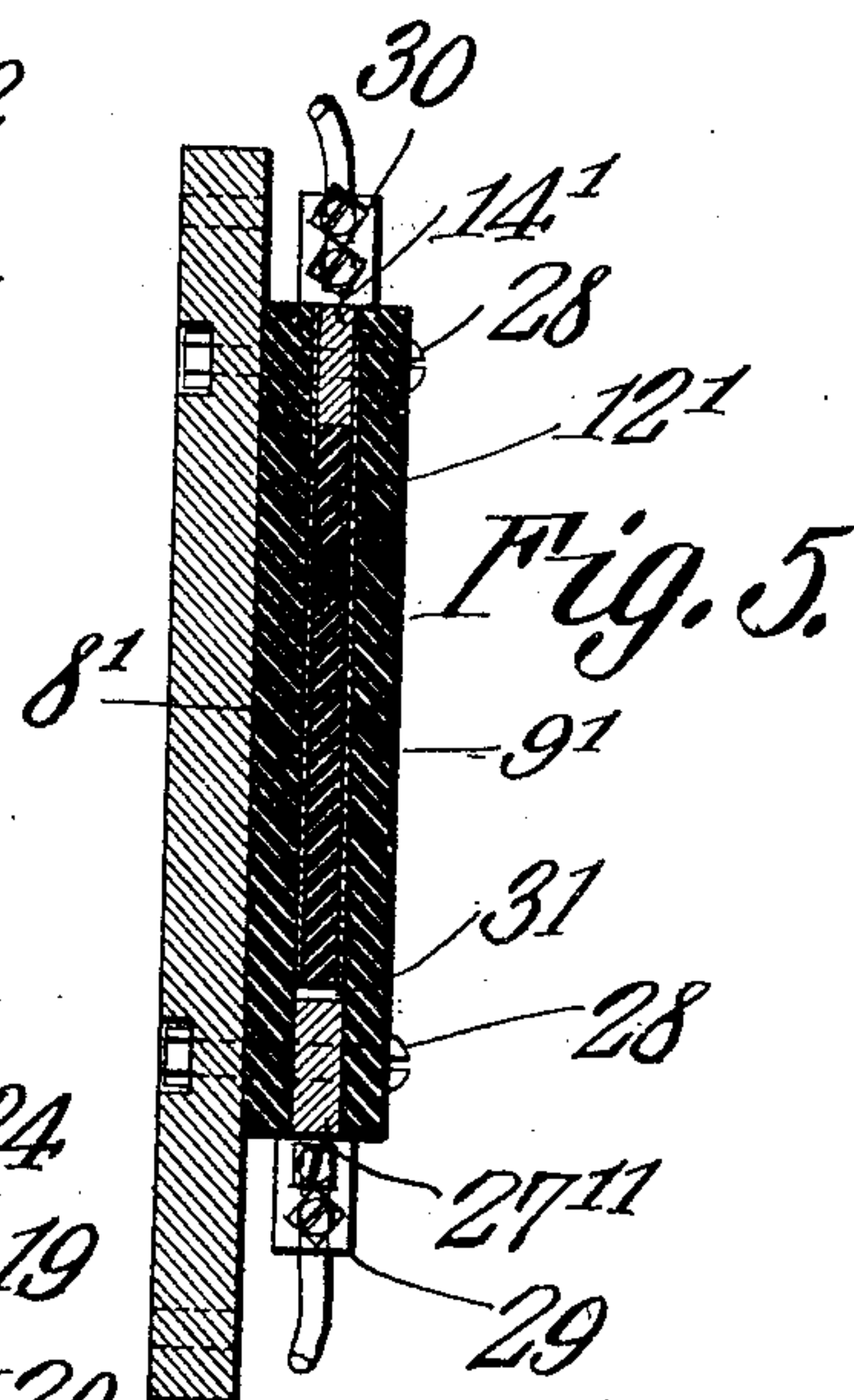
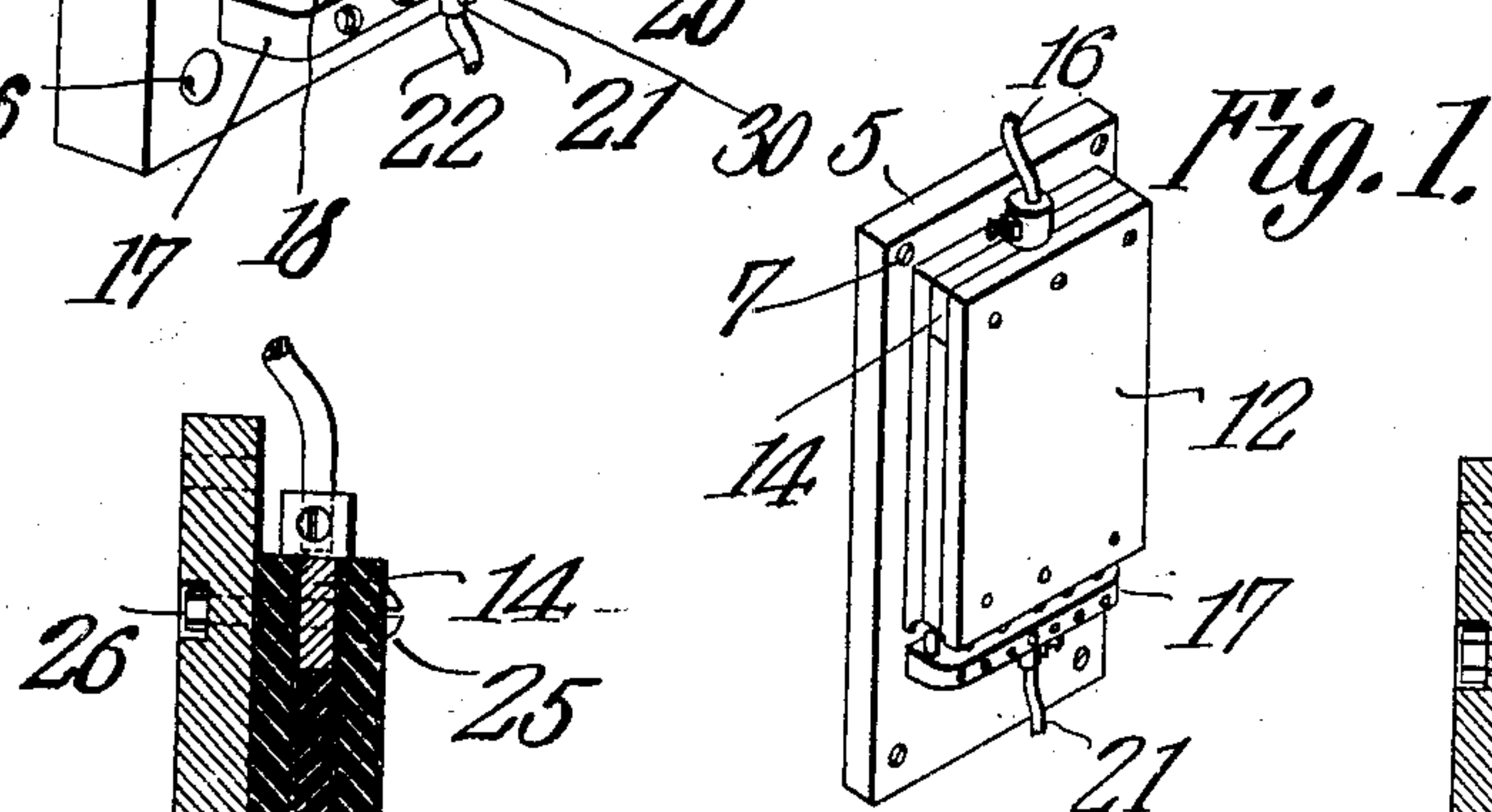
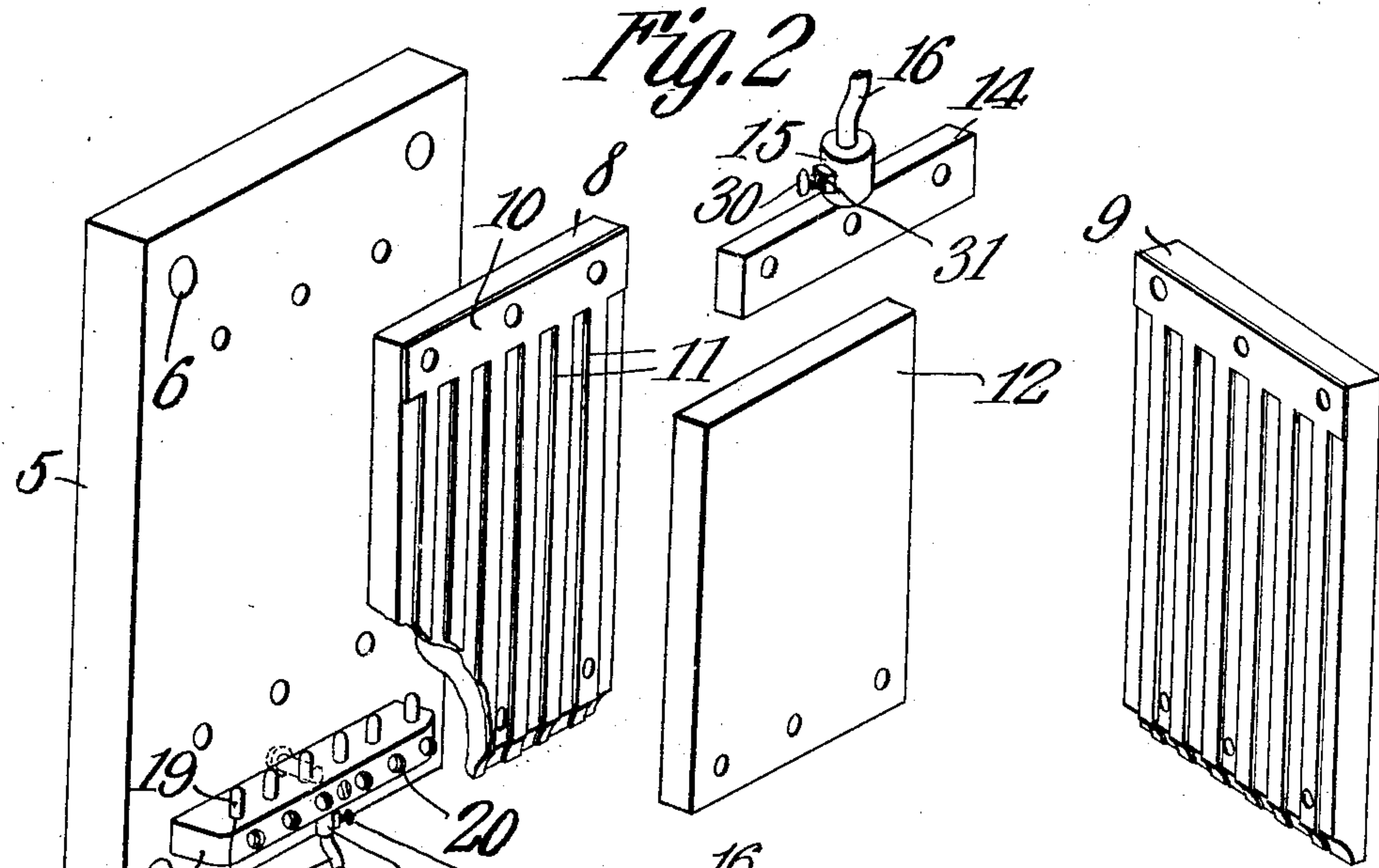


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 LIGHTNING ARRESTER.
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919,569.

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LIGHTNING-ARRESTER.

No. 919,569.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM GIFFORD, a citizen of the United States, residing at Traverse City, in the county of Grand Traverse and State of Michigan, have invented a new and useful Lightning-Arrester, of which the following is a specification.

This invention relates to lightning arresters of that general class employed for protecting electrical apparatus and circuits from injury by charges of static electricity, the present invention being particularly effective for street car service where a very sensitive non-arcing arrester is required.

The object of the invention is to provide a lightning arrester in which the static charge from the line is conducted to the ground by means of a bank of high resistance conducting paths, disposed parallel with each other and each connected in series with an air gap, the resistance of the conducting paths being such that the current at line voltage cannot pass the air gap.

A further object of the invention is to provide a multiple discharge arrester that is sensitive in operation and positively non-arcing and non-inductive, the construction and relative disposition of the several parts being such as to produce a compact rigid structure having no moving parts or coils to become short circuited, and which will neutralize all disturbances due to surging and keep the line free from all static accumulations.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification: Figure 1 is a perspective view of a lightning arrester constructed in accordance with my invention. Fig. 2 is a similar view showing the several parts detached. Fig. 3 is a vertical sectional view of Fig. 1. Fig. 4 is an enlarged detail sectional view. Fig. 5 is a vertical sectional view illustrating a modified form of the invention.

Similar numerals of reference indicate

corresponding parts in all of the figures of the drawings.

The improved lightning arrester forming the subject matter of the present invention comprises a base 5 formed of marble, slate, porcelain or other insulating material, said base being of any desired size or shape and provided with openings 6 for the reception of screws or similar fastening devices 7 by means of which the base may be readily attached to a wall or other suitable support.

Mounted on the exposed face of the base 5 are spaced substantially rectangular plates 8 and 9 formed of asbestos board or other fire proof material having good insulating qualities, said plates being preferably treated with a fire proof filler to render the same non-absorptive. The inner face of each plate at the top thereof is coated with a layer of graphite, carborundum, carbon or other material having a high resistance, and extending from the layer 10 and forming a continuation of the same are a plurality of vertical strips 11 also preferably formed by coating the face of the plates with said material and which constitute a bank of high resistance conducting paths for the static charge from the line.

Interposed between the plates 8 and 9 are one or more strips of asbestos 12 which may or may not be provided with conducting paths similar to the conducting paths 11, said plates and asbestos strip being rigidly secured to the base 5 by screws or similar fastening devices 13. The spacing strip 12 terminates at the layer or coating 10 and disposed between the plates at said coating is a metallic distributing bar 14 provided with a binding post 15 for connection with the adjacent end of the line wire 16.

Secured to the base 5 beneath the plates 8 and 9 is a transverse rack 17 preferably in the form of a metallic bar having sockets 18 formed therein for the reception of a plurality of vertically adjustable pins 19, said pins being locked in adjusted position by screws or similar fastening devices 20 which extend through the face of the bar 17 and bear against the pins, as shown.

Depending from the bottom of the terminal carrying bar 17 is a binding post 21 having a conductor 22 secured thereto for grounding the static charge from the line.

The terminals of the pins 19 are disposed in vertical alinement with the filling or spac-

ing strip 12 and are spaced from the plates 8 and 9 to form an intermediate bank of air or spark gaps 23, the inner faces of the plates 8 and 9 being beveled or rounded at 24 and tipped with metal or a coating of carborundum or other material similar to the coating forming the conducting paths 11. The conducting paths 11 are disposed parallel with each other and in series with the bank of air or spark gaps 23, the spacing or filling strip 12 serving to keep the static discharge divided until it reaches the bar 17.

By forming the conducting paths on the plates 8 and 9 and curving or beveling the ends of said plates at the pins 19 a double discharge is obtained at each pin, as best shown in Fig. 4 of the drawings.

The upper distributing bar 14 is locked in position by bolts or screws 25 which extend through the plates 8 and 9 and also pierce the base 5, there being sockets or counter-sunk portions 26 formed in the rear face of the base to receive the heads of the bolts or screws 13 and 25, as shown.

It will thus be seen that the static charge enters the arrester through the binding post 15 and is immediately distributed to the several conducting paths 11, passing through the same in parallel paths and bringing the bank of spark gaps and thence to the ground.

Attention is here called to the fact that the intermediate strip 12 not only serves to space the plates 8 and 9 so as to maintain the curved terminals 24 of the conducting paths in proper relation to each other and to the pins 19, but also assist in preventing accidental displacement of the compound constituting the conducting paths and prevent said compound from scaling or disintegrating.

In Fig. 5 of the drawings there is illustrated a modified form of the invention especially designed for use in energized circuits having a lower voltage than that required for the arrester shown in Fig. 1 of the drawings. In this form of the device the insulating filler or spacing strip 12' terminates short of the lower ends of the plates 8' and 9' and is disposed in spaced relation to a metallic or carbon bar 27'' interposed between the lower ends of the plates, as shown. The lower bar 27'' and the upper distributing bar 14' are rigidly combined with the plates and supporting base by screws or similar fastening devices 28 similar to the fastening devices shown in Fig. 3 of the drawings, there being a binding post 29 depending from the bar 27'' for grounding the discharge from the conducting paths 11'. In this form of the device the static charge enters the binding post 30 where it is distributed by the bar 14' to the several conducting paths 11', the charge passing down these paths to the space 31 between the filling strip 12' and

bar 27'' where it leaks over the surface of the dielectric to the bar 27'', the resistance of each conducting path being such that no current at line voltage can flow across the space 31.

The clamping screws 30 of the several binding posts are each fitted with lock nuts 31 which keep the screws from working loose, from vibration or other causes, and thus securely hold the line and ground wires in position.

While I have described the principle of operation of the invention together with the apparatus which I now consider to be the best embodiment thereof I desire to have it understood that the construction shown is merely illustrated and that the invention may be carried out by other means.

Having thus described the invention what is claimed is:

1. A lightning arrester including a base, an insulating member secured to the base and having its face coated with a high resistance compound to form a bank of conducting paths disposed parallel with each other and provided with inclined terminals, a distributing bar extending transversely across the conducting paths at one end of the arrester, and a grounded terminal spaced from and co-acting with the inclined terminals of the conducting paths.

2. A lightning arrester including a base, spaced insulating elements secured to the base and having their lower edges inclined and their inner faces provided with a bank of high resistance conducting paths extending to the inclined edges of said insulating elements, an insulating spacing strip interposed between the insulating elements, a distributing bar connected with the conducting paths, a grounded terminal disposed beneath the insulating elements, and pins carried by the grounded terminal and disposed between the inclined edges of the insulating elements.

3. A lightning arrester including a base, spaced insulating elements secured to the base and having their adjacent faces inclined or beveled at the lower ends of the elements, said elements being provided with a plurality of high resistance conducting paths extending to and covering the inclined ends of the insulating elements, an insulating spacing strip interposed between the insulating elements, a bar disposed beneath the insulating elements and connected with the ground, and terminals carried by the bar and spaced from and disposed in alinement with the spacing strip to form a bank of air gaps, the conducting paths being disposed parallel with each other and arranged in series with the bank of air gaps.

4. A lightning arrester including a base, spaced insulating plates mounted on the base and each having its inner face coated with

a high resistance compound to form a plurality of conducting paths, an insulating spacing strip interposed between the plates and terminating short of the upper ends thereof to form a recess, a distributing bar seated in the recess and connected with the several conducting paths, and a grounded terminal coöperating with and spaced from the conducting paths.

5 5. A lightning arrester including a base, spaced insulating plates secured thereto and each provided with a plurality of high resistance conducting paths, an insulating strip interposed between the plates, a distributing

10 bar connected with the conducting paths, a grounded bar arranged beneath the insulat-

ing plates and having sockets formed therein, vertically adjustable pins seated in said sockets and spaced from the adjacent ends of the plates to form a bank of air gaps, the conducting paths being disposed parallel with each other and arranged in series with the air gaps, and means for locking the pins in adjusted position.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM GIFFORD.

Witnesses:

C. G. SHERWOOD,
LESLIE WAGLEY.