No. 637,578. Patented Nov. 21, 1899.

E. HETT.

METHOD OF AND MECHANISM FOR DAMPENING PLANOGRAPHIC PRESSES.

(Application filed Jan. 5, 1899.)

(No Model.) 6 Sheets—Sheet 1.

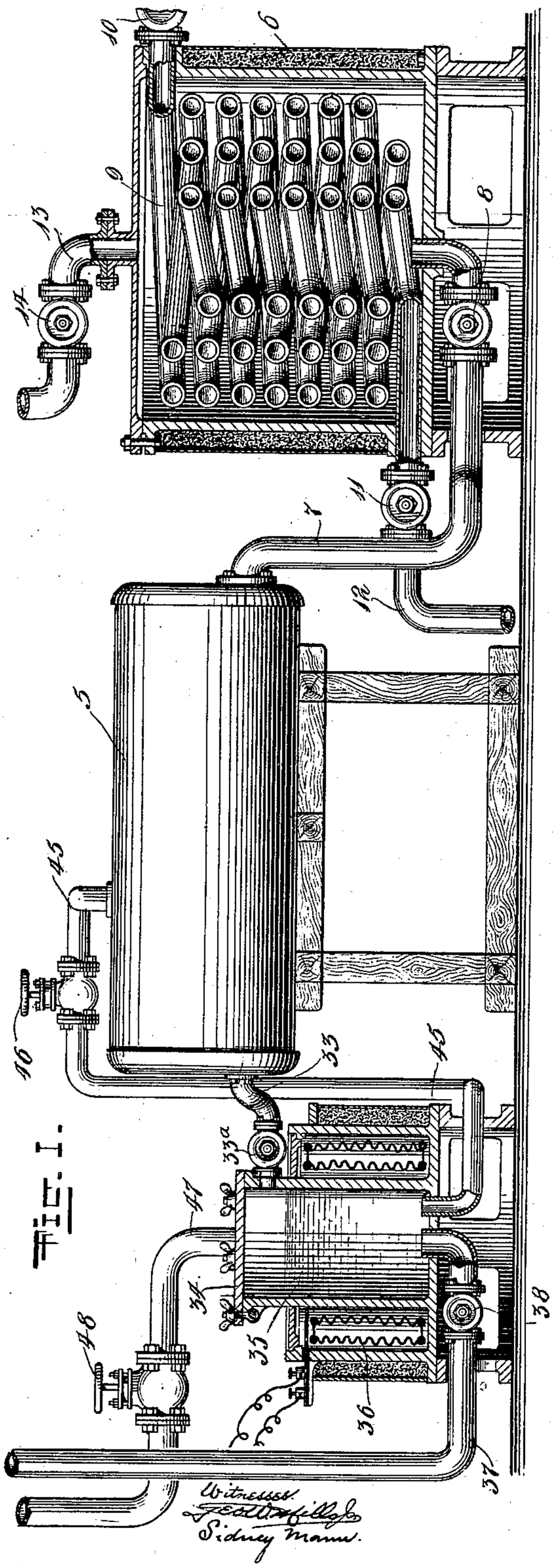

FIG. 1.

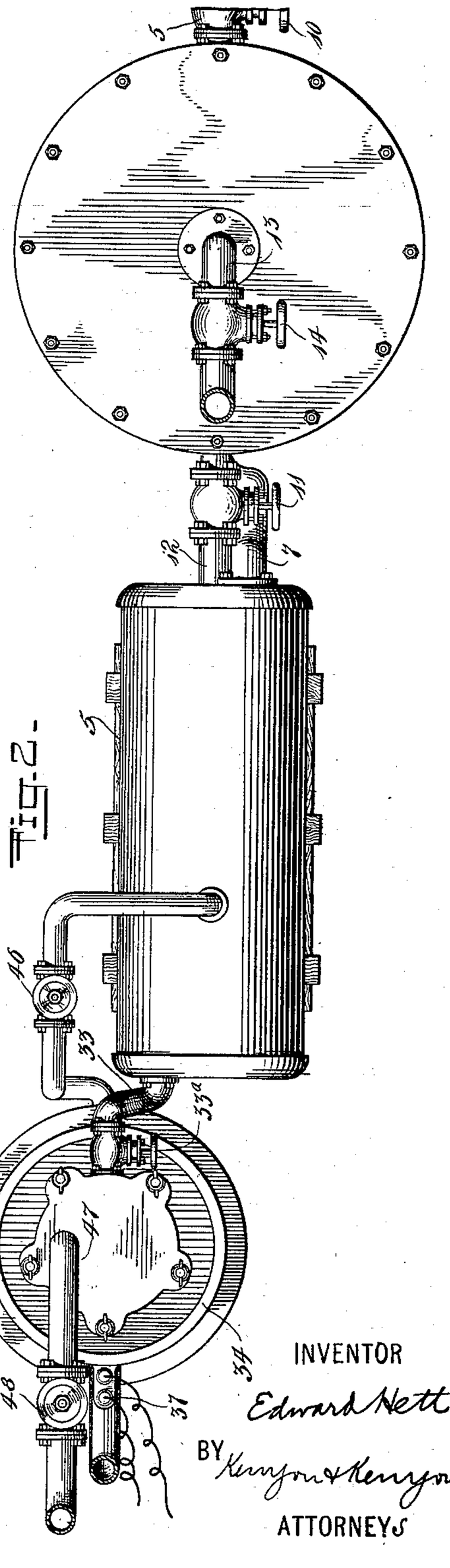

FIG. 2.

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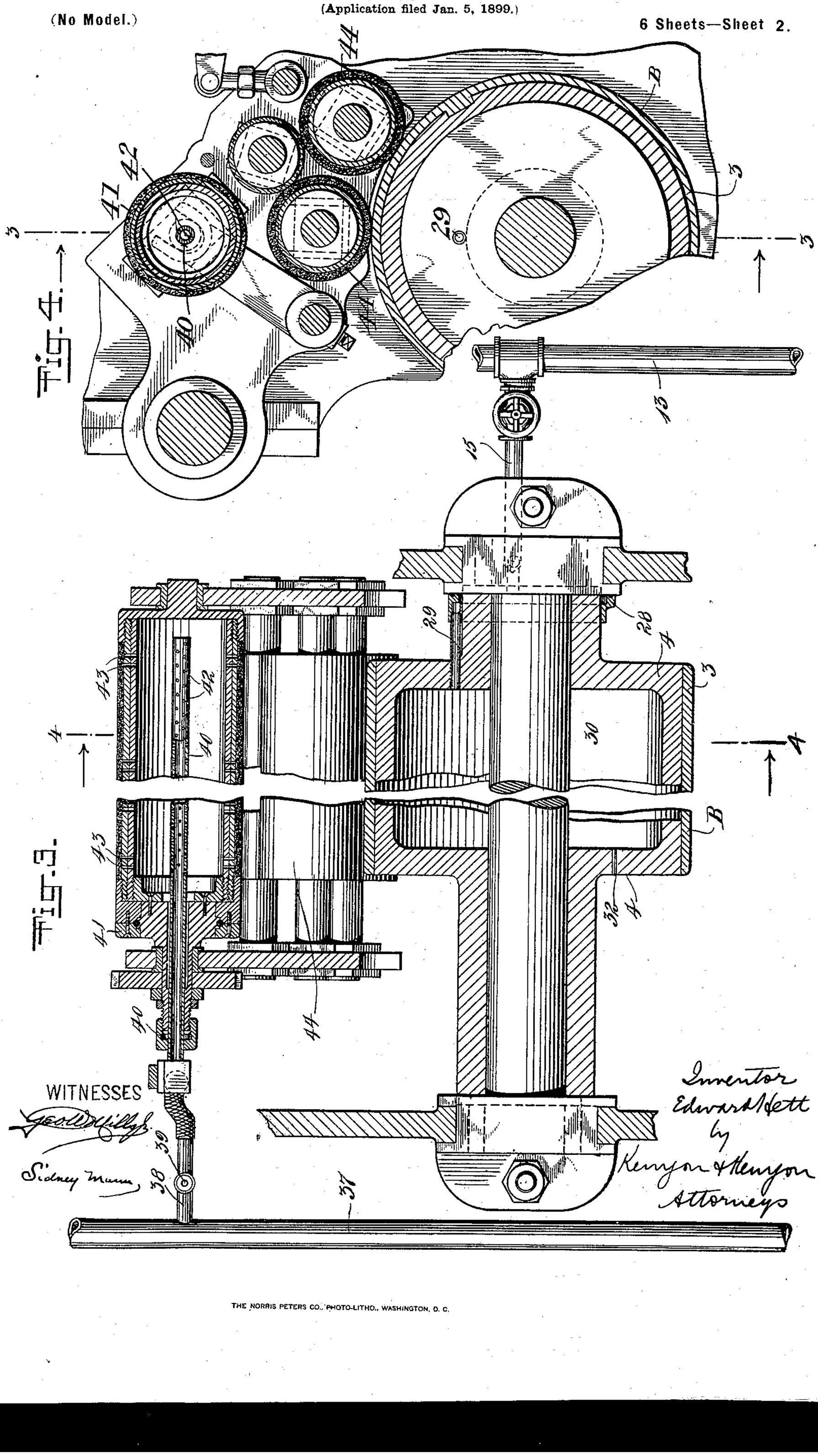
(No Model.) 6 Sheets—Sheet 2.



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METHOD OF AND MECHANISM FOR DAMPENING PLANOGRAPHIC PRESSES.

(No Model.) (Application filed Jan. 5, 1899.) 6 Sheets—Sheet 3.

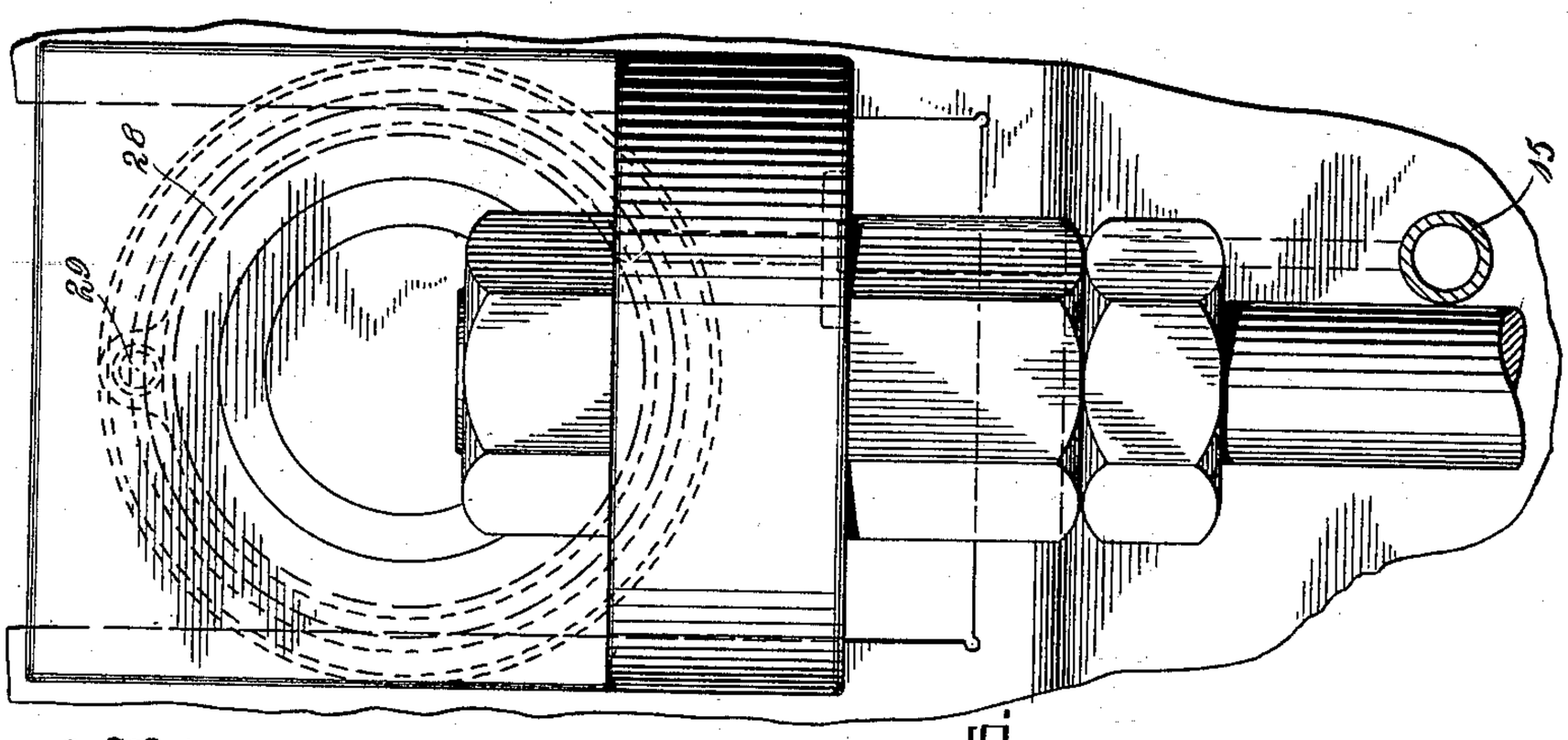

FIG. 6.

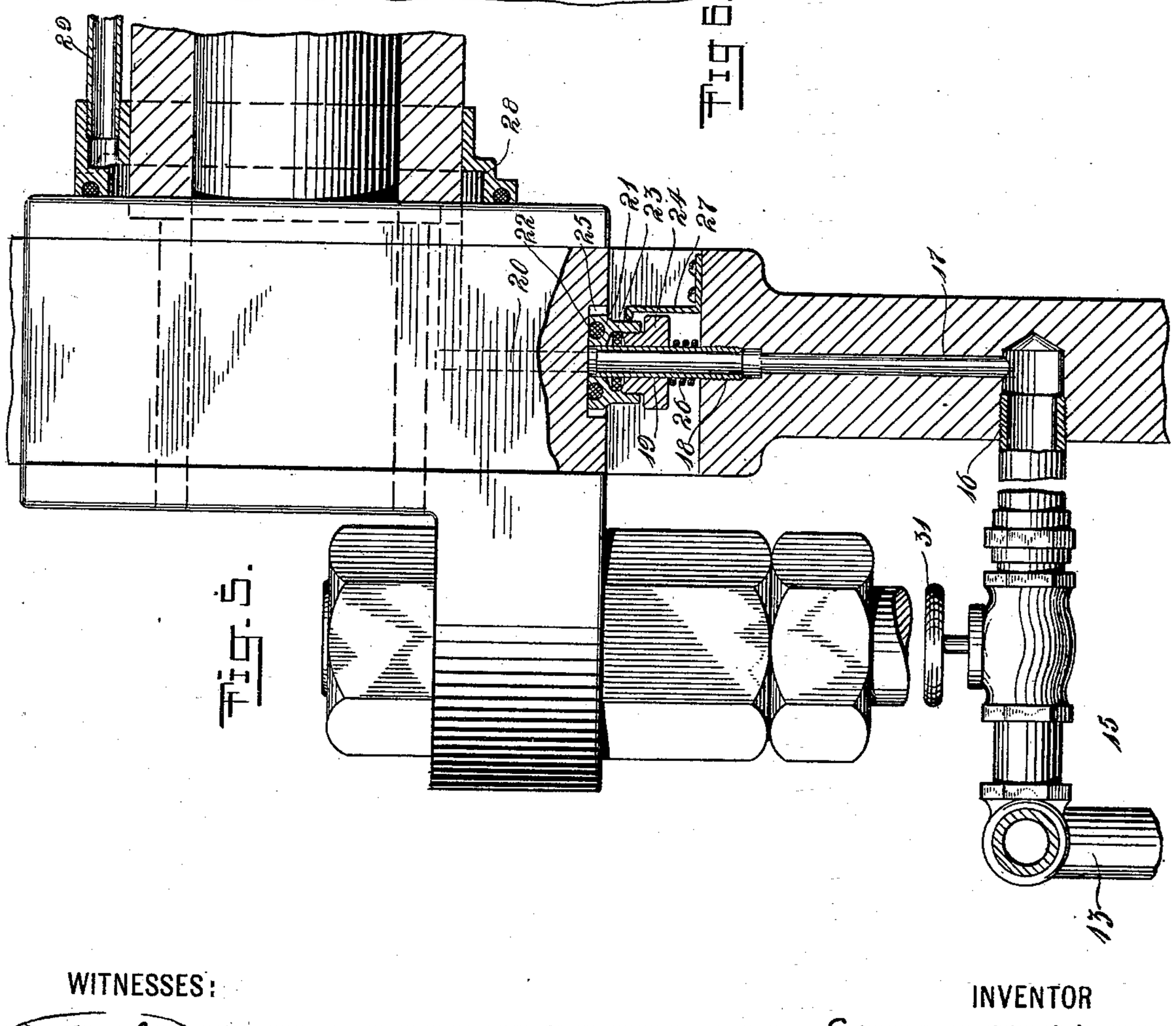

FIG. 5.

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(No Model.) 6 Sheets—Sheet 4.

FIG. 6.

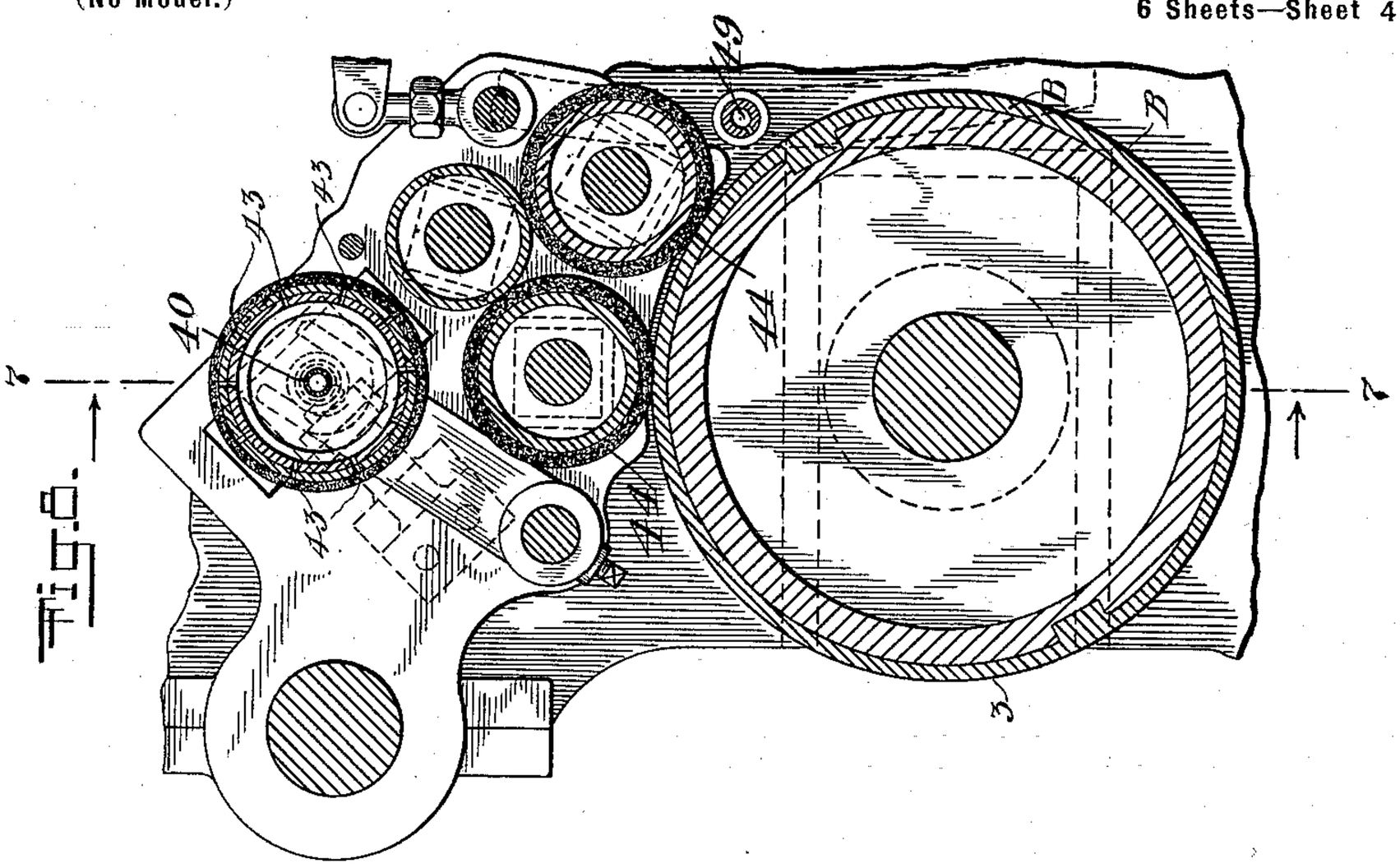
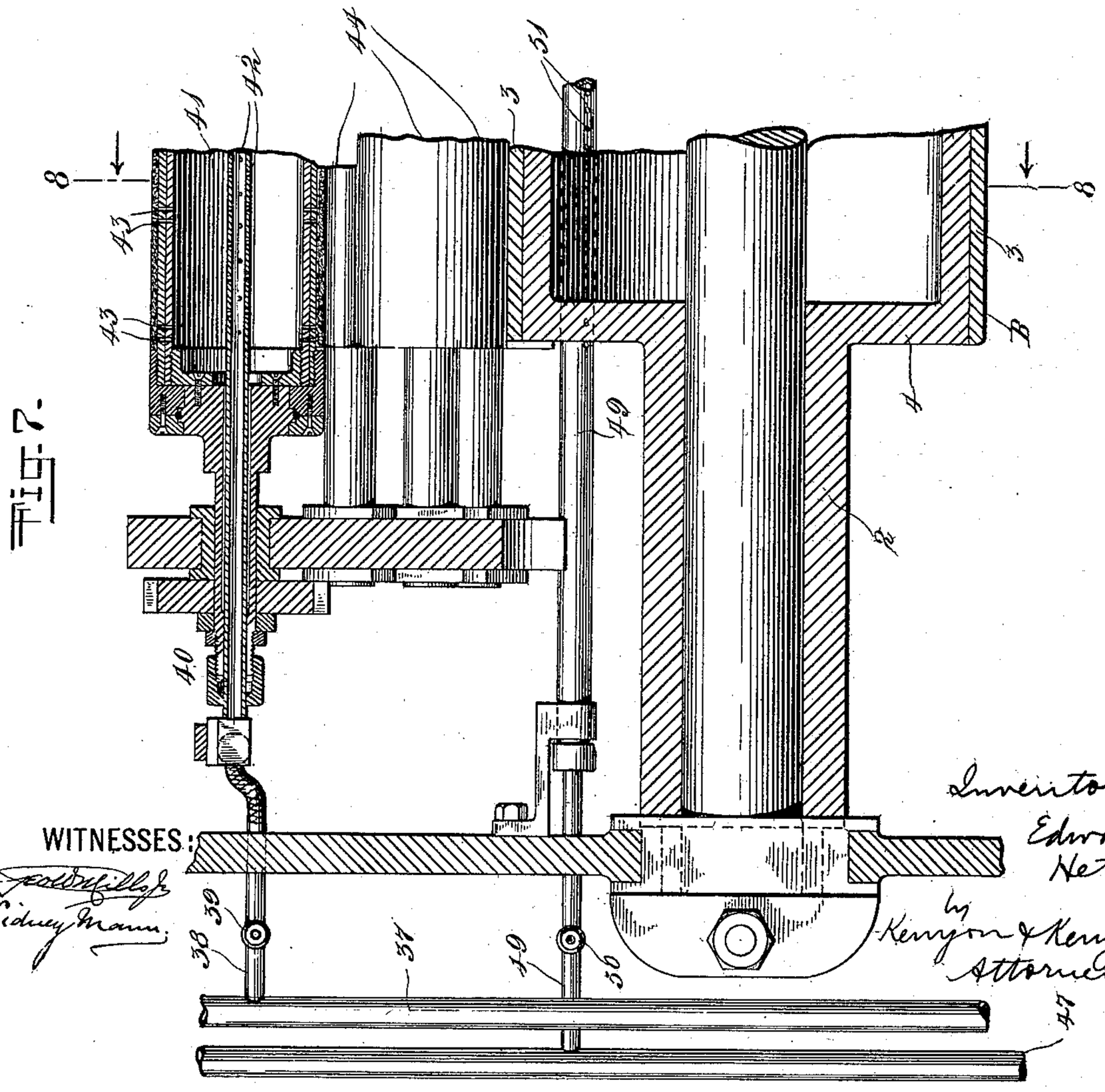


FIG. 7.



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Attorneys.

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METHOD OF AND MECHANISM FOR DAMPENING PLANOGRAPHIC PRESSES.

(Application filed Jan. 5, 1899.)

(No Model.) 6 Sheets—Sheet 5.

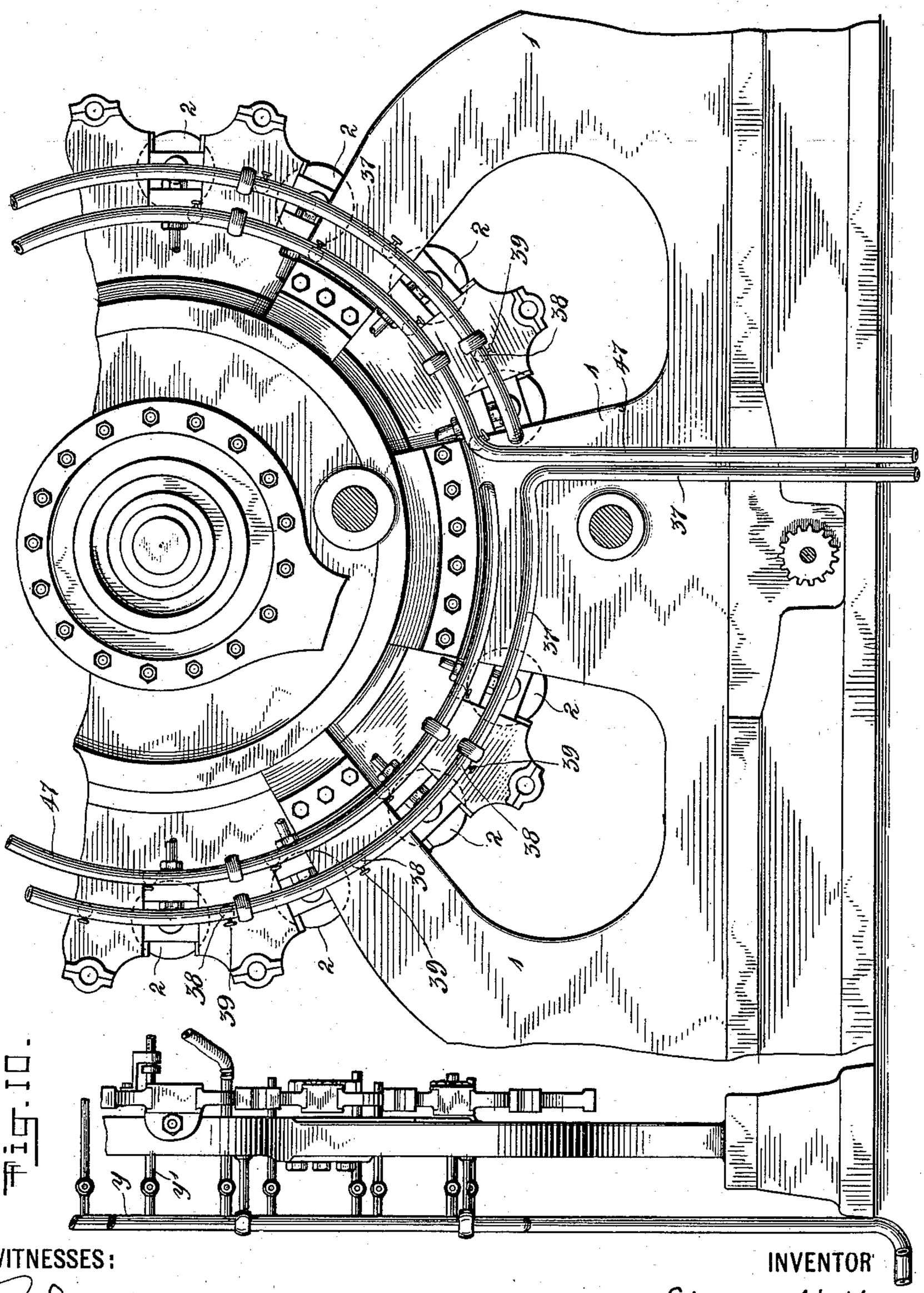

FIG. 5.

FIG. 10.

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No. 637,578. Patented Nov. 21, 1899.

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METHOD OF AND MECHANISM FOR DAMPENING PLANOGRAPHIC PRESSES.

(No Model.) (Application filed Jan. 5, 1899.)

6 Sheets—Sheet 6.

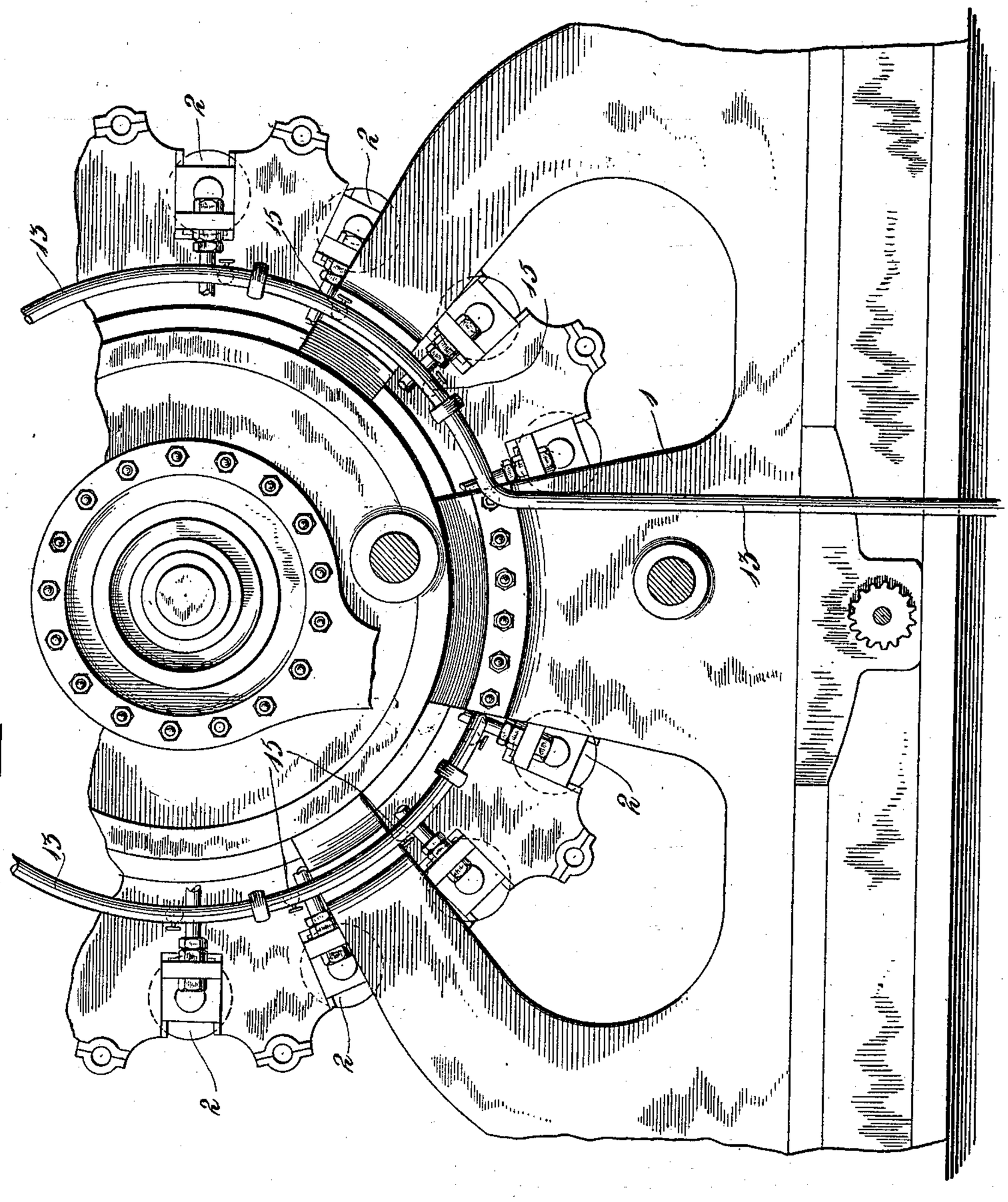

FIG. 11.

WITNESSES:

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ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD HETT, OF NEW YORK, N. Y.

METHOD OF AND MECHANISM FOR DAMPENING PLANOGRAPHIC PRESSES.

SPECIFICATION forming part of Letters Patent No. 637,578, dated November 21, 1899.

Application filed January 5, 1899. Serial No. 701,195. (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 Methods of Dampening Planographic Presses and Dampening Mechanism for Said Presses, of which the following is a specification.

My invention relates to methods for damping printing-surfaces in a planographic press and to damping mechanism in such a press.

It has for its object to provide a new and improved method for damping printing-surfaces in a planographic press and new and improved damping mechanism for such a press.

It consists of the novel devices herein shown and described.

I have illustrated in the drawings and will now proceed to describe the preferred form of my improved method and apparatus, similar parts in the different figures being represented by corresponding reference-numbers.

Figure 1 is an elevation of my fluid-pressure tank and a vertical section of a cooler and heater used therewith. Fig. 2 is a plan of the same. Figs. 3 and 4 are vertical longitudinal and transverse sections, respectively, through a printing-cylinder and its damping mechanism, Fig. 3 being taken on the line 3 3 of Fig. 4 as viewed by the arrow and Fig. 4 on the line 4 4 of Fig. 3 as viewed by the arrow. Fig. 5 is a side elevation, partly in section, of one end of the shaft of the printing-cylinder with its bearing-box and connections; and Fig. 6 is an end elevation of the same. Figs. 7 and 8 are longitudinal and transverse sections, respectively, through part of a printing-cylinder and its damping devices, Fig. 7 being taken on the line 7 7 of Fig. 8 as viewed by the arrow and Fig. 8 on the line 8 8 of Fig. 7 as viewed by the arrow. Figs. 9 and 10 are side and end elevations of parts of a multicolor-press to which my improved devices are applied, and Fig. 11 is a view of the other side of the multicolor-press.

In my improved method I force a cooling fluid, preferably air, from some suitable source of supply—as, for example, an air-pressure reservoir—to the printing mechanism, applying the cooling fluid to that side of the support carrying the printing-surface which is opposite to the printing-surface itself, thus cooling the printing-support and printing-surface, and I also force a heated moistening fluid—such, for instance, as water or vapor-laden air—to the printing-surface and apply it to such surface. In the drawings my method is illustrated as applied to a multicolor-press in which the printing-surfaces are printing-cylinders. In this form I force air from an air-pressure reservoir through a cooler, where the air is cooled to the proper degree, thence through a main supply-pipe, and from that supply-pipe through branch supply-pipes to the interior of the different printing-cylinders, thus cooling those cylinders, including the outer cylindrical printing-surfaces, and keeping them cool. I also force hot water or a heated damping solution by means of air-pressure through a main supply-pipe, and thence through branch pipes to the interior of the water-roller, from whence it proceeds outward to damping-rollers, and from thence to the printing-surface, or I force air under pressure through hot water or a heated damping solution, thus heating the air and saturating it with vapor, thence through a main supply-pipe and branch pipes to a perforated cylinder lying along and parallel to the printing-surface and blowing upon the cool printing-surface of each printing-cylinder heated vapor-laden air.

1 represents the framework of a multicolor-press, in which 2 2 are printing-cylinders. Only a part of the multicolor-press with which my improved devices are connected is shown in the drawings, as the press is substantially the same as that shown in my prior application, Serial No. 695,281, filed on the 2d day of November, 1898, the details of such a press forming no part of my present invention. In Figs. 9, 10, and 11 I have accordingly shown only such parts of the multicolor-press as are sufficient to enable the connection of my improved devices with such a press to be understood. The details of the multicolor-press will not, therefore, be further described.

Each of the printing-cylinders is preferably made hollow, as shown in Figs. 3 and 7. Each cylinder has a printing-surface on its exterior face, which may be either integral with the cylinder or may be removable from the same. In the drawings I have shown the

printing-surface as composed of hollow printing-tubes 3, adapted to be slipped over and removed from the cylindrical base or support constituting the base or support 4. I cool the printing-surface 3 and keep it cool by supplying a cooling fluid to the interior of each printing-cylinder by means of the following-described mechanism:

5 is an air-pressure reservoir which can be supplied with air under pressure in any suitable manner.

6 is a cooler for the purpose of cooling the air which is supplied to it from the air-pressure reservoir by the pipe 7. The flow of air into the cooler is regulated by a valve 8. The air passes from the pipe 7 into the bottom of cooler 6, passing around and between the coils of the cold-water pipe 9. Cold water or other suitable cooling medium is supplied to pipe 9 from any suitable source through valve 10 at the top of the cooler and is discharged through valve 11 and pipe 12 from the bottom of the cooler, as shown in Fig. 1. By these means the air from the air-pressure reservoir is cooled to the proper degree. It thence passes through main supply-pipe 13, controlled by valve 14, to branch supply-pipes 15, (see Figs. 3 and 11,) each one of which registers with an opening through one of the bearing-boxes of each printing-cylinder through elastic fluid-tight connections. These devices are as follows: The end of each branch pipe 15 is screw-threaded at 16 (see Fig. 5) to enter a cylindrical screw-threaded opening in the framework of the press supporting one of the bearings of a printing-cylinder. An opening 17 is cut through the said framework and is screw-threaded at its upper end at 18 to receive the screw-threaded end of a short pipe 19. The upper end of pipe 19 normally bears against the under side part of the bearing of the printing-cylinder and registers with an opening 20, formed in the bearing. The connections between pipe 19 and opening 20 are made fluid-tight by means of a stuffing-box device consisting of a circular plate 21, surrounding pipe 19 and having a rubber ring 22 on its face and hollowed out at its lower end to receive a washer 23 and screw-threaded interiorly to receive a screw-threaded cap 24. The plate 21 fits into a recess 25, cut in the face of the bearing and slightly larger than the plate to permit of slight lateral adjustment. A spring 26 tends to press the stuffing-box tightly against the bearing, and thus makes a fluid-tight joint. By this arrangement fluid-tight connections are made between the supply-pipe and the opening in the bearing-box, which also permit the printing-cylinder and bearing-box to be readily removed from the press and to be replaced therein. 27 is a stop to prevent the parts 21, 23, and 24 from being lost when the printing-cylinders and bearing are removed. Opening 20 in the bearing leads at its other end into a cylindrical chamber 28 in the bearing and around one end of the shaft of the printing-cylinder. This chamber runs entirely around the shaft of the printing-cylinder. A pipe 29 connects chamber 28 with the hollow interior 30 of the printing-cylinder, as shown in Fig. 3. The pipe 29 and the cylindrical chamber 28 revolve with the printing-cylinder. For this reason I make the chamber 28 cylindrical, so that opening 20 in the bearing will always open into some part of the chamber 28. By means of the cylindrical chamber 28 and pipe 29 and elastic fluid-tight connections between each branch supply-pipe and the opening in the bearing a cooling fluid can be continuously supplied to the interior of each printing-cylinder without interfering with its rotation, and each printing-cylinder and its bearing can be removed and replaced at will.

31 is a valve for controlling the supply of cool air from each branch supply-pipe 15 to its cylinder.

32 is a small orifice leading from the hollow interior 30 of the printing-cylinder to the outer air to permit a discharge into the atmosphere, so as to keep up a continuous flow of cold air into the interior of the printing-cylinder.

Fig. 11 shows the arrangement of the main supply-pipe for supplying the cooling fluid to the different branch supply-pipes leading to the interior of the different printing-cylinders.

I supply a heated moistening fluid to the printing-surface. Such a fluid may be supplied either in the shape of a liquid—as, for example, heated water or heated damping solution—or in the form of a gas—as, for example, vapor-laden air—or both may be used, if desired. In Figs. 1, 7, 8, and 9 I show devices for supplying both the liquid and the gas, and in Figs. 3 and 4 I show devices for supplying a liquid alone. Either one or the other or both may be used, as desired. The devices shown in the drawings for supplying such a liquid or gas are as follows: I will first describe the apparatus for supplying a heated liquid. Air is forced from air-pressure reservoir 5 through pipe 33 to the top of heater 34, which is made air-tight in any suitable manner. The valve 33ª controls the passage of air through pipe 33. I place in the heater water or any suitable damping solution 35, which may be heated in any suitable manner. As shown, I heat it by means of an electric heater 36, which can be constructed in any suitable manner, though the details of which, as they form no part of my present invention, are not shown in the drawings and will not be further described. The air-pressure in the upper part of the heater 34 forces hot water 35 through pipe 37, controlled by valve 38. Pipe 37 is a main supply-pipe for supplying heated liquid to the different damping mechanisms, and in the multicolor-press shown in the drawings runs to and around the multicolor-press, as shown in Fig. 9, delivering the heated liquid to

branch supply-pipes 38, each of which is controlled by a valve 39. Each of said branch pipes connects with a pipe 40, arranged to run centrally through water-roller 41, and is provided with orifices 42 to permit the escape of the heated liquid into the interior of the water-roller. From the interior of this roller it passes out through openings 43 to the outer covering of cloth or felt surrounding the water-roller, passing through this outer covering and onto the damping-rider and damping-rollers 44, and thence passing to the printing-surface of the printing-cylinder. In this way the heated moistening liquid is continuously supplied to the printing-surface and is applied to such surface. If it is desired to employ gas or a vapor-laden air, I use devices of the following-described character: Air passes from the air-pressure reservoir 5 through pipe 45, controlled by valve 46, into the bottom of heater 34, bubbles up through the heated water or dampening solution, and then passes out from the heater through pipe 47, controlled by valve 48. Pipe 47 is the main supply-pipe for supplying a vapor-laden gas to the different printing-surfaces of the press. The vapor-laden air passes through main supply-pipe 47 to and around the multicolor-press, delivering the vapor-laden air to the different branch supply-pipes 49, each controlled by a valve 50. Each pipe 49 runs along the face of the printing-surface on the face of the printing-roller parallel therewith and adjacent thereto, and the vapor-laden air or gas is blown out through holes 51 in the pipe opposite to the printing-surface. By this means I force the heated vapor-laden gas and blow it upon the cool printing-surface of the printing-cylinders, where it is immediately condensed by such contact, leaving the moisture of condensation upon said printing-surface.

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

1. The method of dampening the outer or printing surface of a planographic or other hollow printing-body, which consists in cooling the printing-surface by applying a cooling fluid to the interior of said body, and in applying a heating moistening fluid to the printing-surface of said body.

2. The method of dampening the outer or printing surface of a planographic or other hollow printing-body, which consists in cooling the printing-surface by continuously applying a cooling fluid to the interior of said body, and in continuously applying a heating moistening fluid to the printing-surface of said body.

3. The method of dampening a planographic or other cylindrical printing-surface, which consists in cooling the printing-surface by continuously applying a cooling fluid to the interior of the printing-cylinder, and in continuously applying a heated moistening fluid to the cylindrical printing-surface.

4. The method of dampening the outer or printing surface of a planographic or other hollow printing-body, which consists in cooling the printing-surface by applying a cooling fluid to the interior of said body, and in applying a heating dampening liquid to the printing-surface of said body.

5. The method of dampening a planographic or other cylindrical printing-surface which consists in cooling the printing-surface by continuously applying a cooling fluid to the interior of the printing-cylinder, and in continuously applying a heated damping liquid to the cylindrical printing-surface.

6. The method of dampening the outer or printing surface of a planographic or other hollow printing-body, which consists in cooling the printing-surface by applying a cooling fluid to the interior of said body, and in blowing upon the cooled printing-surface a heated vapor-laden gas.

7. The method of dampening a planographic or other cylindrical printing-surface which consists in cooling the printing-surface by continuously applying a cooling fluid to the interior of the printing-cylinder, and in blowing upon the cooled printing-surface a heated vapor-laden gas.

8. The method of dampening the outer or printing surfaces of planographic or other hollow printing-bodies in a multicolor-press, which consists in forcing a cooling fluid under pressure and a heated moistening fluid to the different mechanism in the press, applying the cooling fluid to the interiors of the hollow bodies and applying the heated moistening fluid to the different printing-surfaces of said bodies.

9. The method of dampening the outer or printing surfaces of planographic or other cylindrical printing-bodies, which consists in forcing a cooling fluid under pressure, and a heated moistening fluid to the different printing-cylinders in the press, applying the cooling fluid to the interior of each printing-cylinder, and applying the heated moistening fluid to the different printing-surfaces.

10. The method of dampening the outer or printing surfaces of planographic or other hollow printing-bodies in a multicolor-press, which consists in forcing a cooling fluid under pressure and a heated moistening liquid to the different mechanisms in the press, applying the cooling fluid to the interiors of the hollow bodies and applying the heated moistening liquid to the different printing-surfaces of said bodies.

11. The method of dampening the outer or printing surfaces of planographic or other hollow printing-bodies in a multicolor-press, which consists in forcing a cooling fluid under pressure, and a heated vapor-laden gas to the different printing mechanisms in the press, applying the cooling fluid to the interiors of the hollow bodies, and blowing upon the cooled printing-surfaces a heated vapor-laden gas.

12. In a planographic press the combination of a hollow printing-cylinder bearing a printing-surface, damping mechanism for

damping the said surface, a cylindrical chamber and an opening connecting therewith, arranged in one of the bearings of said cylinder, and fluid connections between the chamber and opening and the interior hollow space of the printing-cylinder on the one side and between the said cylinder and opening and a suitable source of supply of cool fluid on the other side, whereby a cooling fluid can be supplied to the interior of the cylinder to cool the printing-surface, substantially at set forth.

13. In a planographic press the combination of a hollow printing-cylinder bearing a printing-surface, damping mechanism for damping the said surface, a cylindrical chamber around one end of the shaft of the printing-cylinder, a pipe connecting said chamber with the interior of the printing-cylinder, an opening through the bearing-box connecting with said cylindrical chamber, a supply-pipe registering with the other end of said opening and connecting with a suitable source of supply of cooling fluid, fluid-tight connections between the printing-cylinder and its bearing-box and elastic fluid-tight connections between the supply-pipe and the bearing-box whereby cooling fluid can be continuously supplied to the interior of the printing-cylinder without interfering with its rotation and whereby the printing-cylinder and bearing-box can readily be removed from the press or be replaced therein, substantially as described.

14. In a planographic press the combination of a hollow printing-cylinder bearing a printing-surface, means for supplying a cooling fluid to the interior of the cylinder, whereby the printing-surface may be kept cool, damping mechanism for damping said printing-surface, and means for supplying a heated fluid to said damping mechanism, substantially as set forth.

15. In a planographic press the combination of a hollow printing-cylinder bearing a printing-surface, a cylindrical chamber and an opening connecting therewith, arranged in one of the bearings of said cylinder, and fluid-tight connections between the chamber and opening and the interior hollow space of the printing-cylinder on the one side and between the said cylinder and opening and a suitable source of supply of cooling fluid on the other side, whereby a cooling fluid can be supplied to the interior of the cylinder to cool the printing-surface, damping mechanism for damping said printing-surface and means for supplying a heated fluid to said damping mechanism, substantially as set forth.

16. In a planographic press, the combination of a series of hollow printing-cylinders, each bearing a printing-surface and each provided with damping mechanism, an air-pressure reservoir, a cooler connected therewith, a main supply-pipe leading from the cooler, branch pipes each connecting with the main supply-pipe on the one side and leading to the interior of one of the printing-cylinders on the other side, whereby a cooling fluid can be continuously supplied to the interior of the printing-cylinder to cool the printing-surface substantially as set forth.

17. In a planographic press, the combination of a series of hollow printing-cylinders, each bearing a printing-surface and each provided with damping mechanism, an air-pressure reservoir, a cooler connected therewith, a main supply-pipe leading from the cooler, branch pipes each connecting with the main supply-pipe on the one side and leading to the interior of one of the printing-cylinders on the other side, whereby a cooling fluid can be continuously supplied to the interior of the printing-cylinder to cool the printing-surface, a heater for heating a damping fluid, connections between the air-pressure reservoir and the heater, a main supply-pipe leading from the heater, branch supply-pipes each connecting on one side with the said main supply-pipe and leading on the other side to the damping mechanism of one of the printing-cylinders, whereby a heated fluid can be continuously supplied to said damping mechanism, substantially as set forth.

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

EDWARD HETT.

Witnesses:
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GEO. W. MILLS, Jr.