

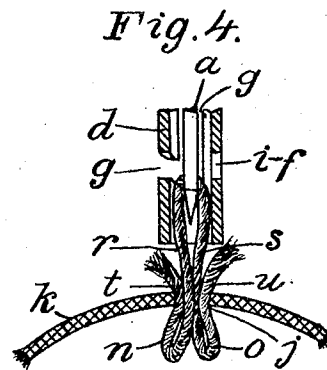
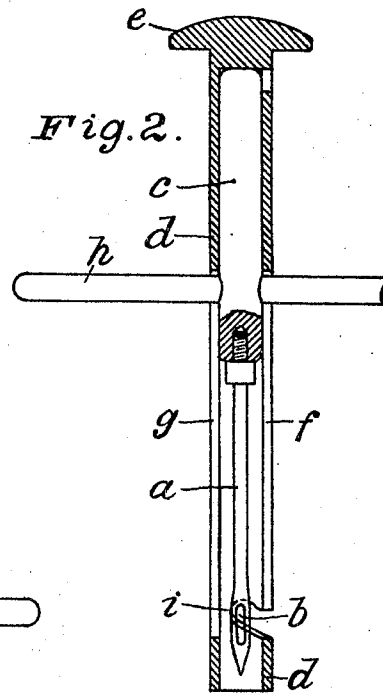
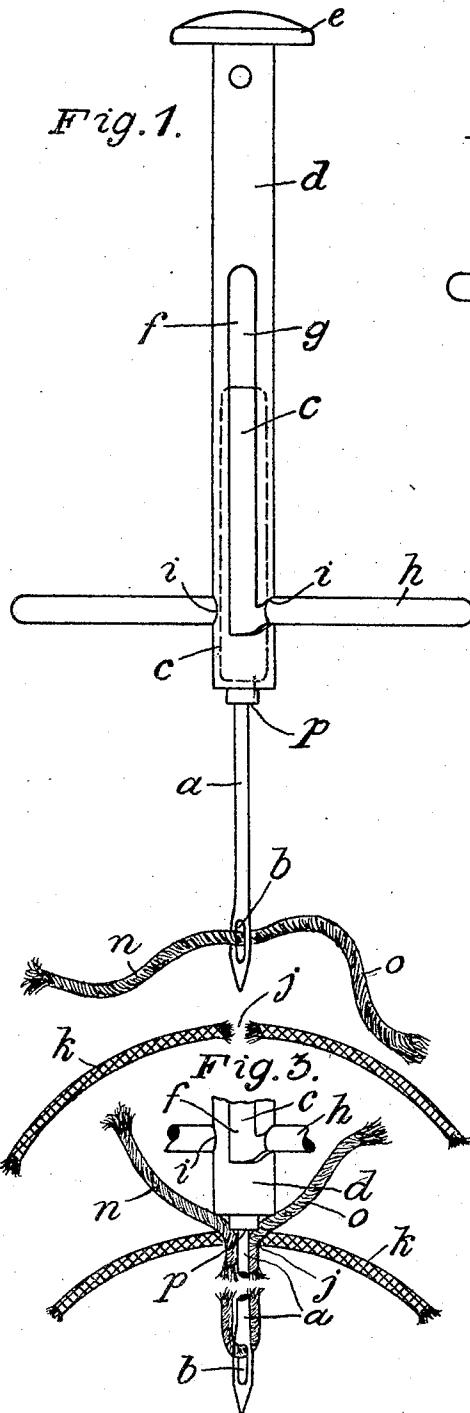
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TOOL FOR PLUGGING HOLES IN FLEXIBLE PIPES

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TOOL FOR PLUGGING HOLES IN FLEXIBLE PIPES.

Application filed June 28, 1926, Serial No. 119,170, and in Switzerland May 18, 1925.

This invention refers to a tool for plugging holes in flexible pipes, such as lengths of hose pipe for use in cases of fire.

The tool comprises:

5 A needle, the eye of which is adapted to receive a plugging piece of elongated shape, which is introduced into the hole, the needle drawing in the piece and forming it into a loop in the hole.

10 A guide into which the needle may slide, but in which it can be locked so that it can be introduced into the hole by acting on the whole tool.

A manipulating device permitting the 15 needle to be displaced with respect to the guide and for withdrawing it from the hole with the central portion of the plugging piece, so that this latter passes a second time into the hole, whilst the guide retains 20 the parts of the said piece already located in the hole in position.

25 The whole tool is so constructed that holes may be plugged without the risk of piercing the opposite wall of the pipe and so that there is satisfactory plugging from the start.

The annexed drawing shows by way of example one constructional embodiment of a tool intended for repairing flexible pipes 30 formed with a hempen sheath, of the type used for fire hose.

Fig. 1 is a front elevation.

35 Fig. 2 is a longitudinal section showing certain portions in a different position to that which they occupy in Fig. 1.

Figs. 3 to 5 refer to the method of employing a device constructed according to the said embodiment.

40 The tool comprises a metallic needle *a*, having near one of its extremities a long eye *b*, which is adapted for the reception of a wick or length of plugging material. This needle is screwed at the other extremity into a metallic slide *c*.

45 The slide *c* is located in a metallic sheath or holder *d*, open at one of its ends and closed at the other end by a knob or button *e*. This sheath or holder is provided with two opposite longitudinally extending slots *f* and *g*. These slots allow for the passage 50 of a cross bar *h* rigidly connected to the slide *c* and allowing for the operation of

this latter. *f* and *g* are lateral notches into which the cross bar can be inserted.

The device just described is used in the 55 following manner:

When it is desired to plug a hole *j* in the length of pipe *k*, the slide *c* is brought to the bottom of the sheath *d* and the transverse member *h* is inserted into the notches *i*. Then, a wick of obturating textile material, for instance a hempen wick free from glue, is threaded through the eye *b*, so that two ends *n* and *o* are left of sufficient length, 60 on either side of the eye, as shown at Fig. 3. Then the needle *a* is introduced into the hole *j* by pressing on the button *e*. It takes with it the ends *n* and *o* which come between the edges of the hole and the needle itself. The depth of insertion is limited because 70 the socket *p* for the needle and the base of the sheath *d* come against the two ends *n* and *o* and press them against the surface of the hose.

The cross piece is now rotated through 90° 75 to disengage it from the notches *i*, and is drawn up by the fingers pulling thereon from below, whilst the button *e* is pressed down with the palm of the hand, and the lower end of the sheath is kept in contact 80 with the ends *n* and *o*. The needle *a* moves upwards pulling with it the inner portions *r* and *s* of the ends *n* and *o*, which thus come between the outer portions *t* and *u* of these ends. 85

In this way, the hole *j* is plugged, as shown at Fig. 4.

The path of travel of the slide when withdrawn is limited because it comes into contact with the button *e*. 90

It is now only necessary to cut off the free extremities of the parts as shown at Fig. 5.

As the compression to which the parts *r*, *s*, *t*, *u* are exposed in the hole *j* is considerable, the said hole is well plugged from the start. Under the action of the water circulating in the pipe the parts swell up and produce still more perfect plugging. 95

It will be understood from what precedes that the plugging of a hole may be rapidly and easily effected without the risk of piercing the portion of the pipe opposite to the hole and without the risk of with- 100

drawing the whole of the plugging wick when the needle is withdrawn from the hole. The operation may be effected even when the length of hose is full of water under pressure.

As the needle *a* is removable from the slide *c*, needles of different sizes may be employed, according to the diameter of the hole to be plugged and the diameter of the length of hose to be treated.

The tool may be employed for plugging holes in any kind of flexible tubing.

It is to be noted that in order to plug holes in flexible pipes it has already been proposed to proceed in the following manner. A needle has been introduced into the hole to be plugged, into a recess or hole in which needle has been threaded a wick of obturating material, such for instance as hemp, so that two ends of sufficient length are left on either side of the hole. The needle is then cautiously withdrawn, so as to leave the two end portions of the wick in the hole, which is thus plugged by the two parallel portions which swell up under the action of moisture, and so plug the hole in a more efficient manner.

The foregoing method of procedure involves two drawbacks:

The introduction of the needle into the hole requires a considerable amount of force, the consequence being that the needle is sometimes inserted too violently and the wall opposite to the hole is perforated. The plugging is moreover not satisfactory from the commencement.

These drawbacks are obviated by employing the described tool as clearly results from the foregoing description.

I claim:

1. In a tool for plugging holes in flexible pipes the combination with a needle provided with an eye for receiving a plugging piece of elongated shape and which is adapted to be introduced into the hole to be plugged, the needle drawing in the piece and forming it into a loop in the hole, of a guide within which the needle may move, means including a manipulating device for locking said needle with respect to the guide in order that the needle can be introduced into the hole by acting on the whole tool, said manipulating device being adapted to displace the needle with respect to the guide and for withdrawing it from the hole with the central portion of the plugging piece in order that the latter can pass a second time into the hole whilst the guide retains the parts of said piece already located in the hole in position.

2. In a tool for plugging holes in flexible pipes the combination with a needle provided with an eye for receiving a plugging piece of elongated shape and which is adapted to be introduced into the hole to be

plugged, the needle drawing in the piece and forming it into a loop in the hole, of a guide within which the needle may move, means including a manipulating device for locking said needle with respect to the guide in order that the needle can be introduced into the hole by acting on the whole tool, of an element sliding in the guide and in which said needle is removably mounted, said manipulating device being adapted to displace the needle with respect to the guide and for withdrawing it from the hole with the central portion of the plugging piece in order that the latter can pass a second time into the hole whilst the guide retains parts of said piece already located in the hole in position.

3. In a tool for plugging holes in flexible pipes the combination with a needle provided with an eye for receiving a plugging piece of elongated shape and which is adapted to be introduced into the hole to be plugged, the needle drawing in the piece and forming it into a loop in the hole, of a guide within which the needle may move and which is constituted by a sheath provided with two longitudinally extending slots, a manipulating device for displacing the needle with respect to the guide and for withdrawing it from the hole with the central portion of the plugging piece and comprising a transverse bar going through the slots of the sheath in order that said central portion can pass a second time into the hole whilst the guide retains the parts of said piece already located in the hole in position.

4. In a tool for plugging holes in flexible pipes the combination with a needle provided with an eye for receiving a plugging piece of elongated shape and which is adapted to be introduced into the hole to be plugged, the needle drawing in the piece and forming it into a loop in the hole, of a guide within which the needle may move and which is constituted by a sheath provided with two longitudinally extending slots presenting notches a manipulating device for displacing the needle with respect to the guide and for withdrawing it from the hole with the central portion of the plugging piece and comprising a transverse bar going through the slots of the sheath and which may be located within the notches of the sheath by turning the needle round its axis for locking said needle in position with respect to the guide in order that said central portion can pass a second time into the hole whilst the guide retains the parts of said piece already located in the hole in position.

5. In a tool for plugging holes in flexible pipes the combination with a needle provided with an eye for receiving a plugging piece of elongated shape and which is adapted to be introduced into the hole to be

plugged, the needle drawing in the piece and forming it into a loop in the hole, of a guide within which the needle may move and which is constituted by a sheath, means including a manipulating device for locking 5 said needle with respect to the guide in order that the needle can be introduced into the hole by acting on the whole tool, an element sliding in the guide and in which the needle 10 is mounted, a bottom of the sheath serving as abutment for the sliding element, said manipulating device being adapted to displace the needle with respect to the guide and for withdrawing it from the hole with the central portion of the plugging piece in 15 order that the latter can pass a second time into the hole whilst the guide retains the parts of said piece already located in the hole in position.

In testimony whereof I affix my signature.

FRÉDÉRIC STAUFFER.