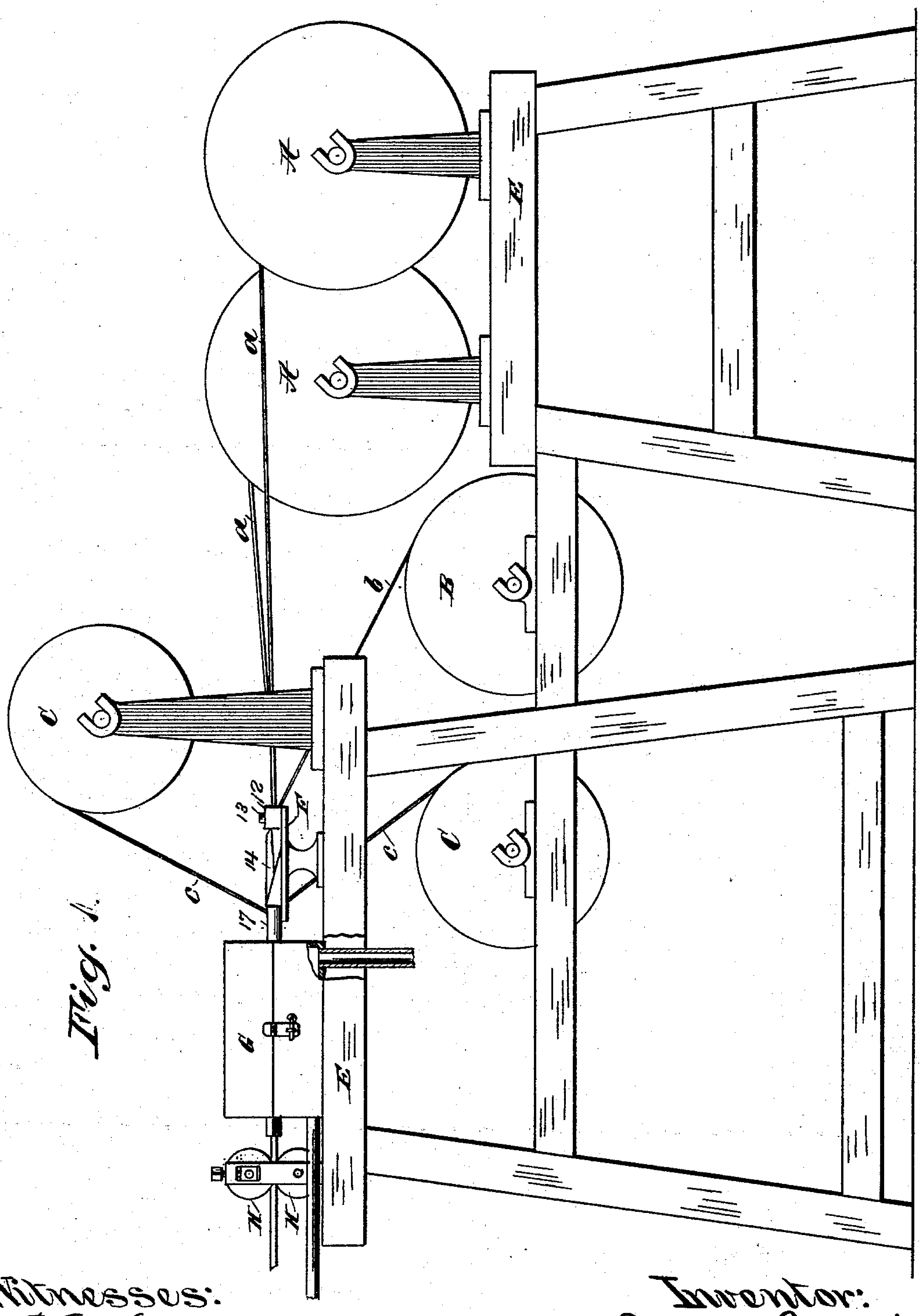
(No Model.)

3 Sheets—Sheet 1.

J. A. BARRETT.

MACHINE FOR COVERING WIRE.

No. 505,380. Patented Sept. 19, 1893.



Witnesses:
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Wm. H. Kennedy

Inventor:
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By Philipp Munson & Phelps
attys

(No Model.) 3 Sheets—Sheet 2.

J. A. BARRETT.

MACHINE FOR COVERING WIRE.

No. 505,380. Patented Sept. 19, 1893.

Fig. 2.

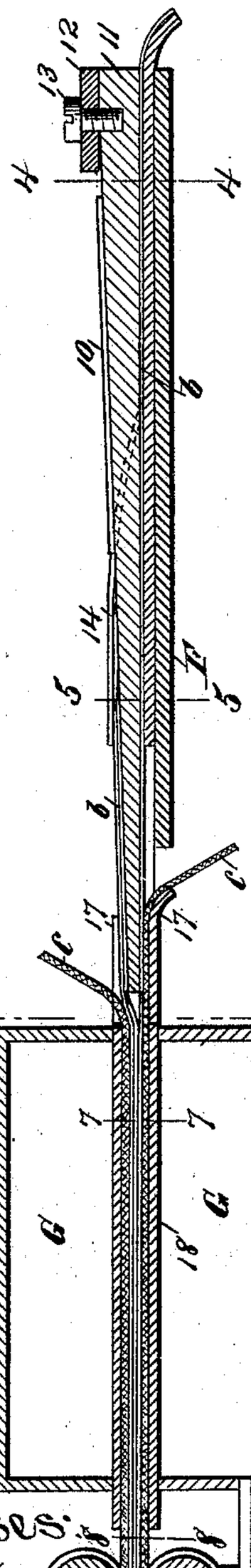


Fig. 3.

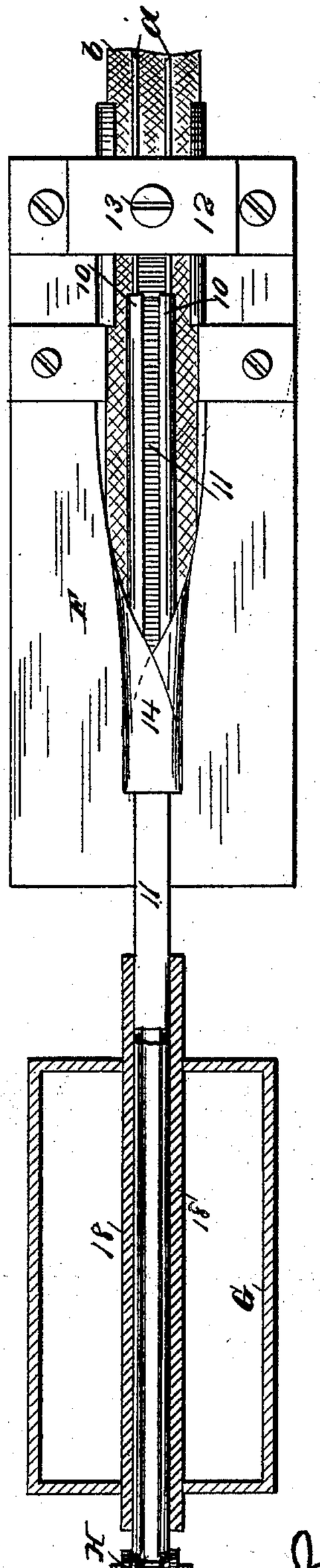


Fig. 6.

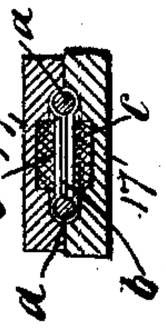


Fig. 5.

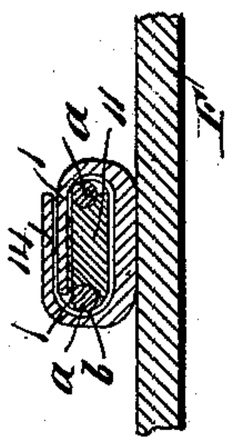
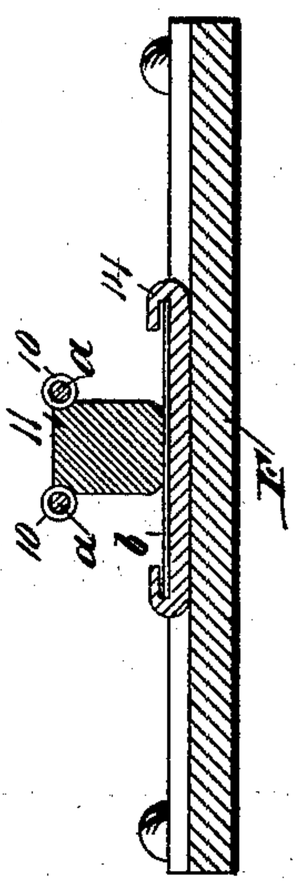


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

J. A. BARRETT.

MACHINE FOR COVERING WIRE.

No. 505,380. Patented Sept. 19, 1893.

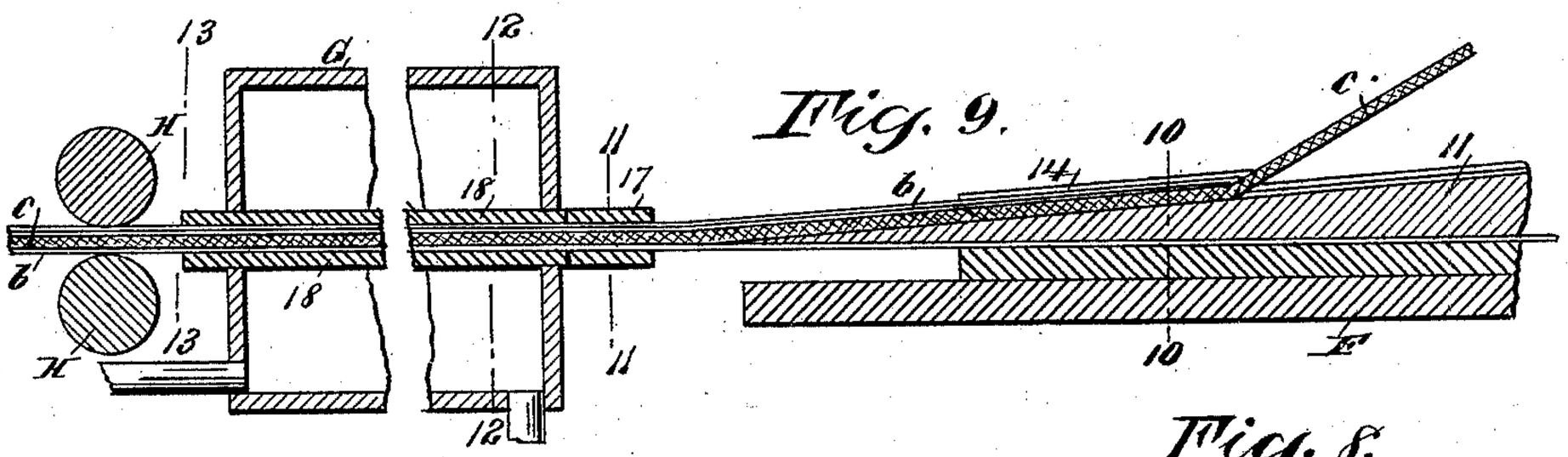


Fig. 9.

Fig. 8.

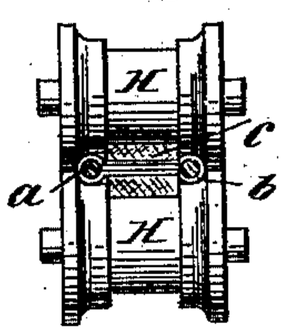
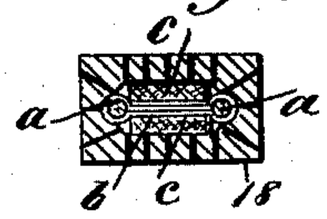


Fig. 7.



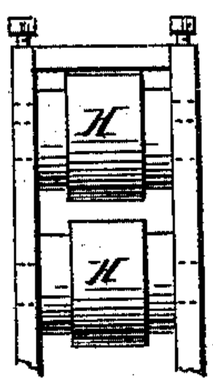


Fig. 13.

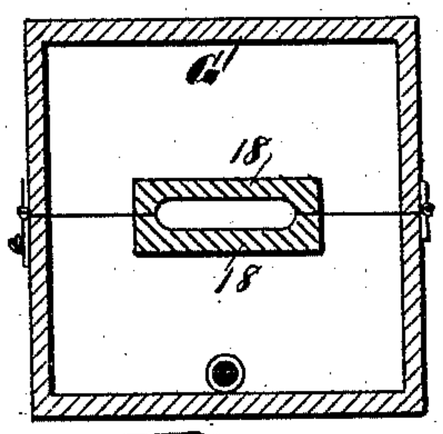


Fig. 12.

Fig. 10.

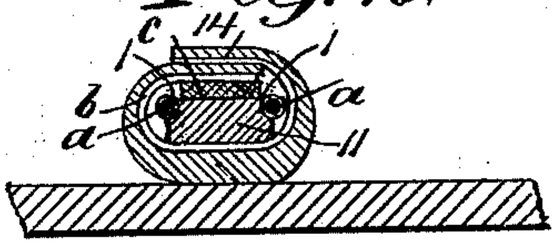


Fig. 11.

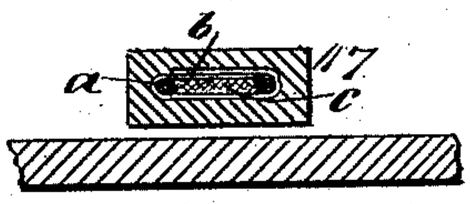


Fig. 14.

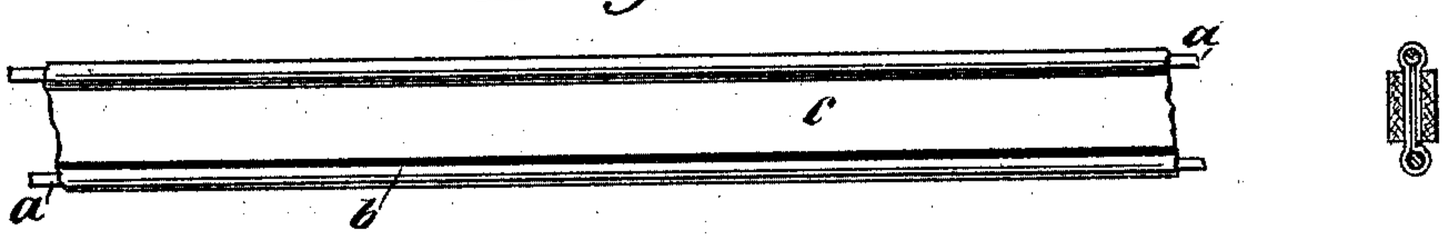
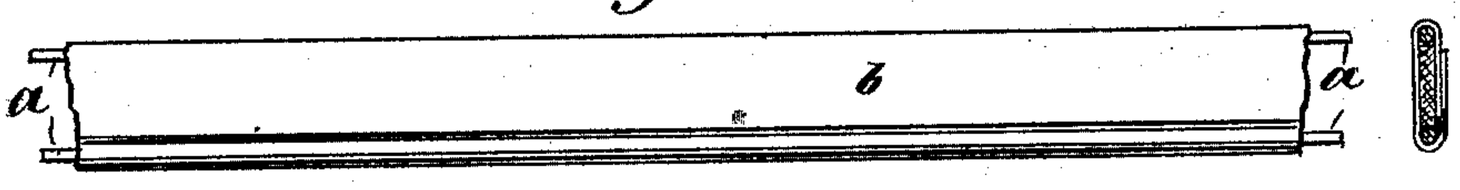


Fig. 15.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

JOHN A. BARRETT, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE STANDARD UNDERGROUND CABLE COMPANY, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR COVERING WIRE.

SPECIFICATION forming part of Letters Patent No. 505,380, dated September 19, 1893.

Application filed October 27, 1892. Serial No. 450,108. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. BARRETT, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Machines for Covering Wire, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide a simple, efficient and rapid machine for covering a plurality of separated electric conductors simultaneously in such a manner that the conductors are held rigidly at the required distance apart.

In my Patent No. 428,151, I have described and claimed an article termed therein an electric circuit consisting of a pair of conductors having a covering consisting of one or more strips of paper or similar insulating material wrapped about both conductors and secured together between the conductors by sewing or pasting to hold them in place, one or more binding strips separate from the wrapping being preferably applied between the conductors to stiffen the construction, such strip or strips being placed either outside or inside the wrapper.

The present invention has been made in connection with a machine devised for the purpose of making a pasted circuit of this class and the invention will be illustrated and described as embodied in such a machine, but it will be understood that the invention is applicable also in other machines and for covering wires for other purposes.

For a full understanding of my invention a detailed description of a machine for making electric circuits embodying the invention in its preferred form will now be given in connection with the accompanying drawings forming a part of this specification, and the features forming the invention specifically pointed out in the claims.

In the drawings:—Figure 1 is a side elevation of the machine. Fig. 2 is an enlarged horizontal central section of the devices for covering the conductors. Fig. 3 is a horizontal section taken above the circuit showing the folding devices in plan. Figs. 4, 5, 6, 7 and 8 are sections respectively on the lines 4, 5, 6, 7 and 8 of Fig. 2 looking to the left. Fig. 9 is a partial section similar to Fig. 2 showing a modification. Figs. 10, 11, 12 and 13 are cross sections on respectively the lines 10, 11, 12 and 13 of Fig. 9 looking to the left. Figs. 14 and 15 show the different products in plan and cross section.

Referring now particularly to Figs. 1 to 8, A, A are reels from which the conductors *a*, *a* to be covered are drawn, B the reel of the wrapper *b* of paper or other similar flexible material, and C the reels of the binding strips *c* of which two are used in the construction shown in these figures, these reels being placed upon opposite sides of the path of the conductors so that a binding strip is applied to each side of the wrapper between the conductors. The reels are supported in any suitable manner on the frame E of the machine, and upon the top of said frame are mounted also a table F carrying the devices for folding the wrapper about the conductors, the steam chest G for moistening the circuit covering and the feeding rolls H by which the parts of the circuit are pressed together and secured and the completed circuit advanced, thus drawing off the wires, wrapper and strips from their respective reels.

The conductors are guided and held at fixed distances apart as they are drawn forward and the wrapper folded about them, by tubular guides 10 carried by a tongue 11 supported from above by a bracket 12 on the table F. The tongue may be held rigidly in position, but this requires careful adjustment to avoid cramping the paper, and I prefer to support the tongue pivotally so as to permit it to swing vertically or horizontally to accommodate the paper wrapper which is rigidly guided after it leaves the tongue, and I have shown the tongue as supported in bracket 12 by a screw 13 arranged to permit the tongue to swing as required. Any other suitable pivotal connection may be used for this purpose. The tubular guides 10 extend forward to approximately the point where the wrapper is closed about the conductors and beyond this point the conductors are guided and held apart as positioned until the binding strips are applied, by grooves 1 in the sides of the tongue 11, the tongue being

made tapering so as to gradually decrease in thickness and bring the opposite layers of the wrapper together between the conductors as the wrapper is fed forward through the folder, until the binding strips are applied when the tongue ends. The wrapper *b* is led from the roll B into the machine below the tongue 11 and between it and the folder 14, which is formed of a plate secured to the table F and constructed to fold the edges of the wrapper gradually over the conductors *a* and the tongue 10, the wrapper being of sufficient width and the folder 14 constructed so that the edges of the wrapper are overlapped as the conductors and wrapper are fed forward and the wrapper drawn tightly about the tongue and conductors, which are then supported and held in position by the tongue between them, as previously described and as shown in Fig. 5, and the binding strips *c* are led in outside and on opposite sides of the wrapper as the wrapper and conductors pass the end of tongue 11.

The wrapper and binding strips are secured together by pasting and for this purpose any suitable means for rendering the wrapper or strips or both adhesive may be used, but I prefer to avoid the application of paste or gum in the machine and for this purpose I use previously gummed strips, preferably for both the wrapper and binding strips, and moisten these previously gummed strips in the machine.

Any suitable means for applying either water or steam to moisten the previously gummed strips may be used, but I prefer to use steam which will readily penetrate to and moisten the gummed portions of the wrapper and binding strips after they are brought in position as previously described, and for this purpose I have shown a simple construction which will be found convenient and efficient.

In the preferred construction shown, in which steam is used, a steam chest G is mounted upon the frame E, as previously described, and provided with suitable steam supply and exhaust pipes 15, 16, this steam chest being placed just in advance of the tongue 11.

The table F carries a guide 17 by which the strips *c* are directed into position above and below the wrapper, and the parts of the circuit brought together and held in position. From this guide 17 the circuit passes into the steam chest G and through a guide 18 extending longitudinally through the same, this guide 18 being perforated as shown so as to allow the steam to pass to the circuit for moistening the pasted portion while at the same time the parts of the circuit are held in position.

The steam chest G and guide 18 are preferably made in two parts by dividing horizontally, the chest being made hinged so as to open and the upper and lower parts of the guide 18 being carried respectively by the cover and body of the chest so that by opening the chest the guide also is opened.

It will be seen that the parts of the circuit are held in position pressed together lightly by the guide 18 in the steam chest G, and just in advance of the steam chest are located the feeding and pressing rolls H by which the parts of the circuit are pressed together more firmly, and the adhesive portions thus secured together.

The guide 18 and the rolls H are formed as shown in Figs. 7 and 8 so as to conform to the shape of the circuit with the strips *c* on the outside of the wrapper.

The operation of the construction will be understood from a brief description. The conductors *a*, wrapper *b* and binding strips *c* are all drawn from their reels and fed forward by the feeding and pressing rolls H. As the conductors and wrapper are fed forward, the conductors are held in position by the tubular guides 10 and grooves 1 on the tongue 11, and the wrapper *b* is folded about the conductors by the folder 14, the binding strips *c* being then fed in and the parts forced into proper position and held together by the guide 17 as they pass to the perforated guide 18 in steam chest G, and are then secured together by adhesion of the gummed portions under the pressure of the feeding and pressing rolls H. The circuit thus formed is shown full size in Fig. 14. From the rolls H, the circuit may be led to a drum and reeled up, or led to other mechanism. The circuit may be used flat or spiraled in an independent machine, or a suitable spiraling and reeling mechanism may be combined with the machine shown, receiving the circuit from the rolls H, so that the circuit is covered, spiraled and reeled ready for use in a single machine and continuously.

While I have shown and described binding strips as applied on both sides of the wrapper, and I prefer this construction, it is evident that one or both of the strips may be omitted. It is evident, also, that, instead of applying the binding strip or strips *c* outside the wrapper, one or more binding strips may be placed between the conductors before the wrapper is folded about them so as to be inclosed within the wrapper and in Figs. 9 to 13 I have shown details of such a modified form of machine, the other parts remaining substantially as shown in Figs. 1 to 8 and previously described. In this construction a single binding strip *c* is led inside the folder 14 just before it closes the edges of the wrapper *b* over the conductors the tongue 11 being grooved on the upper side as shown in Fig. 10 so as to permit the strip to be brought into position between the conductors and form a guide for the strip, and the tongue 11 terminates just after the strip has been brought into position as shown in Fig. 11, the wrapper being then pressed down upon the binding strip between the conductors by the guide 17. The circuit then passes through the guide 18 in the steam chest G and to the rolls

H as before, the construction of these parts remaining the same, except that they are changed in form to correspond with the circuit, as shown in Figs. 12 and 13. The circuit formed by this modified machine with the strip inside the wrapper is shown full sized in Fig. 15.

While I have shown a binding strip or strips as applied to the wrapper to stiffen the circuit, it is evident that the machine may be used to make circuits not thus stiffened, the binding strips being omitted. It is evident, also, that my invention is not limited to a machine for covering two conductors to form a single strand circuit, but may be embodied in a machine for covering any number of conductors simultaneously, and various modifications may be made in the construction shown without departing from my invention.

I do not claim herein the devices for folding the wrapper strip about the conductors and applying the binding strips thereto, as these are claimed in another application, Serial No. 426,869, filed March 29, 1892.

What I claim is—

1. The combination with a folder for folding a wrapper strip about a plurality of wires, of means for rendering the wrapper adhesive, and means for advancing said wires and wrapper with the wires held at a fixed distance apart and pressing the layers of wrapper together, substantially as described.

2. The combination with a folder for folding a wrapper strip about a plurality of wires, of guides by which one or more binding strips are applied between the wires, means for rendering the wrapper or binding strips adhesive, and means for advancing said wires and covering and pressing the adhesive wrapper and binding strip or strips together, substantially as described.

3. The combination with a folder for folding a previously gummed wrapper strip about a plurality of wires, of moistening devices for rendering the wrapper strip adhesive, and means for advancing said wires and wrapper with the wires held at a fixed distance apart and pressing the layers of wrapper together, substantially as described.

4. The combination with a folder for folding a previously gummed wrapper strip about a plurality of wires, of a steam chest through which the wires and wrapper are led, and means for advancing said wires and wrapper with the wires held at a fixed distance apart and pressing the layers of wrapper together, substantially as described.

5. The combination with a folder for folding a previously gummed wrapper strip about a plurality of wires, of a steam chest, a perforated guide in said steam chest through which the wires and wrapper are led, and means for advancing said wires and wrapper and pressing the layers of wrapper together, substantially as described.

6. The combination with a folder for folding a wrapper strip about a plurality of wires, of guides by which one or more binding strips are applied between the conductors, the wrapper or binding strips, or both, being previously gummed, a steam chest, a perforated guide in said steam chest through which the wires, wrapper and binding strips are led, and means for advancing the wires and covering and pressing the wrapper and binding strips together, substantially as described.

7. The combination with guides for holding wires at a fixed distance apart, of a folder for folding a wrapper strip about the wires, means for rendering the wrapper adhesive, and means for advancing the wires and wrapper and pressing the layers of wrapper together between the wires, substantially as described.

8. The combination with a tapering tongue forming a guide holding wires at a fixed distance apart, of a folder for folding a wrapper strip about the wires and tongue, a guide holding the parts in position after they have passed the tongue, means for rendering the wrapper adhesive, and means for advancing the wires and wrapper and pressing the layers of wrapper together between the wires, substantially as described.

9. The combination with a tapering tongue forming a guide holding wires at a fixed distance apart and extending to a point where one or more binding strips are applied between the wires, of a folder for folding a wrapper strip about the wires and tongue, a guide holding the parts in position after they have passed the tongue, means for rendering the wrapper or binding strip or strips adhesive, and means for advancing the wires and covering and pressing the layers of wrapper and binding strip or strips together between the wires, substantially as described.

10. The combination with a tapering tongue forming a guide holding wires at a fixed distance apart and extending to a point where one or more binding strips are applied between the wires, of a folder for folding a wrapper strip about the wires and tongue, the wrapper or binding strips, or both, being previously gummed, a steam chest, a perforated guide in said steam chest through which the wires, wrapper, and strips are led, and means for advancing the wires and covering and pressing together the wrapper and binding strips between the wires, substantially as described.

11. The combination with feeding devices for advancing a plurality of wires and a previously gummed wrapper strip inclosing said wires, of steam chest G, and perforated guide 18 in said chest, substantially as described.

12. The combination with feeding and pressing rolls H, of steam chest G, and perforated guide 18 in said chest, substantially as described.

13. The combination with feeding and pressing rolls H, of steam chest G, perforated guide 18 in said chest, tapering tongue 11, and folder

14 inclosing said tongue, substantially as described.

14. The combination with feeding and pressing rolls H, of steam chest G, perforated guide 18 in said chest, guide 17 constructed to form guides for one or more binding strips, tapering tongue 11, and folder 14 inclosing said tongue, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN A. BARRETT.

Witnesses:
MARGARET BARRETT,
JAMES BRADSHAW.