

No. 768,225.

PATENTED AUG. 23, 1904.

W. G. HARTLEY.

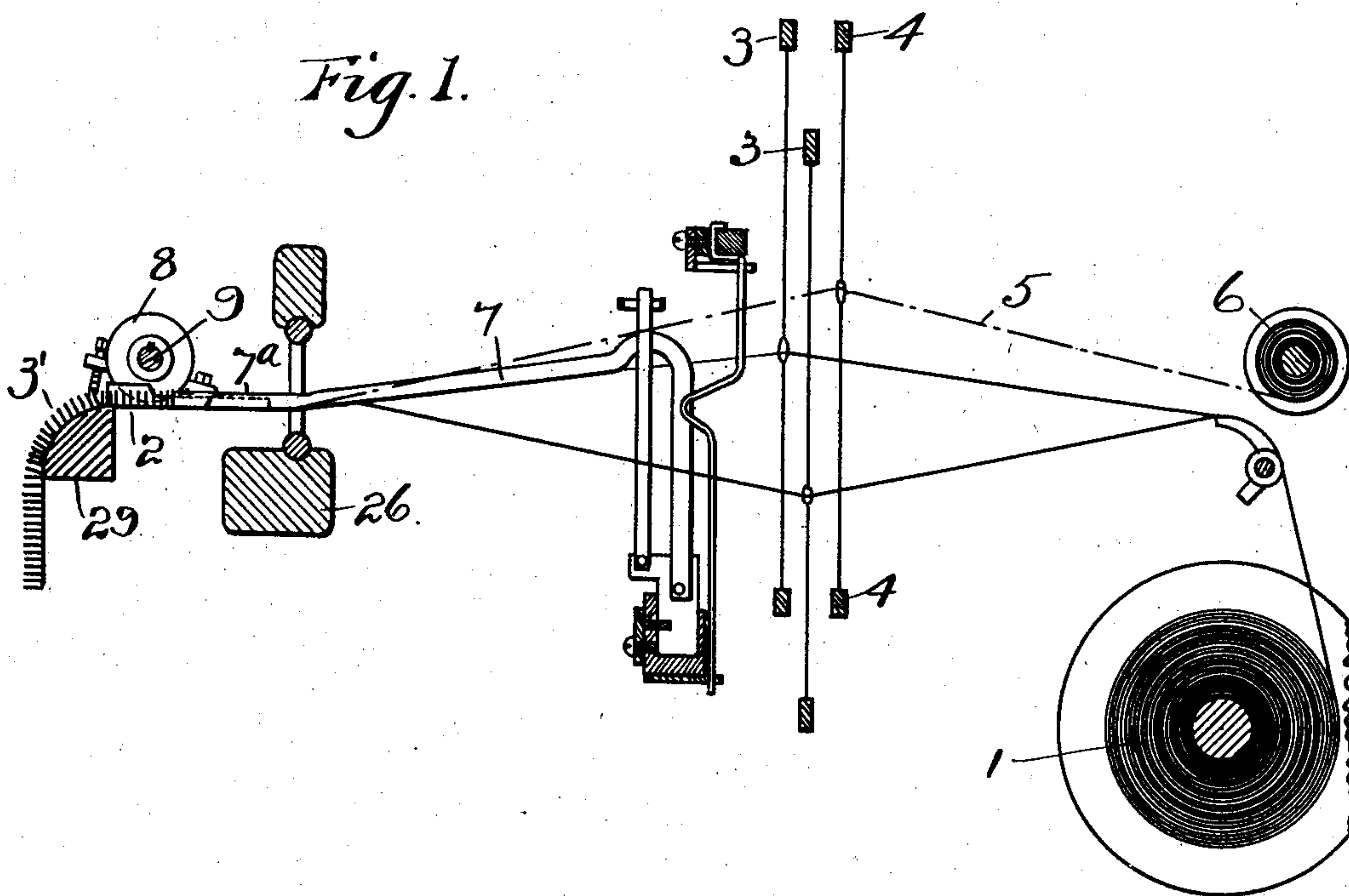
MECHANISM FOR CUTTING LOOPS OF PILE FABRICS.

APPLICATION FILED FEB. 6, 1904.

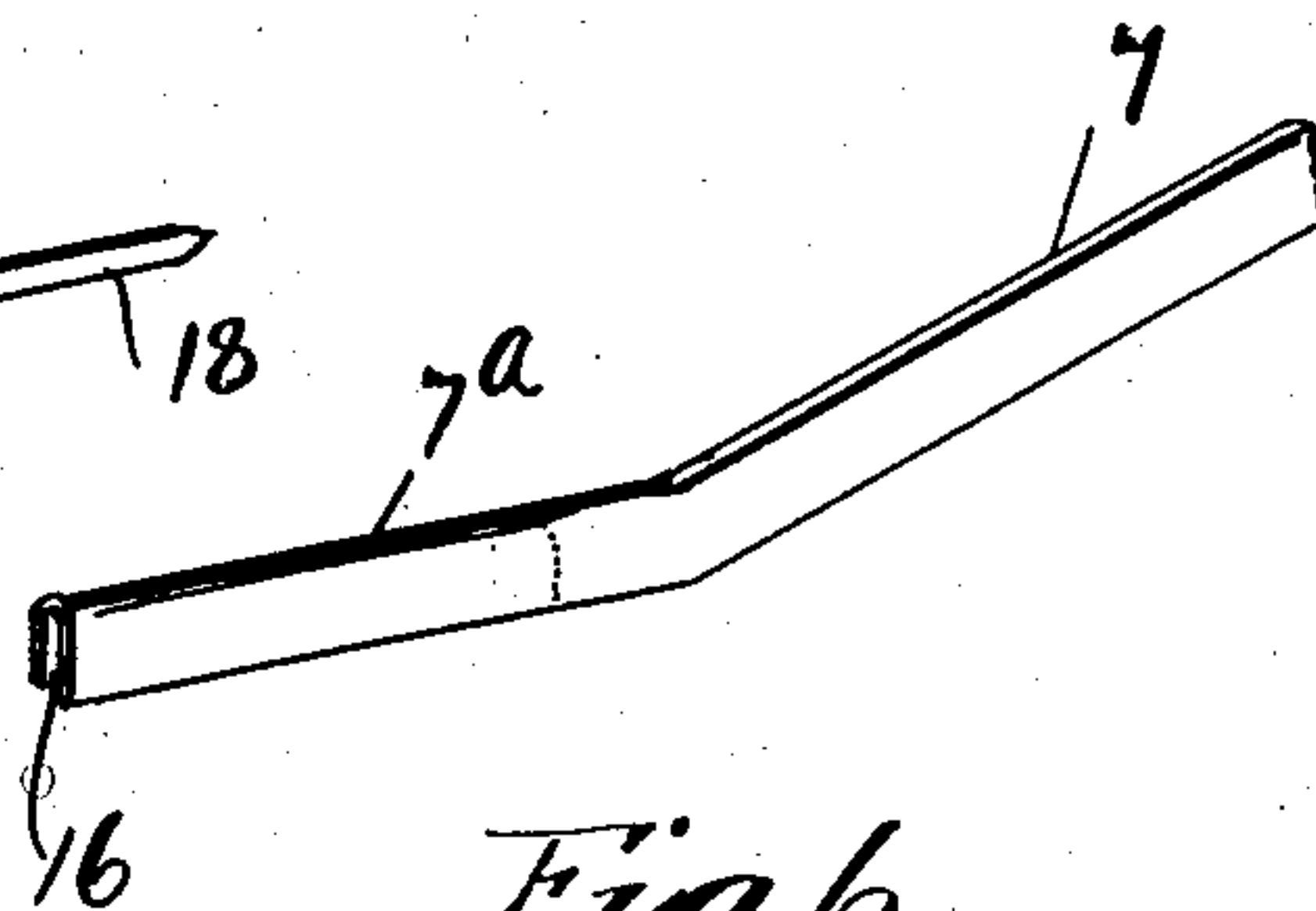
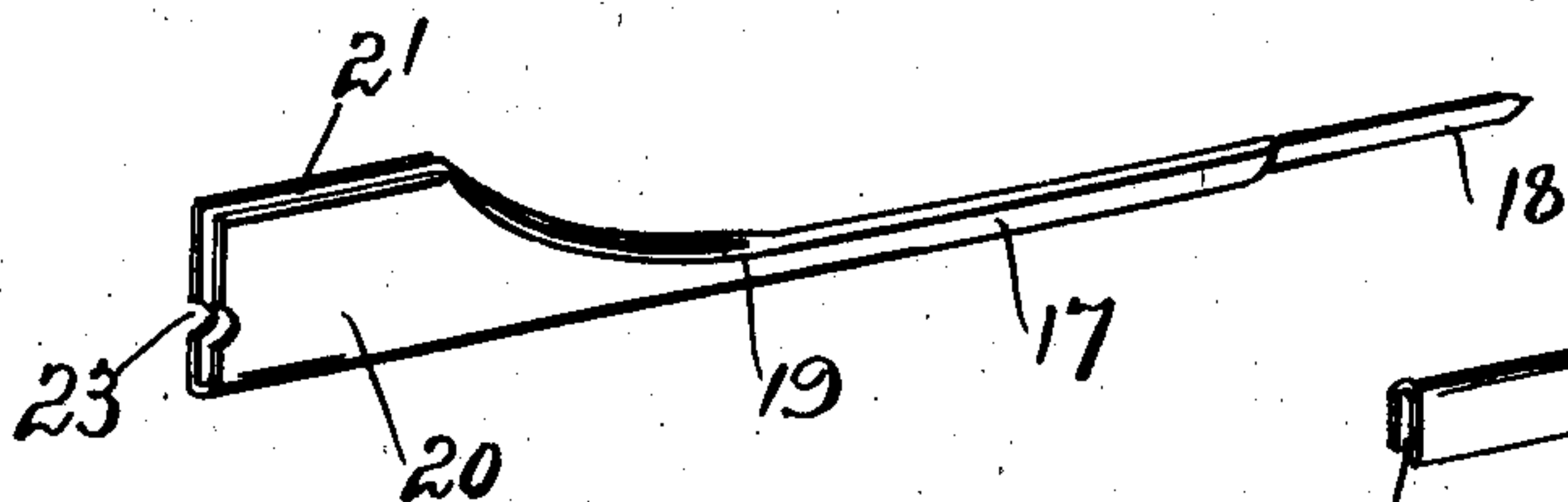
NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 5.*



*Fig. 6.*

Witnesses

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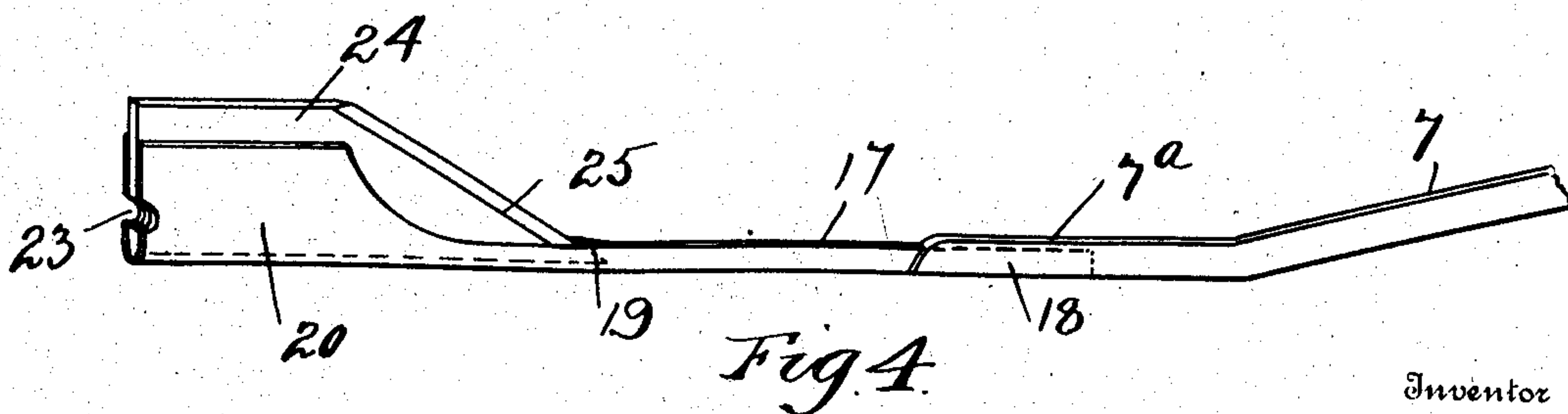
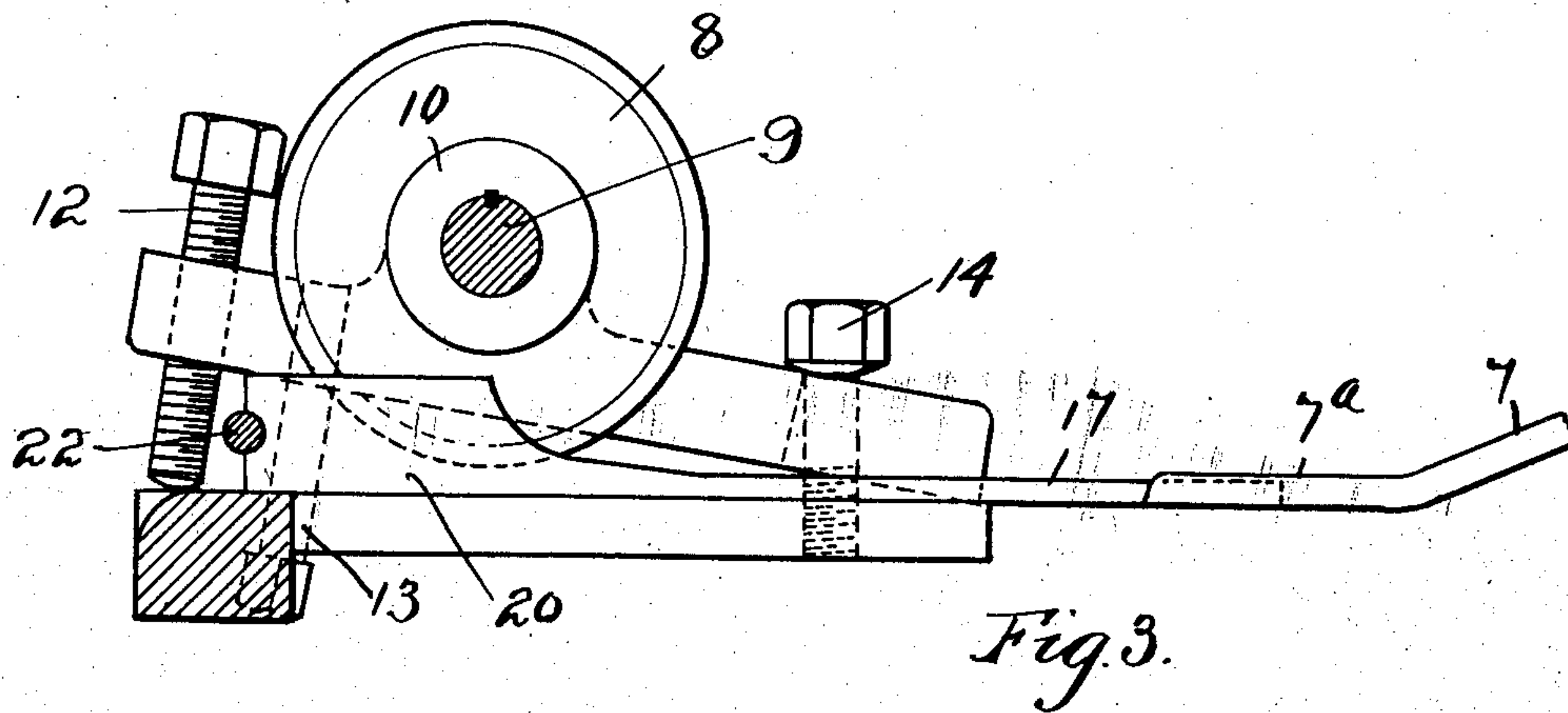
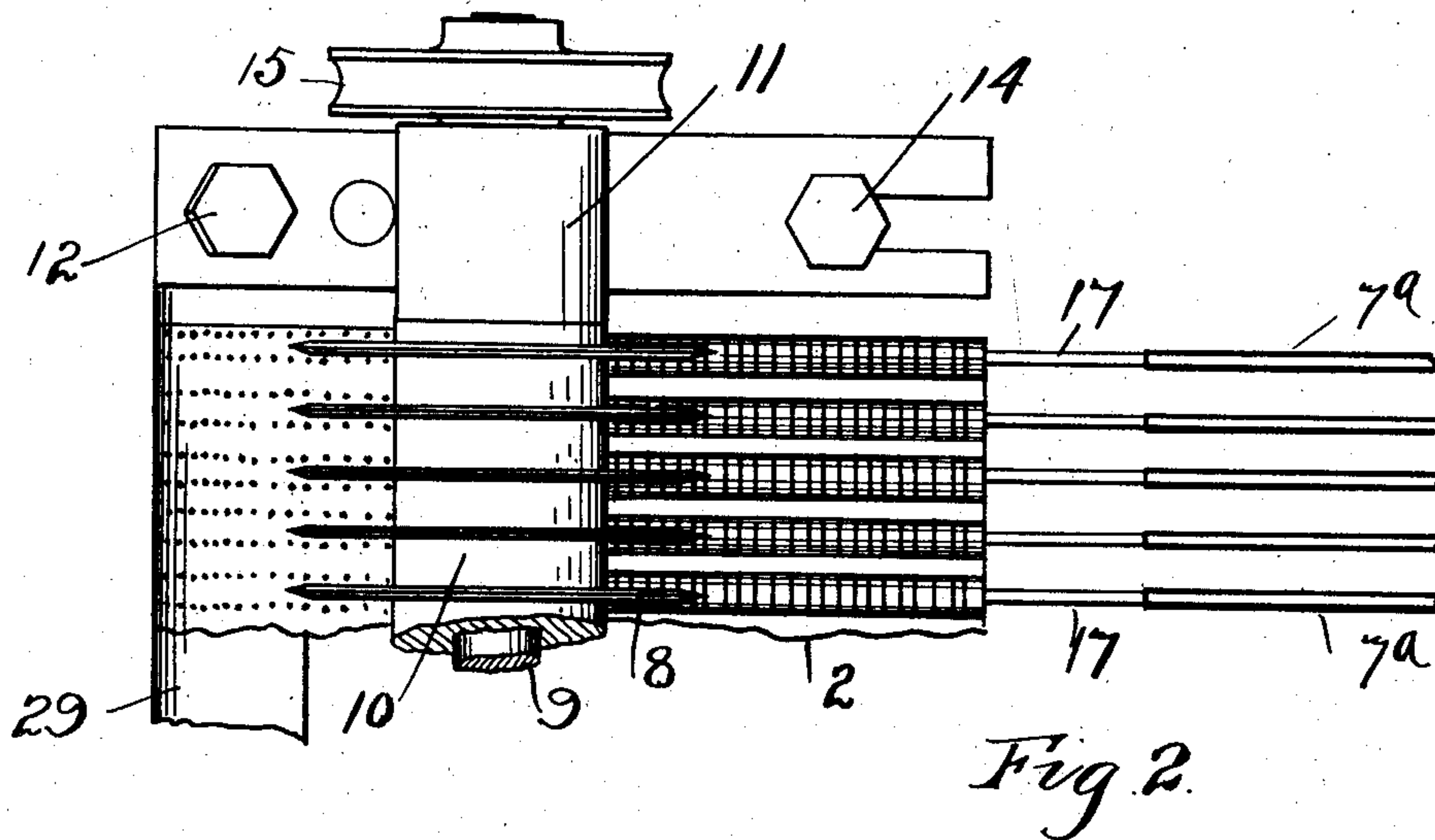
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## MECHANISM FOR CUTTING LOOPS OF PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 768,225, dated August 23, 1904.

Application filed February 6, 1904. Serial No. 192,414. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. HARTLEY, a resident of Amesbury, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Mechanism for Cutting Loops of Pile Fabric; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to improvements in means for cutting the loops formed by the pile-threads in pile fabric, the principal object of the invention being to construct a continuous guide whereby the loops when formed over the pile-wire will be retained and guided by a guide-bar continuously from the end of said pile-wires to the cutters.

A further object of the invention is to support each pile-cutter in a case or shoe, which shoe is of a form designed to draw the top of the loops tightly across its face as they advance on the woven fabric. As this fabric is drawn forward the loops in this tightly-drawn condition are presented to the sharp edge of the cutter, which cutter readily severs them, and the severed threads pass by on either side of the shoe, forming what is known as a "velvet" or "plush" surface on the fabric.

The invention consists of other novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the appended claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 illustrates a rotary cutter in position to cut the loops on the woven pile fabric as said loops are being drawn forward over the breast-beam, the view being a diagram in section, showing parts of the loom and the relative position of the new device to the usual parts looking in the direction of one end of the loom. Fig. 2 is an enlarged plan view showing a number of the rotary cutters mount-

ed on an arbor and in position to sever the pile-threads as they are guided to them. Fig. 3 is a side elevation representing the rotary cutter as it revolves within the shoe, also showing means for adjusting said cutter vertically. Fig. 4 represents the end of the pile-wire and the guide-bar for receiving and guiding the loops to the cutter, the cutter in this view being represented as a stationary knife. Fig. 5 is a perspective view representing in detail the shoe or case in which the cutter sets and also the extension which connects it with the end of the pile-wire. Fig. 6 is a perspective view showing the loop-forming end of the pile-wire, showing it as being recessed on its under side to receive the end of the extension on the cutter-shoe.

Referring to the drawings, 1 in Fig. 1 is the usual yarn-beam that carries the warp-threads from which the ground fabric 2 is woven. On this ground fabric are formed the pile-loops 3', which when cut produce the velvet or plush effect such as form the face of carpeting or other pile fabric.

At 3 3 are the heddles or harnesses that control the ground warp-threads, and 4 is the heddle that controls the vertically-reciprocating movement of the pile-threads 5, these latter threads being led from the spool 6 on the rear of the loom.

At 7 is the pile-wire, one end, 7<sup>a</sup>, of which lies on the woven fabric 2, such end being drawn down to the size of the loops desired to be formed over it. These loops are formed over the pile-wires at each pick of the loom and beat up in place by the reciprocating lay 26, and by a sequence of motions they are repeatedly made and drawn forward off of said wires over the guides, hereinafter described, to the cutters 8, where they are severed, the fabric continuing forward over the breast-beam 29 to the take-up roll below. (Not shown.)

Any number of flattened wires 7 and corresponding pile-threads 5 may be used, and any number of harnesses or shuttles may be employed, according to the style of goods desired. Only enough of the loom is shown to illustrate the operation of my invention.



At 8 is a thin steel disk sharpened to a knife-edge on its periphery. A series of these disks (one to each row of pile-loops) are mounted on a shaft 9, to which shaft they are keyed. (See Fig. 2.) Collars 10 are placed between the cutters to separate them the proper distance to correspond with the rows of pile-loops. This shaft 9, with the cutters mounted thereon, is journaled in bearings 11 at each end of the loom. These bearings, as illustrated in Fig. 3, are made adjustable, so that the cutters may be set in the required position either forward or back and at the desired elevation, the latter adjustment being accomplished by the screws 12 and 13, the opposite end of the bearing being held by the screw 14.

At 15 is the driving-pulley mounted on the cutter-shaft 9, which receives its motion from a belt driven from any convenient means.

The underside of the front end 7<sup>a</sup> of the pile-wire 7 that lies on the woven fabric is slotted or cut out at 16 (see Fig. 6) to receive the end of the guide-bar 17, which end is drawn down at 18 to be inserted in said slot. The bar 17 extends toward the front of the loom, where it widens out at 19 for the purpose of spreading and tightening the loops as they are drawn forward over it by the moving of the fabric toward the rapidly-revolving knives to be severed as fast as woven. By tightening the loops before they are presented to the knife the threads are severed much easier and smoother and more satisfactory results obtained. The outer end of the bar has comparatively high sides at 20, such end being slotted at 21, forming a shoe or shell, between the walls of which the circular cutter 9 revolves. The front end of this shoe is held down in position by the bar 22, which bar engages the slot 23 in the outer end of each shoe and extends across the front of the loom just above the woven fabric and is fastened at each end.

I have previously described the loops as being cut by a rotary cutter; but in Fig. 4 I have shown a thin blade of steel 24, which may serve the same purpose. The cutting edge 25 of this blade is made on an angle, the thin piece of metal being set into the slotted end of the shoe, where it is held in position by any suitable means. This latter means of using the fixed blade for cutting the loops is a much simpler method; but the results are not always as satisfactory as that obtained by the rotary cutters and the blades cannot be used on some classes of goods. In considering the construction of this shoe I do not wish to confine myself to the exact arrangement shown, as the guide-bar 17 of the shoe may be made integral with the pile-wire, or the end of said pile-wire itself may be extended out toward the front of the loom and have the cutter mounted in the end thereof, if desired.

The advantage of guiding each loop of the pile continuously to the cutters from the point where it is formed over the pile-wire is

obvious, as it gives no possible chance for a single loop to get by the cutters without being severed. Hence perfect work is assured.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, a cutter, a pile-wire provided at one end with a slot or recess, a guide-bar fitted at one end to loosely engage the slot in said pile-wire, whereby these engaging ends are free to rise and fall with the movement of the woven fabric, and means at the opposite end of said bar for supporting or guiding said cutter.

2. In a device of the character described, a cutter, a pile-wire provided at one end with a slot or recess, an independent guide-bar arranged at one end to adjustably engage the slot in the end of said pile-wire, the opposite end of said bar being bent or arranged to form a guide or support for said cutter.

3. In a device of the character described, a cutter, a pile-wire, one end of said pile-wire being grooved or scored out from beneath leaving a smooth upper surface over which to slide the pile-loops, a guide-bar fitted at one end to loosely engage the groove in said pile-wire and means in the opposite end of said bar for supporting or guiding said cutter.

4. In a device of the character described, a cutter, a pile-wire, one end of said pile-wire being grooved or scored out from beneath leaving a smooth upper surface over which to slide the pile-loops, an extension guide-bar drawn to a thin blade at one end for the purpose of loosely engaging the grooved end of said pile-wire and means at the opposite end of said bar for supporting or guiding said cutter.

5. In a device of the character described, a pile-wire over which loops are formed by the pile-thread, one end of said pile-wire being provided with a slot, cutters for severing the loops, and a guide-bar one end of which is arranged to be inserted and loosely held in the slotted end of said pile-wire to serve as a continuous guide for the loops from said pile-wire to the cutters.

6. In a device of the character described, a pile-wire over which the loops are formed by the pile-thread, one end of said pile-wire being provided with a slot, cutters for severing the loops, means for adjusting said cutters, a guide-bar one end of which is arranged to be inserted and held loosely in the slotted end of said pile-wire, the opposite end of said guide-bar being arranged to guide or support the cutter, and means on said bar for automatically tightening the loops as they are drawn over said guide-bar to be severed.

In testimony whereof I have hereunto set my hand this 4th day of February, A. D. 1904.

WILLIAM G. HARTLEY:

In presence of—

ROBERT C. CLARK,  
DELL W. DOLBIER.