carriage approaches reservoir 10 the outward end of the stem of valve 54 strikes against valve 53 of water-chamber 9, forcing it backward, as spring 56 is made stronger than spring 55, until valve 53 strikes against stop 57, whereupon valve 54 is forced from its seat, thus affording a direct and open passage-way from reservoir 10 to water-chamber 9, permitting the water to flow from the former into the latter, thus replenishing the stock in the water-chamber. This replenishing operation is repeated at every complete travel of the reciprocating carriage. A rubber ring 58 in the face of the casing of reservoir 10 prevents the escape of water.

In Fig. 13 I have shown means for adjusting air-cylinder 7 so as to permit of its rotation upon its axis to any desired position. The cylindrical ends of the shaft of air-cylinder 7 are seated in cylindrical openings in bearings 59 in the frame of the machine and can be rotated in said bearings as desired. When rotated to the desired position, they are secured by a set-screw 60, as shown. In order to prevent this rotation of the shaft of cylinder 7 from throwing gear 32 out of mesh

with gear 33, I make bearing-box 59 adjustable sidewise and also make gear 32 adjustable along shaft 31. Bearing-box 59 can be moved sidewise a slight distance and can be secured in any position by means of screws 72, mounted in screw-threaded openings 73 in the frame. Nuts 74 are for the purpose of locking screw 72 in any position. I make gear 32 adjustable slightly along shaft 31 by providing the gear with a screw-threaded opening, in which a screw 75 is placed. By unscrewing this screw gear 32 can be slightly moved lengthwise of shaft 31 and by tightening the screw can be securely held in position on the shaft. The rotation of the shaft of cylinder 7 is of course a very slight one, and by means of the adjustment of bearing-box 59 and gear 32, as above described, gears 32 and 33 can always be kept in mesh with each other.

In Figs. 15 and 16 I have shown my improved devices as applied to a multicolor-press where a large drum 1^c has a series of relatively small printing-cylinders 1^b 1^b surrounding it, each with its set of inking-rollers 61 and other inking mechanism and its set of damping-rollers 11^a. With so many and such fine and complicated parts crowded closely together in a comparatively small space it is impossible to show the mechanism in detail or even to show all of it in these views. They are intended merely to show the general arrangement of my improved devices in a multicolor lithographic press and to show the means for supplying compressed air and water or other suitable damping liquid to the different sets of atomizers and the means for positively driving the distributing damping-rollers 11. 62 is an air-supply pipe for supplying compressed air to the different air-reservoirs 8. It is connected with an air-pump (not shown) or any other suitable source of supply of compressed air. Branch air-pipes 63, each provided with a cock 64, lead from air-supply pipe 62 and are provided at their ends with flexible hose connections 65, leading to air-pipe 11. The flexible hose permit the swinging action of the damping-frames 2 without interrupting the flow of air. By these means compressed air can be readily supplied in sufficient quantities to all the air-reservoirs without interfering with the operation of the press. 66 is a water-supply pipe for supplying water or other suitable damping liquid to the various water-reservoirs. It is similarly provided with branch-pipes 67, having cocks 68 and flexible hose 69 connecting with the various water-pipes 12. 66 is connected with a pump (not shown) or any other suitable source of supply of water or other suitable damping liquid. By the above means the various water-reservoirs are readily and constantly supplied with damping liquid. Each distributing damping-roller 1 is positively driven by the driving mechanism of the press in the following manner: 36^a is the ink-distributing roller. It is driven by the driving mechanism of the press in any

suitable manner. Spur-teeth upon ink-distributing roller 36^a, through spur-wheel 35, drive spur-wheel 70, loosely mounted upon the shaft of one of the damping-rollers 1^a, and the latter drives spur-wheel 71, rigidly secured to the shaft of distributing damping-roller 1, thus driving the latter positively at any determinate rate of speed desired. Roller 1 drives rollers 1^a 1^a by friction in the usual way. By driving the damping-rollers positively at a determinate rate of speed I have found that the amount of water best suited for lithographic work can be obtained with greater accuracy and certainty than when the rollers are driven by friction in the usual manner.

By means of my improved spraying device in connection with damping-rollers driven positively by suitable driving mechanism at a determinate rate of speed I am enabled to supply to the damping-rollers with greater certainty and exactness an amount of damping liquid suited to produce the best results in lithographic printing and to avoid both a scarcity and also an excess of such liquid, and I am thus enabled to prevent the injurious results referred to above that flow from either such an excess or a scarcity. These beneficial results are obtained in a high degree of excellence where my spraying device is a traveling one, as in such a construction of the parts both the spraying device and damping-roller are constantly moving and the stream of fine spray falls upon any one spot of the surface of the damping-roller but for the briefest moment of time, thus preventing the formation of drops or layers or the deposit upon the damping-rollers of any excessive amount of damping liquid, while furnishing at the same time by a positive feed a sufficient amount of liquid properly distributed to answer all the requirements of good lithographic printing. By the use of the atomizer, the preferred form of my spraying device, the stream of spray is finely comminuted and well distributed and can be readily and accurately regulated.

As my improved devices are automatic and are accurate, reliable, and certain in operation and need little supervision, they are of especial value in multicolor-presses, where the parts of the mechanism are numerous and complicated in character and small in size, where the printing is rapidly performed, and where printing is taking place simultaneously in many different places, so that constant supervision and regulation of the action of the damping mechanism, so necessary in the mechanism now employed in lithographic presses, cannot be maintained.

The term "lithographic" as used in the specification and claims herein is employed in its broad sense of planographic to include any printing by the lithographic process or any printing-surface adapted for printing lithographically, whether such printing be done by or such printing-surface be stone,

metal, or any other surface capable of printing by the lithographic process as distinguished from printing from an intaglio or raised surface or whether such lithographic-printing surface be flat, curved, or cylindrical.

Many modifications may be made in the above-described apparatus without departing from my invention. Thus the spraying device employed need not travel. It need not be an atomizer, but may be any suitable means for spraying liquid. Changes may be made in the form, number, and arrangement of the spraying devices employed, or where a traveling spraying device is used in the extent of its travel and the means for imparting reciprocating motion to it, or where an atomizer is used in the means for supplying compressed air and water to the atomizer. Many modifications might be made other than those above recited. In supplying the water to the atomizer I prefer to have the water under pressure (although this is not essential to the operation of my improved devices) inasmuch as a more positive feed is obtained where the water is kept under pressure.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a damping-roller of a lithographic press, two traveling spraying devices each adapted to have a reciprocating longitudinal motion in the direction of the axis of the damping-roller but always in a direction reverse to that of the other spraying device and each adapted to throw spray for damping the roller, means for imparting such reciprocating longitudinal motion to the spraying devices, means for feeding the spraying devices with suitable damping liquid.

2. The combination with a damping-roller of a lithographic press, of a traveling spraying device, adapted to have a reciprocating longitudinal motion in the direction of the axis of the damping-roller and adapted to throw spray for damping the roller, an opening connecting with the water-tube of the spraying device adapted to register at some part of the travel of the spraying device with an opening from a source of liquid-supply, valves for said openings adapted, when the said openings register with each other, to open to permit water or other suitable damping liquid to flow into the water-tube of the spraying device for feeding the spraying device with such liquid.

3. The combination with a damping-roller of a lithographic press, of two traveling atomizers, each adapted to have a reciprocating longitudinal motion in the direction of the axis of the damping-roller but in a direction reverse to that of the other atomizer and each adapted to throw spray for damping said roller, means for imparting such reverse longitudinal motion to the atomizers and means for supplying damping liquid and compressed air to the atomizers.

4. The combination with a damping-roller

of a lithographic press, of a traveling atomizer, adapted to have a reciprocating longitudinal motion in the direction of the axis of the damping-roller and to throw spray for
 5 damping said roller, an endless chain and means for driving it, two sets of jaws connected with the atomizer, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip
 10 the chain on the other side of the loop, means for causing the jaws to grip and to release the chain, whereby a reciprocating, longitudinal motion will be imparted to the atomizer and means for supplying damping liquid and com-
 15 pressed air to the atomizer.

5. The combination with a damping-roller of a lithographic press, of a traveling atomizer, adapted to have a reciprocating longitudinal motion in the direction of the axis of
 20 the damping-roller and to throw spray for damping said roller, an endless chain and means for driving it, two sets of jaws connected with the atomizer, one set adapted to grip the chain on one side of the loop formed
 25 by the chain and the other set adapted to grip the chain on the other side of the loop, and the said jaws being so connected with each other that when one releases the chain the other will grip it on the other side of the loop,
 30 and means for causing the jaws to release the chain, whereby a reciprocating, longitudinal motion will be imparted to the atomizer and means for supplying damping liquid and compressed air to the atomizer.

35 6. The combination with a damping-roller of a lithographic press, of a traveling atomizer, adapted to have a reciprocating longitudinal motion in the direction of the axis of the damping-roller and to throw spray for
 40 damping said roller, an endless chain and means for driving it, two sets of jaws connected with the atomizer, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip
 45 the chain on the other side of the loop, cams to release the chain from one set of said jaws and to cause the other set to grip the chain on the other side of the loop, whereby a reciprocating, longitudinal motion will be im-
 50 parted to the atomizer and means for supplying damping liquid and compressed air to the atomizer.

7. The combination with a damping-roller of a lithographic press, of a traveling atomizer, adapted to have a reciprocating longitudinal motion in the direction of the axis of
 55 the damping-roller and to throw spray for damping said roller, an endless chain and means for driving it, a tilting yoke secured to the atomizer having a set of jaws at each of its ends, one set adapted to grip the chain
 60 on one side of the loop formed by the chain and the other set adapted to grip the chain on the other side of the said loop, cams to release the chain from one set of said jaws and
 65 to cause the other set to grip the chain on the other side of the loop, whereby a reciprocating,

longitudinal motion will be imparted to the atomizer, and means for supplying damp-
 ing liquid and compressed air to the atomizer. 70

8. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer
 75 is borne, an endless chain and means for driving it, a tilting yoke secured to the reciprocating carriage having a set of jaws at each of its ends, one set adapted to grip the chain on one side of the loop formed by the chain
 80 and the other set adapted to grip the chain on the other side of the said loop, cams to release the chain from one set of said jaws and to cause the other set to grip the chain on the other side of the loop, whereby a reciprocating
 85 longitudinal motion in the direction of the axes of the damping-rollers will be imparted to the reciprocating carriage and the atomizer, and means for supplying damping liquid and compressed air to the atomizer.

9. The combination with a damping-roller 90 of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, an endless chain and means for driving it, a tilting yoke secured to the reciprocating carriage having a set of jaws at each
 95 of its ends, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip the chain on the other side of the said loop, springs for closing said jaws to grip the chain, cams to force one set of jaws open to release the chain
 100 and to tilt the yoke so as to cause the other set of jaws to seize the chain on the other side of the loop, whereby a reciprocating longitudinal motion in the direction of the axes of the damping-roller will be imparted to the reciprocating carriage and the atomizer, and means for supplying damping liquid and compressed air to the atomizer. 110

10. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer
 115 is borne, an endless chain and means for driving it, a tilting yoke secured to the reciprocating carriage composed of two parts movable relatively upon each other, each part having a set of jaws at its end, one set adapted to grip the chain on one side of the loop formed
 120 by the chain and the other set adapted to grip the chain on the other side of the said loop, springs for closing said jaws to grip the chain, cams to force one set of jaws open to release the chain and to tilt the yoke so as to cause
 125 the other set of jaws to seize the chain on the other side of the loop, whereby a reciprocating longitudinal motion in the direction of the axes of the damping-roller will be imparted to the reciprocating carriage and the atomizer, and a spring for pressing the two
 130 parts of the yoke away from each other, a projecting arm of one part adapted to strike a stop on the other to limit such movement, all

so arranged that the yoke will remain sufficiently rigid to cause the cams and the sets of jaws to release and seize the chain but will yield to prevent fracture of the apparatus when any obstruction is encountered, and means for supplying damping liquid and compressed air to the atomizer.

11. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, an endless chain forming a loop, means for driving it, a tilting yoke secured to each reciprocating carriage having a set of jaws at each of its ends, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip the chain on the other side of the said loop, cams to release the chain from one set of said jaws and to cause the other set to grip the chain on the other side of the loop, whereby a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of the travel of the other carriage and atomizer will be imparted to each carriage and atomizer, and means for supplying damping liquid and compressed air to each atomizer.

12. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, an endless chain forming a loop, means for driving it, a tilting yoke secured to each reciprocating carriage having a set of jaws at each of its ends, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip the chain on the other side of the said loop, cams to release the chain from one set of said jaws and to cause the other set to grip the chain on the other side of the loop, whereby a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of the travel of the other carriage and atomizer will be imparted to each carriage and atomizer, and means for supplying damping liquid and compressed air to each atomizer.

13. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, an endless chain forming a loop, means for driving it, a tilting yoke secured to each reciprocating carriage having a set of jaws at each of its ends, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip the chain on the other side of the said loop, springs for closing said jaws to grip the chain, cams to force one set of jaws open to release the chain and to tilt the yoke so as to cause the other set of jaws to seize the chain on the other side of the loop, whereby a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of the travel of the other carriage and atomizer will be imparted to each carriage and atomizer, and means for supplying damping liquid and compressed air to each atomizer.

ing longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of the travel of the other carriage and atomizer will be imparted to each carriage and atomizer, and means for supplying damping liquid and compressed air to each atomizer.

14. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, an endless chain forming a loop, means for driving it, a tilting yoke secured to each reciprocating carriage composed of two parts movable relatively upon each other, each part having a set of jaws at its end, one set adapted to grip the chain on one side of the loop formed by the chain and the other set adapted to grip the chain on the other side of the said loop, springs for closing said jaws to grip the chain, cams to force one set of jaws open to release the chain and to tilt the yoke so as to cause the other set of jaws to seize the chain on the other side of the loop, whereby a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of the travel of the other carriage and atomizer will be imparted to each carriage and atomizer, a spring for pressing the two parts of the yoke away from each other, a projecting arm of one part adapted to strike a stop on the other to limit such movement, all so arranged that the yoke will remain sufficiently rigid to cause the cams and sets of jaws to release and seize the chain but will yield to prevent fracture of the apparatus when any obstruction is encountered, and means for supplying damping liquid and compressed air to each atomizer.

15. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings in the air-cylinder adapted to open as the said opening in the carriage registers with the said openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizer, and means for supplying damping liquid to the atomizer.

16. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, an air-cylinder, containing a reservoir of com-

pressed air, along which the reciprocating carriage is adapted to travel, means for supplying compressed air to the reservoir, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings in the air-cylinder adapted to open as the said opening in the carriage registers with the said openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizer, and means for supplying damping liquid to the atomizer.

17. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne; means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings, springs for closing the valves, a spring-button upon the carriage adapted to engage with the valves to open them as the opening in the carriage registers with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriage, and means for supplying damping liquid to the atomizer.

18. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, an air-chamber in the carriage communicating with the air-passages of the atomizer, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the air-chamber of the carriage, valves for said openings in the air-cylinder adapted to open as the said opening in the carriage registers with the said openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizer, and means for supplying damping liquid to the atomizer.

19. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, a water-chamber and an air-chamber in the carriage communicating with the atomizer, means for supplying the said water-chamber with water or other damping liquid, an air-cylinder, containing a reservoir of compressed

air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings in the air-cylinder adapted to open as the said opening in the carriage registers with the said openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizer.

20. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, a water-chamber and an air-chamber in the carriage communicating with the atomizer, means for supplying the said water-chamber with damping liquid, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings, springs for closing the valves, a spring-button upon the carriage adapted to engage with the valves to open them as the opening in the carriage registers with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriage.

21. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, and means for supplying damping liquid and compressed air to the atomizers.

22. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings in the air-cylinder adapted to open as the said openings in the carriages register with the openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizers, and means for supplying damping liquid to the atomizers.

23. The combination with a damping-roller

of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings, springs for closing the valves, spring-buttons upon the carriages adapted to engage with the valves to open them as the openings in the carriages register with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriages, and means for supplying damping liquid to the atomizers.

24. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, a water-chamber and an air-chamber in each carriage communicating with the atomizer borne by said carriage, means for supplying each water-chamber with damping liquid, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings in the air-cylinder adapted to open as the said openings in the carriages register with the openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizers.

25. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, a water-chamber and an air-chamber in each carriage, communicating with the atomizer borne by said carriage, means for supplying each water-chamber with damping liquid, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said

openings, springs for closing the valves, valves for said openings in the air-cylinder adapted to open as the said openings in the carriages register with the openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizers.

26. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to the atomizer having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to the atomizer in the direction of the axis of the damping-roller, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings in the air-cylinder adapted to open as the said opening in the carriage registers with the said openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizer, and means for supplying damping liquid to the atomizer.

27. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to the atomizer having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to the atomizer in the direction of the axis of the damping-roller, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings, springs for closing the valves, a spring-button upon the carriage adapted to engage with the valves to open them as the opening in the carriage registers with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the

air-cylinder to the air-passages of the reciprocating carriage, and means for supplying damping liquid to the atomizer.

28. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to the atomizer having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to the atomizer in the direction of the axis of the damping-roller, an air-chamber in the carriage communicating with the air-passages of the atomizer, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the air-chamber of the carriage, valves for said openings in the air-cylinder adapted to open as the said opening in the carriage registers with the said openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizer, and means for supplying damping liquid to the atomizer.

29. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to the atomizer having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to the atomizer in the direction of the axis of the damping-roller, a water-chamber and an air-chamber in the carriage communicating with the atomizer, means for supplying the said water-chamber with damping liquid, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings, springs for closing the valves, a spring-button upon the carriage adapted to engage with the valves to open them as the opening in the carriage registers with the openings in the air-cylinder to permit compressed air to flow from the res-

ervoir of the air-cylinder to the air-passages of the reciprocating carriage.

30. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to each reciprocating carriage, each yoke having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws of each yoke, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to each reciprocating carriage and atomizer in the direction of the axis of the damping-roller and whereby the motion of each reciprocating carriage will always be in the reverse direction to that of the other carriage, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings in the air-cylinder adapted to open as the said openings in the carriage register with the openings in the air-cylinder, to permit compressed air to flow from the reservoir of the air-cylinder to the atomizers, and means for supplying damping liquid to the atomizers.

31. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer on which it is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to each reciprocating carriage, each yoke having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws of each yoke, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to each reciprocating carriage and atomizer in the direction of the axis of the damping-roller and whereby the motion of each reciprocating carriage will always be in the reverse direction to that of the other carriage, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings, springs for closing the valves, spring-buttons upon the carriages adapted to engage with the

valves to open them as the openings in the carriages register with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriages, and means for supplying damping liquid to the atomizers.

32. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, an endless chain forming a loop, means for driving said chain, a tilting yoke secured to each reciprocating carriage, each yoke having two sets of spring-jaws, one set at each end of the yoke, one set adapted to seize the chain on one side of the loop and the other set adapted to seize it on the other side of the loop, a cam on each side of the loop for releasing the grip of one set of jaws of each yoke, tilting the yoke and causing the other set of jaws to seize the chain upon the other side whereby a constant reciprocating longitudinal motion will be imparted to each reciprocating carriage and atomizer in the direction of the axis of the damping-roller and whereby the motion of each reciprocating carriage will always be in the reverse direction to that of the other carriage, a water-chamber and an air-chamber in each carriage, communicating with the atomizer borne by said carriage, means for supplying each water-chamber with damping liquid, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings, springs for closing the valves, spring-buttons upon the carriages adapted to engage with the valves to open them as the openings in the carriages register with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriages.

33. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, an opening connecting with the water-tube of the atomizer adapted to register at some part of the travel of the carriage with an opening from a source of supply of damping liquid, valves for said openings adapted, when the said openings register with each other, to open to permit damping liquid to flow into the water-tube of the atomizer and means for supplying compressed air to the atomizer.

34. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a

reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, a water-chamber in the reciprocating carriage connecting with the water-tube of the atomizer, a water-reservoir connected with a source of supply of damping liquid, openings in the said water-chamber and the water-reservoir adapted to register with each other at some part of the travel of the carriage, valves for said openings adapted, when the said openings register with each other, to open to permit the liquid to flow into the water-tube of the atomizer, and means for supplying compressed air to the atomizer.

35. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, a water-chamber in the reciprocating carriage connecting with the water-tube of the atomizer, a water-reservoir connected with a source of supply of damping liquid, openings in the said water-chamber and the water-reservoir adapted to register with each other at some part of the travel of the carriage, valves for said openings, springs for keeping the valves closed, means for compressing the springs and opening the valves, when the openings register with each other, to permit the damping liquid to flow into the water-tube of the atomizer, and means for supplying compressed air to the atomizer.

36. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, a water-chamber in the reciprocating carriage connecting with the water-tube of the atomizer, a water-reservoir connected with a source of supply of damping liquid, openings in the said water-chamber and the water-reservoir adapted to register with each other at some part of the travel of the carriage, a valve for the opening into the water-chamber, a spring for closing said valve, a stop for limiting its opening movement, a valve for the opening out of the water-reservoir having a stem projecting outward through the opening, a spring for closing said valve, stronger than the spring of the water-chamber valve, whereby the reciprocating carriage in its travel will cause the outwardly-projecting stem of the water-reservoir valve to strike and open the water-chamber valve and when that valve strikes against its stop, to open the water-reservoir valve, whereby damping liquid will flow from the water-reservoir to the water-chamber, and an encircling ring for preventing the escape of liquid.

37. The combination with a damping-roller of a lithographic press, of an atomizer adapted to throw spray for damping said roller, a reciprocating carriage upon which the atomizer is borne, means for imparting to the carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriage is adapted to travel, openings in the air-cylinder registering with an opening into the carriage connecting with the air-passages of the atomizer, valves for said openings, springs for closing the valves, a spring-button upon the carriage adapted to engage with the valves to open them as the opening in the carriage registers with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriage, a water-chamber in the reciprocating carriage connecting with the water-tube of the atomizer, a water-reservoir connected with a source of supply of damping liquid, openings in the said water-chamber and the water-reservoir adapted to register with each other at some part of the travel of the carriage, valves for said openings, springs for keeping the valves closed, means for compressing the springs and opening the valves, when the openings register with each other, to permit liquid to flow into the water-tube of the atomizer, and means for supplying compressed air to the atomizer.

38. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, means of supplying compressed air to the atomizers, a water-chamber in each reciprocating carriage connecting with the water-tube of an atomizer, water-reservoirs, one to register with the water-chamber of each reciprocating carriage, each reservoir being connected with a source of supply of damping liquid, openings in the said water-chamber of each carriage and its corresponding water-reservoir adapted to register with each other at some part of the travel of the carriage, valves for said openings, springs for keeping the valves closed, means for compressing the springs and opening the valves, when the openings register with each other, to permit liquid to flow into the water-tube of each atomizer.

39. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that

of the travel of the other carriage, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings, springs for closing the valves, spring-buttons upon the carriages adapted to engage with the valves to open them as the openings in the carriages register with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriages, a water-chamber in each reciprocating carriage connecting with the water-tube of an atomizer, water-reservoirs, one to register with the water-chamber of each reciprocating carriage, each reservoir being connected with a source of supply of damping liquid, openings in the said water-chamber of each carriage and its corresponding water-reservoir adapted to register with each other at some part of the travel of the carriage, valves for said openings, springs for keeping the valves closed, means for compressing the springs and opening the valves, when the openings register with each other, to permit liquid to flow into the water-tube of each atomizer.

40. The combination with a damping-roller of a lithographic press, of two atomizers adapted to throw spray for damping said roller, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-roller and in a direction the reverse of that of the travel of the other carriage, a water-chamber and an air-chamber in each carriage communicating with the atomizer borne by said carriage, an air-cylinder, containing a reservoir of compressed air, along which the reciprocating carriages are adapted to travel, openings in the air-cylinder registering with openings into the carriages connecting with the air-passages of the atomizers, valves for said openings, springs for closing the valves, spring-buttons upon the carriages adapted to engage with the valves to open them as the openings in the carriages register with the openings in the air-cylinder to permit compressed air to flow from the reservoir of the air-cylinder to the air-passages of the reciprocating carriages, a water-chamber in each reciprocating carriage connecting with the water-tube of an atomizer, water-reservoirs, one to register with the water-chamber of each reciprocating carriage, each reservoir being connected with a source of supply of damping liquid, openings in the said water-chamber of each carriage and its corresponding water-reservoir adapted to register with each other at some part of the travel of the carriage, valves for said openings, springs for keeping the valves closed, means for compressing the springs and opening the valves,

when the openings register with each other, to permit liquid to flow into the water-tube of each atomizer.

41. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, two traveling atomizers for each damping mechanism, each adapted to have a reciprocating longitudinal motion in the direction of the axes of the damping-rollers but in a direction reverse to that of the other atomizer and each adapted to throw spray for damping said rollers, means for imparting such reverse longitudinal motion to the atomizers and means for supplying suitable damping liquid and compressed air to the atomizers.

42. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, atomizers adapted to throw spray for dampening the damping-rollers, reciprocating carriages upon which the atomizers are borne, means for imparting to such carriages a reciprocating longitudinal motion in the direction of the axes of the damping-rollers, a water-chamber and an air-chamber in each carriage communicating with the atomizer borne upon said carriage, and means for supplying suitable damping liquid and compressed air to such chamber.

43. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, two atomizers for each damping mechanism, adapted to throw spray for dampening the damping-rollers, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axis of the damping-rollers and in a direction the reverse of that of the travel of the other carriage of the same damping mechanism, and means for supplying suitable damping liquid and compressed air to the atomizers.

44. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by suitable driving mechanism for positively driving the distributing-roller at a determinate rate of speed, two traveling spraying devices for each damping mechanism, each spraying device adapted to have a reciprocating longitudinal motion in the direction of the axes of the damping-rollers but always in a direction the reverse of that of the other spraying device and each adapted to throw spray for dampening the damping-rollers, means for imparting reciprocating longitudinal motion to the spraying devices

and means for supplying the spraying devices with suitable damping liquid.

45. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by suitable driving mechanism for positively driving the distributing-roller at a determinate rate of speed, two traveling atomizers for each damping mechanism, each atomizer adapted to have a reciprocating longitudinal motion in the direction of the axes of the damping-rollers but in a direction reverse to that of the other atomizers and each adapted to throw spray for damping said rollers, means for imparting such reverse longitudinal motion to the atomizers and means for supplying a suitable damping liquid and compressed air to the atomizers.

46. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by suitable driving mechanism for positively driving the distributing-roller at a determinate rate of speed, atomizers adapted to throw spray for dampening the damping-rollers, reciprocating carriages upon which the atomizers are borne, means for imparting to the carriages a reciprocating longitudinal motion in the direction of the axes of the damping-rollers, a water-chamber and an air-chamber in each carriage communicating with the atomizer borne by said carriage and means for supplying suitable damping liquid and compressed air to such chambers.

47. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by suitable driving mechanism for positively driving the distributing-roller at a determinate rate of speed, two atomizers for each damping mechanism, adapted to throw spray for dampening the damping-rollers, a reciprocating carriage for each atomizer on which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axes of the damping-rollers and in a direction the reverse of that of the other carriage, and means for supplying suitable damping liquid and compressed air to the atomizers.

48. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by the driving mechanism of the press for positively driving the distributing-roller at a determinate rate of speed, two traveling spraying devices for each damping mechanism, each spraying device adapted to have a

reciprocating longitudinal motion in the direction of the axes of the damping-rollers but always in a direction reverse to that of the other spraying device and each adapted to throw spray for damping said rollers, means for imparting such reciprocating longitudinal motion to the spraying devices and means for supplying said spraying devices with suitable damping liquid.

49. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by the driving mechanism of the press for positively driving the distributing-roller at a determinate rate of speed, two traveling atomizers, each adapted to have a reciprocating longitudinal motion in the direction of the axes of the damping-rollers but in a direction reverse to that of the other atomizer and each adapted to throw spray for dampening said damping-rollers, means for imparting such reverse longitudinal motion to the atomizers, and means for supplying suitable damping liquid and compressed air to the atomizers.

50. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by the driving mechanism of the press for positively driving the distributing-roller at a determinate rate of speed, atomizers adapted to throw spray for dampening the

damping-rollers, reciprocating carriages upon which the atomizers are borne, means for imparting to such carriages a reciprocating longitudinal motion in the direction of the axes of the damping-rollers, a water-chamber and an air-chamber in each carriage communicating with the atomizer borne by such carriage, and means for supplying suitable damping liquid and compressed air to said atomizers.

51. In a multicolor lithographic press, the combination of an impression-drum, a series of printing-cylinders and inking mechanisms therefor, a series of damping mechanisms which include a distributing-roller, means actuated by the driving mechanism of the press for positively driving the distributing-roller at a determinate rate of speed, two atomizers for each damping mechanism for dampening the damping-rollers, a reciprocating carriage for each atomizer upon which it is borne, means for imparting to each carriage a reciprocating longitudinal motion in the direction of the axes of the damping-rollers and in a direction the reverse of that of the other carriage, and means for supplying suitable damping liquid and compressed air to the atomizers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD HETT.

Witnesses:

GEO. W. MILLS, Jr.,
EDWIN SEGER.