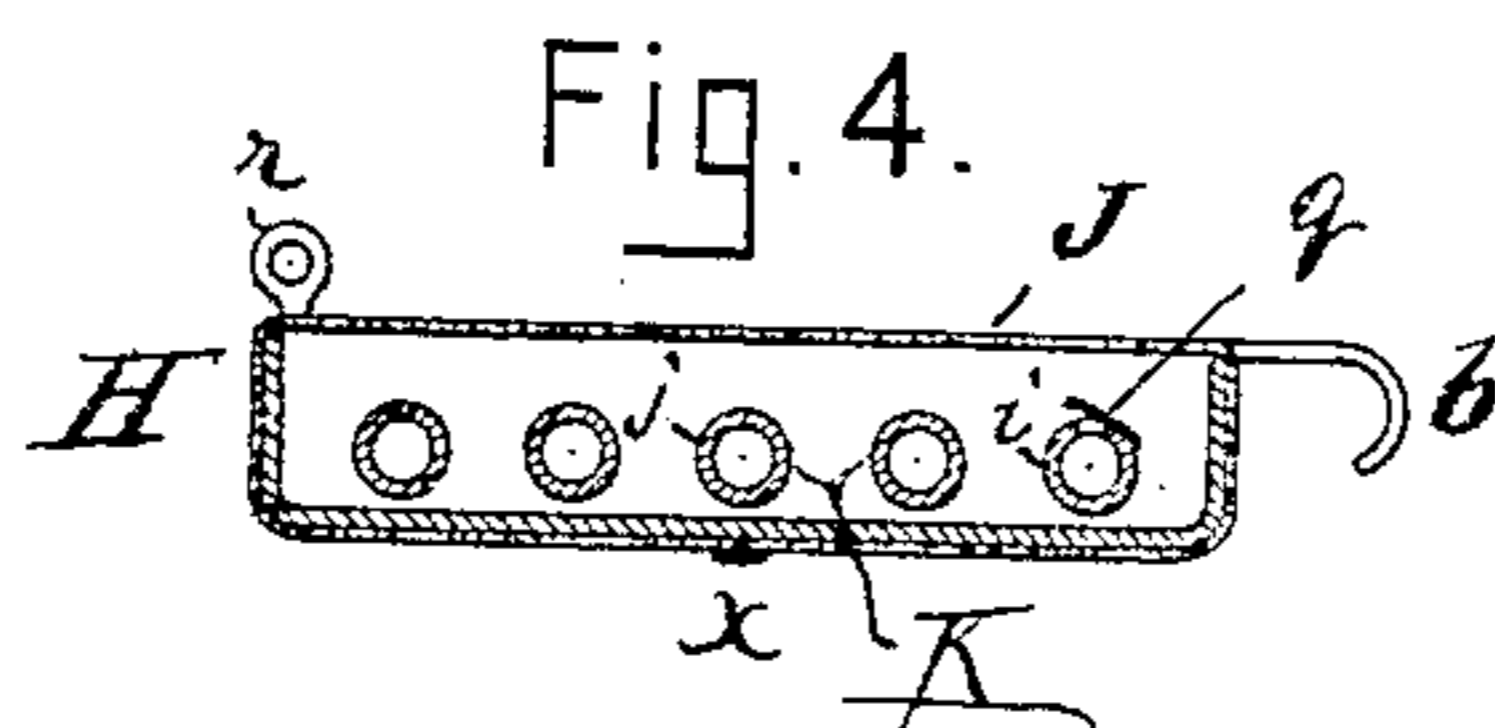
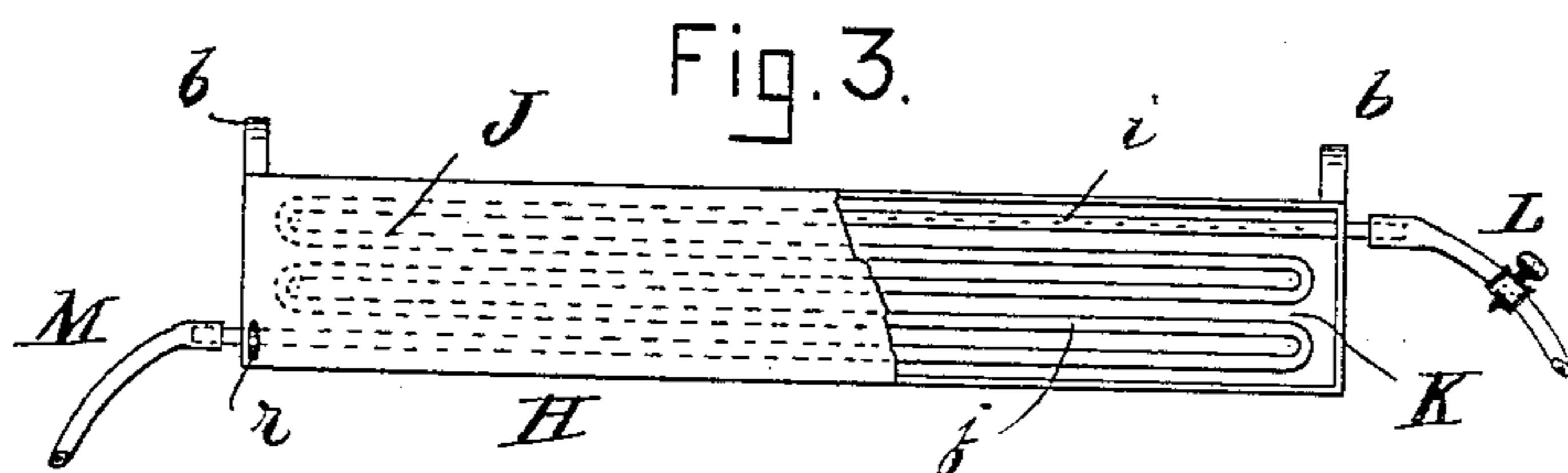
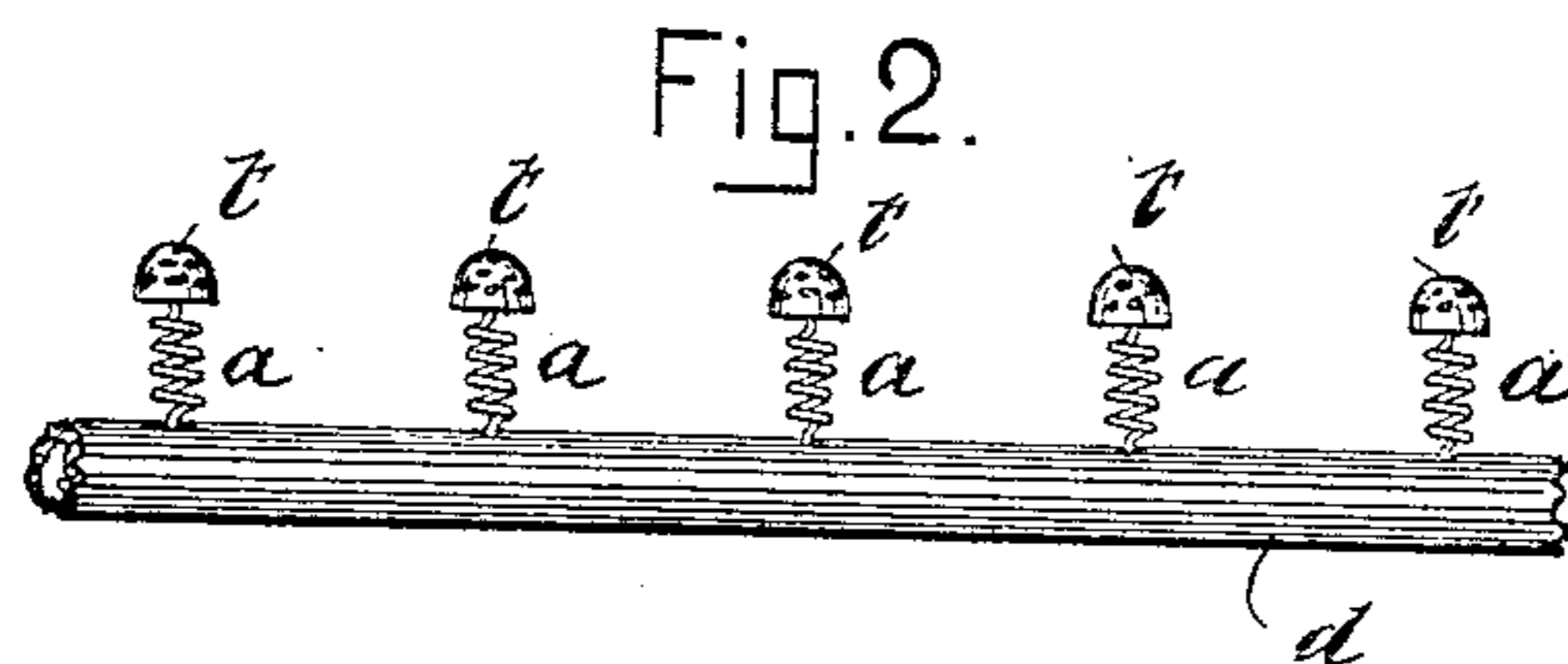
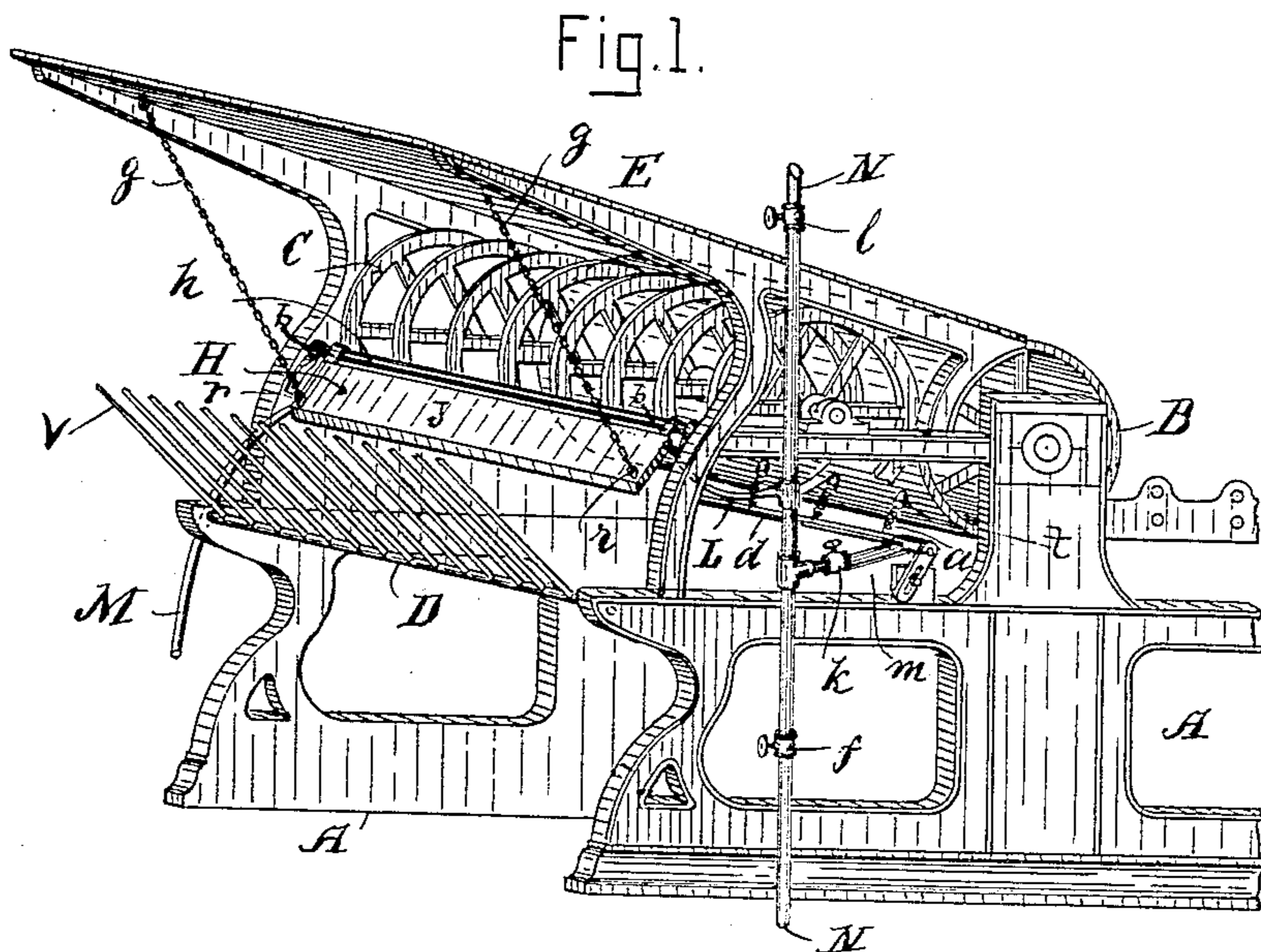


(No Model.)

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METHOD OF AND APPARATUS FOR DISSIPATING ELECTRICITY IN
DELIVERING SHEETS FROM PRINTING MACHINES.
No. 391,820. Patented Oct. 30, 1888.



Witnesses.

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UNITED STATES PATENT OFFICE.

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METHOD OF AND APPARATUS FOR DISSIPATING ELECTRICITY IN DELIVERING SHEETS FROM PRINTING-
MACHINES.

SPECIFICATION forming part of Letters Patent No. 391,820, dated October 30, 1888.

Application filed June 28, 1886. Serial No. 206,441. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM C. ROSSNEY, of Hyde Park, in the county of Norfolk, State of Massachusetts, and CHARLES L. HUNT, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Methods of and Apparatus for Dissipating Electricity in Delivering Sheets from Printing-Machines, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an isometrical perspective view of a printing-press embodying our improvements, certain parts of the press not deemed essential to show the invention being omitted and a portion of the delivery-cylinder represented as broken away; Fig. 2, a side elevation of one of the steam-pipes and its nozzles detached; Fig. 3, a top plan view of the steam-box detached, a portion of the covering being represented as removed to show the pipes; and Fig. 4, a vertical transverse section of the steam-box.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

It is well known to nearly all practical printers that in printing-presses in which a "fly" or equivalent device is employed for receiving the printed or partially-printed sheets and piling them on the delivery-table much loss of time and waste of stock results from the effects of the electricity which is developed or generated by the machinery during the operation of printing, the sheets being thereby caused to adhere to the fingers of the fly and prevented from being properly delivered and piled, and also caused to adhere to each other after leaving the fly or when in the pile. Our invention is designed to obviate these difficulties or objections, and to that end we make use of means which will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the frame of the press; B, the printing-cylinder; C, the delivery-cylinder; D, the fly or fly-frame, and E the feed-board, these parts all being of the ordinary form and construction in machines of this pattern.

Disposed beneath the feed-board E in front of the delivery-cylinder C there is a steam-box, H, which may be of any suitable width and depth, and which corresponds approximately in length with the length of the delivery-cylinder. The sides, ends, and bottom of the box may be composed of metal, wood, or any other suitable materials and are united by steam-tight joints. The top is composed of cloth or muslin, and, for convenience in securing it in position, is extended to envelop the sides and bottom, the edges of the piece of cloth of which it is composed being sewed together beneath the box at *x*. It may, however, be of the same size of the bottom, or of any other suitable size, and be secured in any convenient and suitable manner.

Disposed within the box H there is a coil of pipe, K, the ends of which extend through the ends of the box, and are respectively connected with the induction-pipe L and eduction or exhaust pipe M, the pipe L being connected by a suitable coupling with the supply-pipe N and the pipe M led out of the building or into a tank for receiving the water of condensation.

Disposed horizontally nearly beneath the delivery-cylinder C there is a steam-pipe, *d*, which is connected with the supply-pipe N by means of the connecting-pipe *m*, said last-named pipe being provided with a stop-cock, *k*, and said supply-pipe with stop-cocks *f* *l*.

Projecting upwardly from and opening into the pipe *d* there are a series of short coiled pipes, *a*, provided at their outer ends with spray-nozzles *t*.

The box H is provided at its rear side with two hooks, *b*, which, when the box is in use on the press, are hooked over the finger bar or rod *h*, thereby hinging the box to said rod and enabling it to be readily detached whenever desired. At the top of the box, near its front, there are two screw-eyes, *r*, and secured to the

eyes are chains *g*, the upper ends of which are secured to eyes in the under side of the feed-board *E*, the chains being of such length as to suspend the box *H* at an angle of about forty-five degrees, or in such a position that when the fingers *v* of the fly are resting on the finger-rod *h* preparatory to receiving the printed sheet from the press they will be approximately in parallelism with the top *J* of the box. Any othersuitable means than the hooks *b* and chains *g* may, however, be used for supporting and properly adjusting the box, if desired. A section of the pipe *K* within the box *H* is perforated, as shown at *i*, and one or more sections or coils are left without perforations, as shown at *j*. An inclined guard or deflector, *q*, (see Fig. 4,) is connected with the perforated section *i*, against which the steam impinges and is deflected over or in the direction of the imperforated section or coils *j*. This guard consists, preferably, of a piece of sheet metal, which is secured to the pipe at that side of the same which is nearest the hooks *b*, its length corresponding with the length of the perforated section of the pipe.

In the use of our improvement, the supply-pipe *N* being connected with any suitable boiler or steam-generator, (which it is not deemed essential to show,) the stop-cocks *k* *l* are closed and the stop-cock *f* opened, thereby permitting the steam to pass into the box *H* through the pipe *L*, where it will be discharged through the perforations *i* against the guard *q* and deflected over the coils *j*, and when the box is filled be forced through the cover *J*, by which it will be diffused, and thereafter come into contact with the printed sheet as it passes from the delivery-cylinder onto the fingers *v* of the fly, in a manner which will be readily obvious without a more explicit description. The moist steam or vapor, being a good electrical conductor, serves to instantly and perfectly extract the surplus electricity from the paper or to neutralize its effects, and thus prevent the printed sheets from unduly adhering to the fingers of the fly or to each other in the pile on the receiving-table.

When the paper is highly calendered or very thick, and also in certain conditions of the atmosphere, it has been found necessary sometimes, in order to properly discharge the surplus electricity or to neutralize its effects, to apply steam to the paper beneath the delivery-cylinder *C* and printing-cylinder *B*, or between the same. To accomplish this we make use of the auxiliary steam-pipe *d*, pipes *a* *m*, and nozzle *t*, by means of which steam may be applied to the paper before it is delivered from the cylinder *C*, the stop cock *k* being of course opened to let the steam into the pipe *d*. As the steam is discharged into the box *H* through the perforations *i* it will be condensed and converted into water to a certain extent, and in order to prevent this as far as possible the section or coil *j* is left imperforated, whereby the temperature of the steam in the box will be

kept nearly the same as it is in the pipes, thereby largely preventing condensation.

The essential or principal feature of our invention consists in applying steam to the paper as it passes through the press for the purpose of extracting the surplus electricity therefrom or neutralizing its effects, and thereby preventing the sheets of paper from unduly adhering to the fingers of the fly or to each other, and we do not, therefore, confine ourselves strictly to the means or devices shown for applying the steam, as any suitable means or device for this purpose may be employed. Neither do we confine ourselves to applying the steam to the paper at any particular point on its route through the press, nor to applying it at more than one point. We deem it preferable to apply the steam to the paper at the point where it passes onto the fingers of the fly; but we also apply it beneath or between the delivery and printing cylinders when required, as described.

In presses constructed differently from that shown in the drawings it will of course be necessary to vary the construction and arrangement of the device for applying steam accordingly, the steam being applied to the paper at one or more points at the same time, as desired.

Instead of using a cloth cover or top, *J*, for the box *H*, a wire-cloth or reticulated fabric may be employed, several thicknesses being used when necessary, the object of the cloth being to "muffle" and diffuse the steam properly, or to prevent it from being discharged in jets against the paper.

We sometimes cover the spray-nozzles *t* with cloth; but by providing them with numerous fine perforations and using the steam in the pipe *d* under a low pressure the cloth may be omitted.

It will be obvious that as the sheets leave the delivery-cylinder *C* and pass onto the fingers *v* of the fly they will pass through the volume of steam emitted from the box *H*, or be enveloped thereby, although it is deemed unnecessary in carrying out our invention to apply the steam to but one side of the paper.

It is generally supposed that when the paper in passing through the press reaches the fly it is in a positive state of electricity, or contains a surplus of electricity, and that, relatively speaking, the fly is in a negative state, and hence they attract each other, and the paper is caused to adhere to the fingers. This theory is not, however, fully sustained by such experiments as have from time to time been made to equalize the electrical states of the paper and the surrounding parts of the press, and therefore the action of the steam in fully neutralizing the effects of the electricity on the paper is considered somewhat phenomenal.

It is not deemed essential in order to fully illustrate our improvement to show all of the operative parts of the press, and hence many of the parts have been omitted in the drawings.

Having thus explained our invention, what we claim is—

1. The herein-described mode of freeing paper from electricity to prevent set-off in printing, said mode consisting in projecting steam onto the printed sheets as they are delivered from the press, substantially as set forth.
2. The mode of freeing paper from electricity in printing to prevent set-off, said mode consisting, essentially, in passing the sheets of paper through a volume of steam projected into the pathway of the sheets during their passage from the feed to the fly, whereby the sheets will be enveloped or partially enveloped in steam, substantially as set forth.
3. In a printing-press, the combination, with the sheet-delivery mechanism, of a steam moistening apparatus.
4. In a printing-press, the combination, with the sheet-delivery mechanism, of a steam moistening apparatus disposed below the plane of the outer ends of the fly-fingers when the latter are in position to receive the printed sheet.
5. In a printing-press, the combination of the printing-cylinder, a steam moistening apparatus in juxtaposition thereto, a sheet-delivery mechanism, and a steam moistening apparatus in juxtaposition to the fly thereof.
6. In a printing-press, the combination, with the sheet-delivery mechanism, of a hinged steam-box below the plane of and in contact with the fly when the latter is in position for receiving the printed sheet, said box having a porous or perforated top to permit the escape of steam.
7. In a printing-press, the box H, in combination with the fly D, cylinder C, and a pipe through which steam may be supplied to said box, substantially as described.
8. The box H, provided with the cover J, pipes L M, perforated section or pipe *i*, and imperforated pipe or section *j*, in combination with the fly D and cylinder C, substantially as described.
9. The box H, provided with the pipes L M, cover J, hooks *b*, and an interiorly-disposed steam-pipe, substantially as set forth.
10. The box H, provided with an interiorly-disposed steam pipe, cover J, pipes L M, and hooks *b b*, in combination with the chains *g*, rod *h*, and means for supporting said chains, substantially as described.
11. In a device for neutralizing the effects of electricity in a printing-press, the box H, provided with the pipes M L, in combination with the pipe *d*, provided with a suitable discharge-orifice, and the pipes N *m*, substantially as described.
12. The guard or deflector *q*, in combination with the perforated section or pipe *i* in the box H, substantially as described.
13. In a printing-press, the combination, with the sheet-delivery mechanism, of a steam moistening apparatus disposed immediately in front of the delivery-roll and beneath the outer ends of the fly-fingers when the latter are in position to receive the printed sheet.
14. In a printing-press, the combination, with the sheet-delivery mechanism, of a box provided with a steam-induction pipe and with a permeable cover through which steam is diffused.
15. In a printing-press, the combination, with the sheet-delivery mechanism, of a box provided with a steam-induction pipe, an outlet-pipe for condensed steam, and a permeable cover through which steam is diffused.

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