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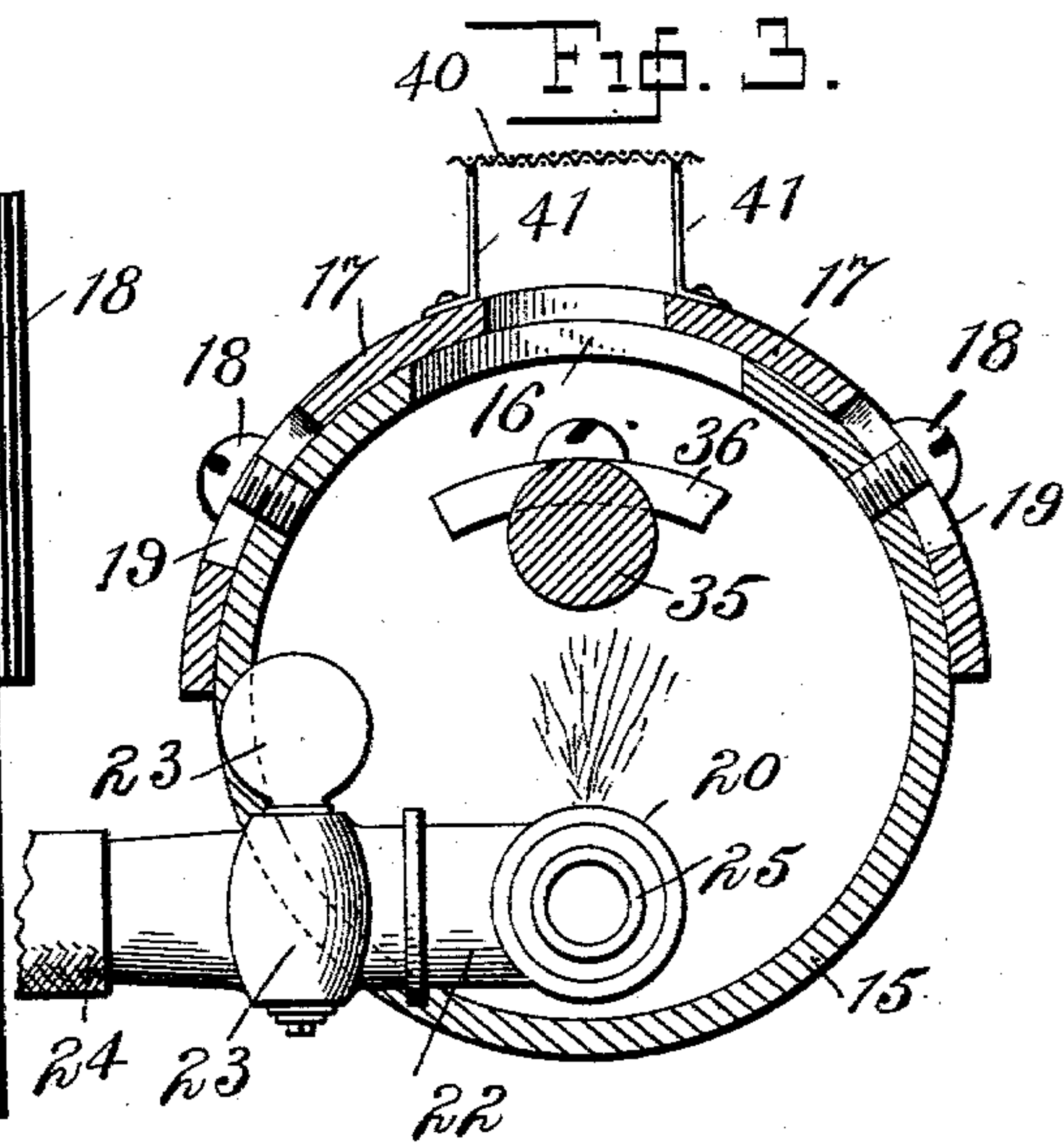
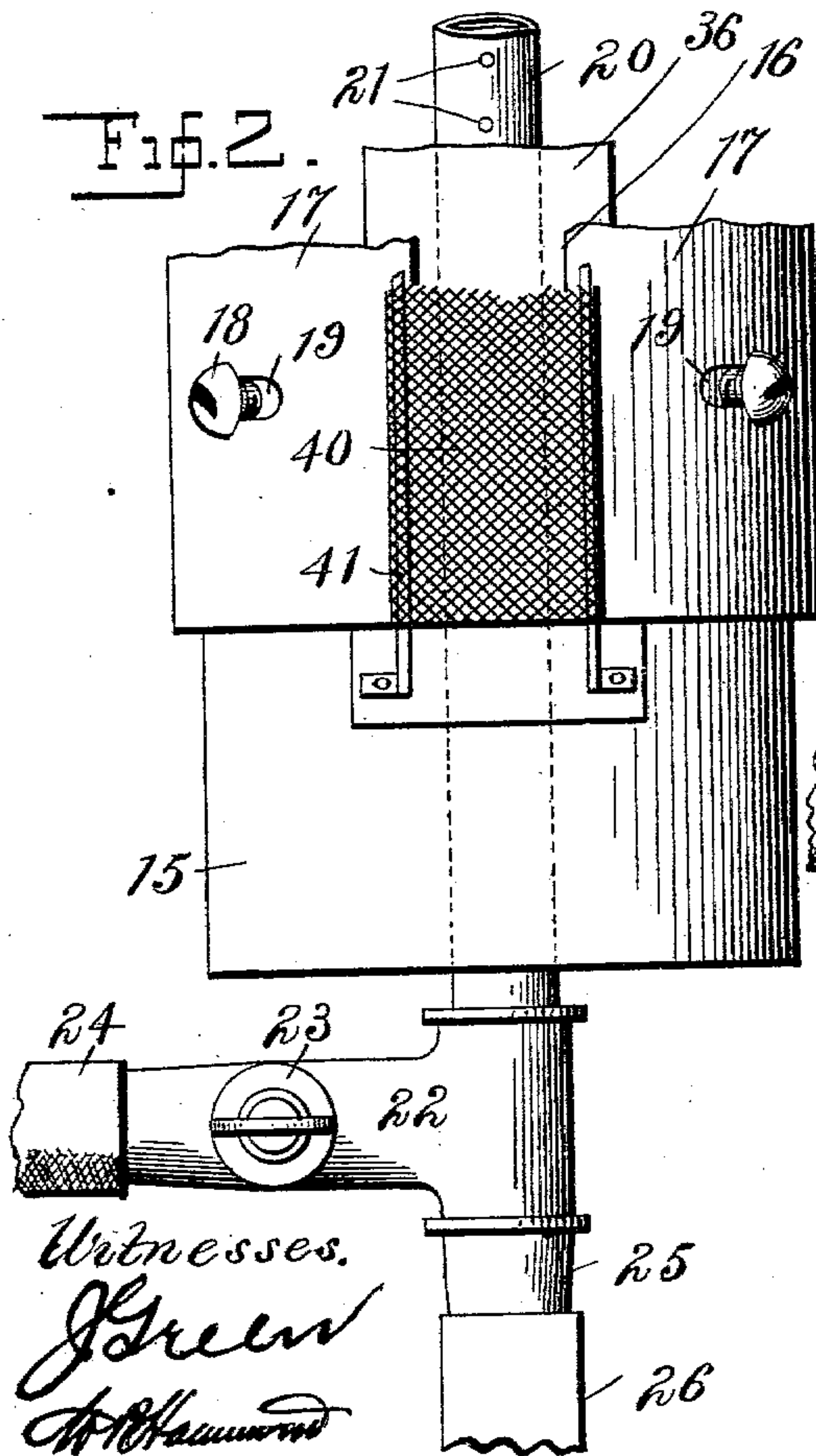
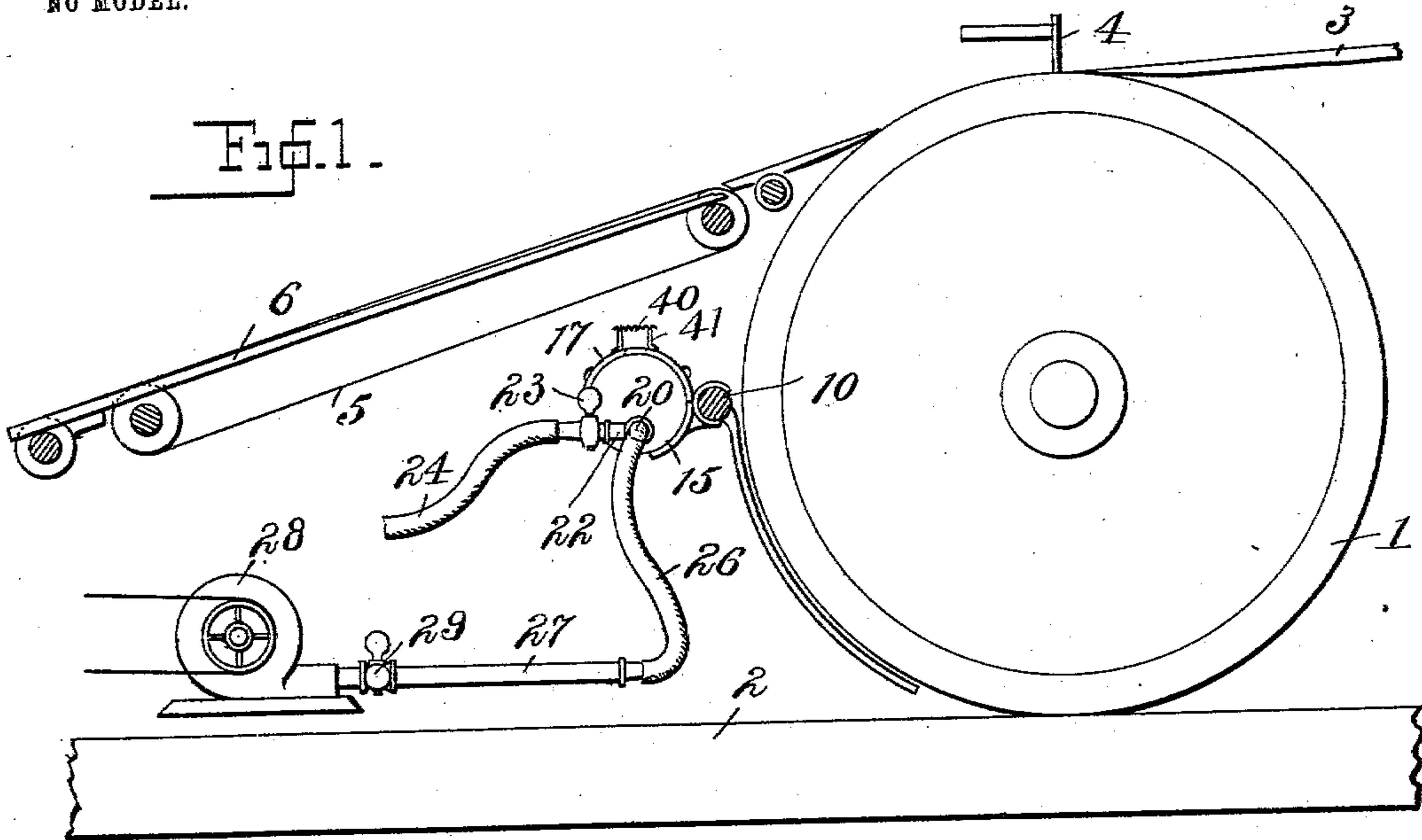
PATENTED FEB. 17, 1903.

T. C. DEXTER & T. E. BREEN.  
MEANS FOR DISSIPATING ELECTRICITY IN SHEETS OF PAPER.

APPLICATION FILED MAR. 17, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.  
*Green*  
*W. Hammond*

Inventors.  
*Thomas C. Dexter and*  
*Thomas E. Breen*  
*by Knight Bros.*  
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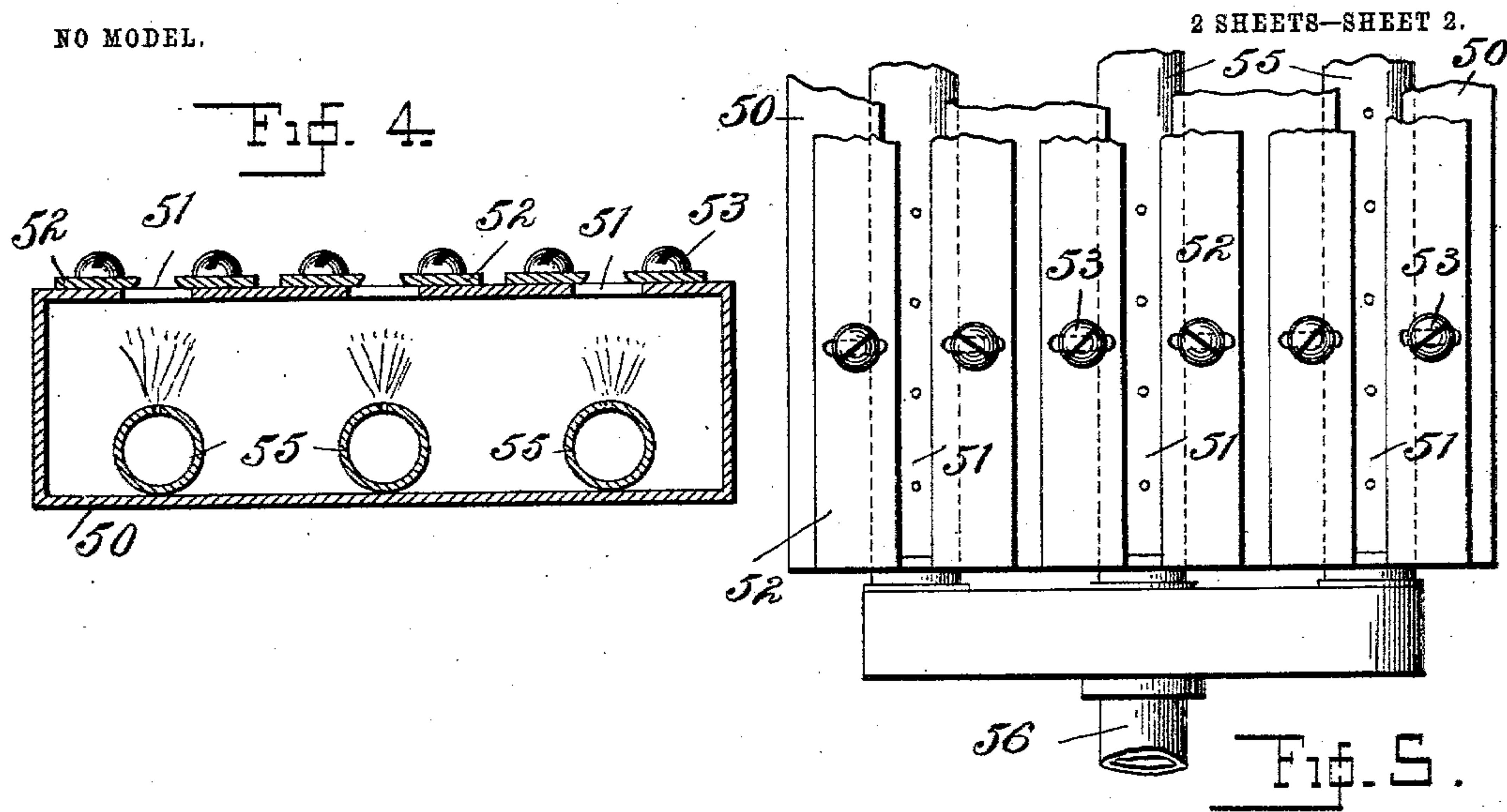
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# UNITED STATES PATENT OFFICE.

THOMAS C. DEXTER, OF PEARL RIVER, NEW YORK, AND THOMAS E. BREEN, OF COLWYN, PENNSYLVANIA.

MEANS FOR DISSIPATING ELECTRICITY IN SHEETS OF PAPER.

SPECIFICATION forming part of Letters Patent No. 720,898, dated February 17, 1903.

Application filed March 17, 1902. Serial No. 98,656. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS C. DEXTER, residing at Pearl River, in the county of Rockland and State of New York, and THOMAS E. BREEN, residing at Colwyn, in the county of Delaware and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Means for Dissipating Electricity in Sheets of Paper, of which the following is a specification.

It is well known by those skilled in the art that great difficulty is experienced in handling paper in mills and in operating printing-presses, paper-feeding machines, folding-machines, and other machines designed to operate upon paper by reason of disturbed electrical conditions or the presence of static electricity in the sheets. Such electrical disturbances are caused by certain conditions of the atmosphere and by the manipulations upon the paper in manufacturing and in printing and otherwise operating upon the sheets. Under certain conditions the paper is so completely charged with electricity or the electrical conditions are so completely disturbed that it is impossible to separate and feed the sheets to the machines without treating the sheets in some way to equalize or dispel the electricity. Sheets which have been newly printed are particularly apt to be charged with electricity.

One common method of overcoming the electricity in paper is by dampening the sheets or the atmosphere in which they are being operated upon. Another method which has been employed consists in dissipating the electricity by means of electrical conductors supported in proximity to the sheets or machines which are operating upon the paper. It has also been suggested to treat sheets of paper with jets of steam, currents of cold air, and by burning gas-jets in proximity to the paper.

We have found that the static electricity or disturbed electrical condition in sheets of paper can be effectively dissipated or equalized by treating the paper with blasts of heated air or the heated products of combustion of a mixture of air and gas, and we therefore propose to accomplish the desired

result by providing an air-blast device provided with a gas-burner and having air and gas supplies and an air-pump or blower communicating with the air-supply for subjecting the paper to the action of blasts of heated air or the heated products of combustion of air and gas. The means for heating the air or burning the mixture of air and gas and directing the heated air or products of combustion, or both, against the sheets may be applied at various points in any of the machines now commonly used for feeding, printing, folding, or otherwise operating upon sheets. We have found it very beneficial to apply our devices to printing-presses in position to treat the sheets with the heated air and products of combustion immediately after the printing operation while the sheets are passing to the delivery mechanism. The devices may also be applied to a folding-machine, or to a feeding-machine, or to paper-making machines, or any machine designed to operate upon paper in any approved manner, so as to insure the effective action of the heated air and products of combustion upon the paper.

We may equip web-machines, as well as other forms of machines, with our improved devices.

The removal of electricity or equalization of the electrical conditions of paper is not only important in facilitating the handling and operation of the paper, but is of great value in preventing the "offset" of printed sheets.

In the accompanying drawings we have illustrated several structures which embody our invention, and in order that our invention may be fully understood we will first describe the same with reference to the said drawings and afterward point out the novelty with more particularity in the annexed claims.

In said drawings, Figure 1 is a diagrammatic side elevation of part of a printing-press having one form of our improved electricity-dissipating device applied thereto for treating the successive sheets of paper as they pass to the delivery-fly. Fig. 2 is a detail plan view, partly broken away, of a portion of the same form of the device shown in Fig. 100



1. Fig. 3 is a detail transverse sectional view of the same. Figs. 4 and 5 are respectively a detail transverse sectional view and a detail partial plan view of a modified form of the air and gas mixing, burning, and supplying device.

Referring first to Figs. 1, 2, and 3, 1 represents an impression-cylinder of a flat-bed printing-press; 2, the impression-bed; 3, the ordinary feed-board; 4, the ordinary front guides; 5, the delivery-tapes, and 6 the oscillating delivery fly-sticks. Upon a transverse rod or brace 10 of the printing-press we mount our improved air and gas mixing, burning, and supplying device, which in the figures referred to comprises a cylindrical tube or shell 15, extending transversely of the press and having a longitudinal slot 16 cut through its upper face, which slot is adjustable in width by means of the curved plates 17, held adjustably upon the tube 15 by means of screws 18, operating in slots 19. Located within the tube 15 is a gas-burner pipe 20, formed with a series of small orifices or burner-openings 21 and communicating at one end with a gas-supply pipe 22, having a regulating-cock 23. The short section of pipe 22 has a flexible hose or tube 24 communicating with it to lead gas from any suitable source. 25 is an air-supply pipe, also leading to the burner-pipe 20 and having a flexible hose connection 26 leading from the supply-pipe 27 of the air-pump or blower 28, which is adapted to be operated in any suitable manner. A cock 29 in pipe 27 regulates the supply of air from the blower to the burner-pipe 20. A rod or bar 35 is also mounted within the shell 15, and supported upon this bar 35 is a curved shield or plate 36, which rests directly beneath the slot or opening 16 of the shell 15 and above the burner-pipe 20, so that the gas-flames burning at the jets or orifices 21 are confined within the tube 15 and the burning of the sheets of paper passing over the device is prevented. In place of or in addition to the shield 36 we may employ a shield or screen 40 of wire gauze or netting. This screen 40 is supported upon a frame 41, extending up from shell 15, just above the slot or opening 16. It prevents the possibility of sheets or parts of sheets dropping into the flame of the burner.

In Figs. 4 and 5 we show a modification in which the air and gas burning and supplying device is in the form of a rectangular box 50, having a series of slots 51 in its upper face, which slots are regulated as to their width by means of the adjustable plates 52, mounted at each side of the slots by means of screws 53. Directly beneath the slots 51 within the box 50 are arranged the combined air and gas pipes 55, which receive the mixed air and gas from a supply-pipe 56. In this form of the device there is no shield arranged directly above the flames, which burn at the orifices 56 in pipes 55.

In starting the operation of our device, as

shown in Figs. 1 to 5, the gas is first turned on and lighted at the burner-pipe 20 and then the air from pump or blower 28 is turned on. The supply of gas and air is regulated to form the proper combustible mixture, which will burn with a colorless flame within the shell 15, the heated products of combustion and air being forced up through opening 16 into contact with the passing sheets of paper.

Our invention may be applied to any form of machine for making or handling paper.

Our invention may be applied to machines operating upon webs of paper as well as upon sheets.

In applying the invention to large machines it is sometimes desirable to employ two or more of the devices to treat the paper at different points. For instance, in a printing-press the paper may be treated as it enters the machine just prior to the printing operation and again as it leaves the machine just after the printing operation. In some cases we merely heat the air which is blown against the paper, whereas in other cases we actually burn or partially burn the air mixed with gas and treat the paper with the heated products of combustion. The best results are obtained by treating the sheets singly as they move through the machine operating upon them; but paper in rolls or piles may be treated with beneficial results.

While the main important result obtained by the use of our means of dissipating electricity in sheets is to facilitate the operation of machines upon sheets or the handling of the paper, we would call particular attention to the fact that the dispelling of electricity or the equalization of the electrical conditions of paper is of very great importance to the printing trade, because it almost entirely obviates the difficulty heretofore encountered by reason of the offsetting of printed sheets one upon another. This offset of the sheets is overcome by our invention because of the counteraction of the tendency of the sheets to attract each other and adhere by reason of the electrical influences. This attraction among sheets charged with static electricity is very pronounced, and it will be clear to those skilled in the art that the pressure of the sheets into close contact by such attraction will invariably result in an offset of the printing. If the electrical conditions are equalized and the tendency of the sheets to attract each other is counteracted, there will always be a thin film of air interposed between the adjacent sheets, and this will prevent the offset.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. In combination with a machine adapted to operate upon sheets of paper, an air-blast device having an outlet for the blasts of air, a gas-burner pipe located in said air-blast device, a gas-supply pipe communicating with said burner-pipe, an air-supply pipe also



communicating with said burner-pipe, and an air-pump or blower communicating with said air-supply pipe, substantially as set forth.

2. In combination with a machine adapted to operate upon sheets of paper, an air-blast device comprising a suitable chamber having an outlet for heated air, and a gas-burner pipe located in said chamber, a gas-supply pipe communicating with the burner-pipe, an air-supply pipe also communicating with the burner-pipe, an air-pump or blower communicating with the air-supply pipe, and means for regulating the quantity of air forced through said air-supply pipe, substantially as set forth.

3. In combination with a machine adapted to operate upon sheets of paper, an air-blast device comprising a suitable chamber having an outlet for heated air, and a gas-burner pipe supported in said chamber, gas and air pipes communicating with said burner-pipe, an air-pump or blower communicating with the air-supply-pipe, and a shield mounted within said air-blast chamber between the burner-pipe and the outlet for heated air, substantially as set forth.

4. In combination with a machine adapted

to operate upon sheets of paper, an air-blast device comprising a suitable chamber having an outlet for heated air, and a gas-burner pipe supported in said chamber, gas and air pipes communicating with said burner-pipe, an air-pump or blower communicating with the air-supply pipe, and a perforated shield mounted above the outlet-opening of the air-blast device.

5. In combination with a machine adapted to operate upon sheets of paper, an air-blast device comprising a suitable chamber having an outlet for heated air and a gas-burner device located within the chamber, plates adjustably mounted upon the air-blast device adjacent to the outlet-opening and adapted to increase or decrease the size of said outlet-opening, gas and air supply pipes communicating with said burner-pipe, and an air-pump or blower communicating with said air-supply pipe, substantially as set forth.

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