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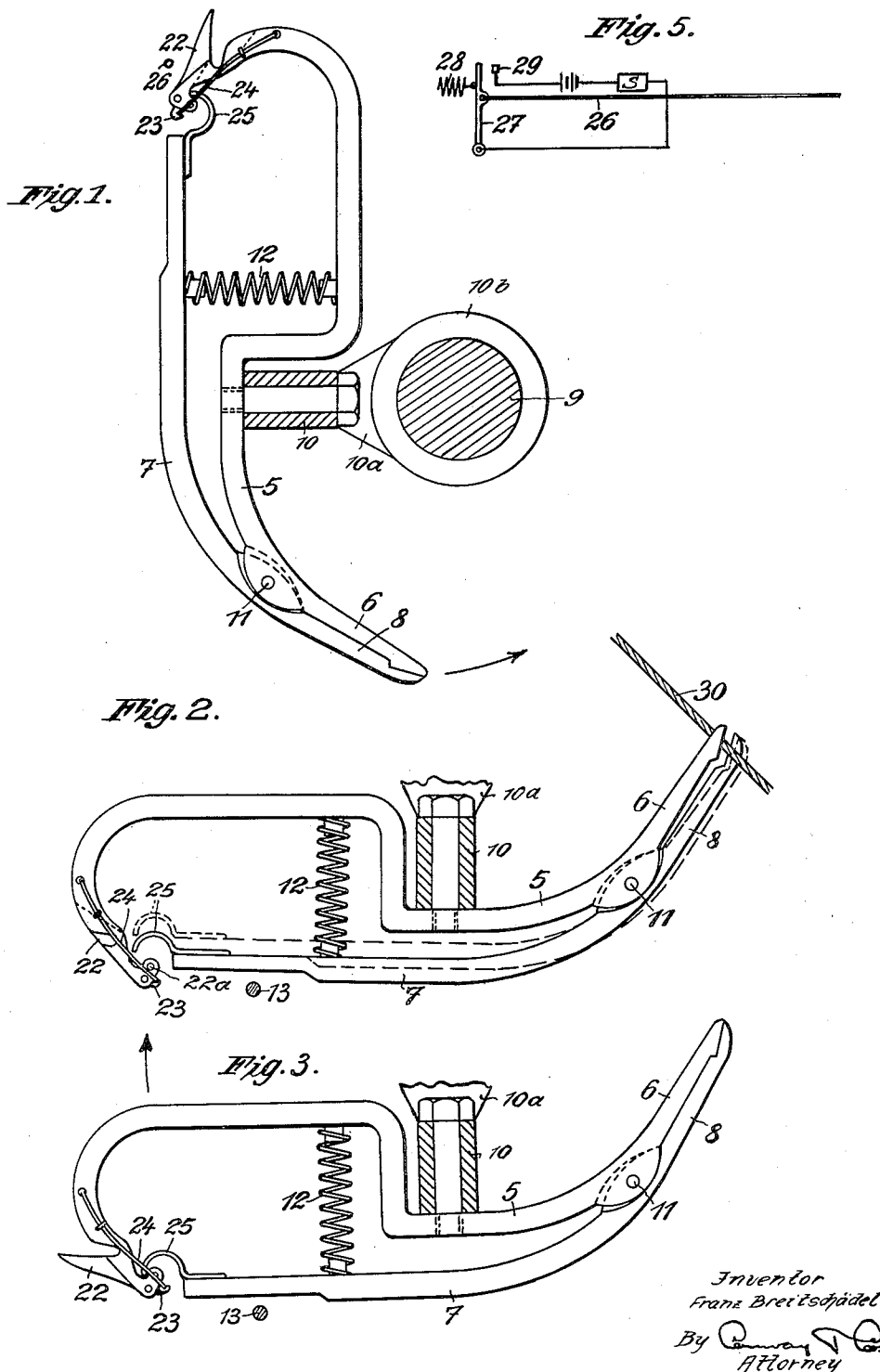
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APPARATUS FOR INDICATING FAULTY GRIPS WITH THREAD GRIPPING PLIERS

Filed Aug. 31, 1931

2 Sheets-Sheet 1



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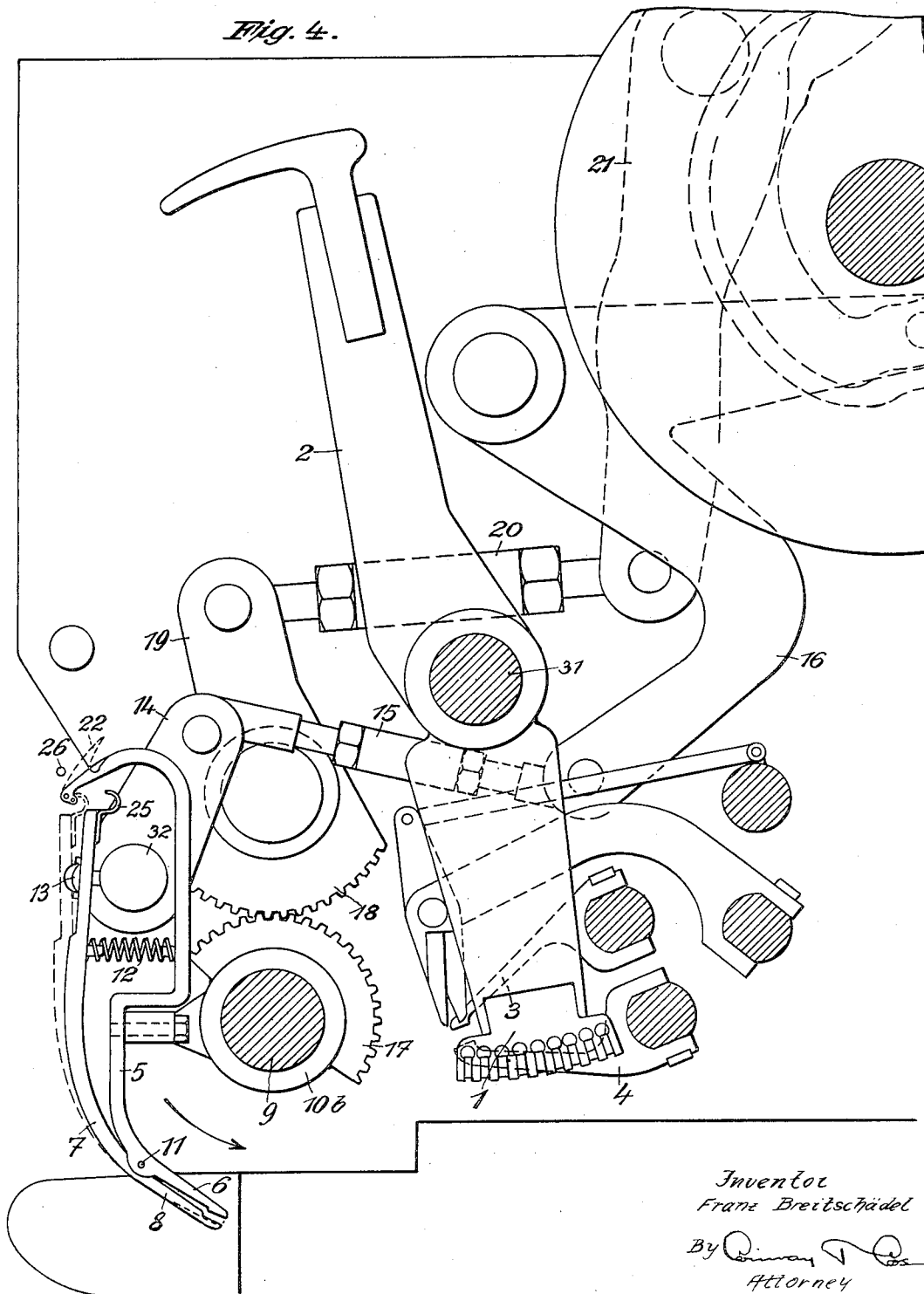
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Fig. 4.



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APPARATUS FOR INDICATING FAULTY
GRIPS WITH THREAD GRIPPING PLIERSFranz Breitschädel, Katscher, Germany, assignor
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7 Claims. (Cl. 139—9)

In working with thread gripping pliers which are used in various ways in carpet weaving and knotting machines, it often occurs that such pliers for some reason miss the thread to be gripped, and cannot therefore introduce it in the desired manner into the fabric. Faults in the fabric are thereby produced which in particular when frequently repeated can only be repaired at considerable expense.

In order to call the attention in due course of the worker attending to the loom or knotting machine, to such faults, according to the present invention the gripping pliers are provided with a device which causes the machine to be stopped or an optical or acoustical signal to be actuated, so that the fault in question can be immediately remedied.

The essence of the invention consists in that the slightly tighter closing of the jaws of the pliers caused by the failure to grip the thread produces a sufficiently large movement of a lever, by which latter is initiated the stopping of the machine or the release of a signal.

The invention is shown as an example in the drawings in which:

Fig. 1 shows the knotting pincers or pliers closed in the vertical position.

Fig. 2 shows the knotting pincers in the horizontal position with knotting thread seized.

Fig. 3 shows the knotting pincers in the horizontal position without knotting thread (knotting fault).

Fig. 4 is a side-view of a certain arrangement and combination of parts pertaining to a knotting loom, the knotting pliers or pincers forming parts of that arrangement and combination and being shown in the same position of its members as in Fig. 2, and the shafts and axes being shown in transverse section; and

Fig. 5 is a side view, partially-diagrammatic, of an auxiliary mechanism which is described below.

The pliers-carrier 10 (Figs. 1-3) which runs crossways to the loom is attached to an axis 9 by arms 10^a and collars 10^b and is rotatable upon said axis; it is driven by separate machine parts which will be described in connection with Fig. 4, and describes round the said axis an arc-shaped backward and forward movement; it carries, distributed over its whole length, the pliers or pincers (5, 6, 7, 8; Figs. 1-4) which serve to grip the thread ends to be knotted and to draw them into the fabric. Besides the pliers or pincers 5, 6, 7, 8, there are pliers or pincers 3 and 4 (Fig. 4) which

need not be dealt with in detail, because they do not form parts of this invention.

Each pincer 5, 6, 7, 8 consists of a part 5-6 firmly fixed on the pincer carrier 10, and the movable part 7-8 hinged thereto at 11. Both pincer parts represent double-armed levers with the point of rotation 11, the short limbs 6 and 8 of which form the actual pincer jaw serving to grip the knot thread ends. The closing of the pincer jaw takes place through the pressure of a spring 12, which forces the upper pincer limbs 5 and 7 apart, and thus presses the lower limbs 6 and 8 together. The opening of the pincers for the purpose of seizing a thread end takes place by means of the pressing member 13 (Figs. 2 and 3) running crossways to the machine, and which at the proper moment presses on the limb 7 when the jaw part 8 moves away from the jaw part 6, as shown dotted in Figs. 2 and 4.

The pressing member 13 is held in proper position by an axle 32 (Fig. 4), to which is fixed an arm 14 connected by a rod 15 with a bell-crank lever 16 rocked by a cam disk shown in dotted lines. The cam disks are, of course, so shaped that the movements of the operating members concerned are properly timed.

The collars 10^b are connected, or made integral, with a toothed segment 17 (Fig. 4) meshing with another toothed segment 18 forming one end of a double-armed lever 19 connected by a rod 20 with another double-armed lever 21 which is turned in certain suitable intervals by a cam-disk shown only in dotted lines. In Figs. 1 and 4 the pincers 5, 6, 7, 8 are shown in their vertical position of rest and in Figs. 2 and 3 they are shown in their horizontal operative position; they are turned from the first position into the other by means of the cam disk and the transmitting members 21, 20, 19, 18 and 17.

The limb 5 carries on its bow-shaped end rotatable about a pin 22^a (Fig. 2) a light finger-shaped catch lever or pawl 22 on the nose 23 of which acts a weak spring 24. The spring 24 tends to keep the catch lever 22 in the position shown in Fig. 2, in which the catch pawl 22 lies inside the limb 5.

The limb 7 of the movable pincer part carries at its end a key shaped projection 25 which is so adjusted that when there is a thread between the pincer jaws, it almost touches with its end the pawl 22 directly above its point of rotation 22^a (Fig. 2).

Across the machine, in front of the upper ends of the pincers 5, 6, 7, 8 being in the posi-

tion of rest extends a horizontal wire 26 (Figs. 1, 4 and 5). One end of the wire 26 is affixed to a suitable stationary part of the machine and the other end is connected with a movable arm 27 (Fig. 5) which is subjected to the pull of a helical tensile spring 28 holding the arm 27 which is a contact arm normally remote from a stationary contact 29. The contact 29 and arm 27 are arranged in a circuit which includes a signalling or stopping device S which is operated upon the closing of the circuit when arm 27 engages contact 29.

On the shaft 31 (Fig. 4) is located a double-armed lever 1, 2 the arm 1 of which constitutes the color setter and the arm 2 of which constitutes the color setter plate. The arm or color setter 1 co-operates in known manner with jacquard irons. I have abstained from showing also these irons because they do not form parts of the present invention.

The manner of operation of the device is as follows:

The thread that has been moved into working position by means of the thread setter 1, is gripped by the pincer limbs 3 and 4 and is drawn out. The pincers 5, 6, 7, 8 are turned approximately 90° by means of the toothed sectors 17 and 18 that is to say, from the vertical position into horizontal position, and simultaneously therewith the pincer limbs 6 and 8 are opened (position Fig. 2) by means of the pressure member 13 that has been actuated in the proper direction by the members 16, 15 and 14. The open pincer 5, 6, 7, 8 grips the thread 30, as in Fig. 2, instantly thereafter the pressure member 13 returns and the pincer limbs 6 and 8 are closed by the tensile spring 12, but not completely, as the thread is between them, in consequence whereof the key-shaped projection 25 cannot act upon the catch pawl 22.

If, however, the pincer limbs have not gripped a thread, they contact closely with one another under the pressure of the spring 12, and then the projection 25 can act upon the catch pawl 22 so as to turn it into the position shown in Fig. 3, in which it is able to catch the wire 26, in consequence whereof the contact arm 27 is drawn against the contact 29 so as to close an electric circuit into which means are inserted either giving an optical or an acoustic signal, or stopping the loom. The place at which the respective pawl 22 has acted on the wire 26 is distinctly visible by the bend there produced in the wire, and the attendant can, therefore, at once detect the corresponding pincers. The pawl 22 does not bend the wire when the pincers have gripped the threads in order to pull them with them for being worked, the catch pawl 22 remaining then in its position of rest, as in Fig. 2.

I claim:

1. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a catching pawl on one of the limbs of the pliers and a pressing member on the opposite limb, said pressing member being adapted to turn said pawl outwardly when the gripping limbs of the pliers completely close in consequence of their failure to grip a thread, and means actuated by said pawl for stopping the loom.

2. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a catching pawl on one of the limbs of the pliers and a pressing member on the opposite limb, said pressing member being adapted to turn said pawl outwardly when the gripping limbs of the pliers completely close in consequence of their failure to grip a thread, and means actuated by said pawl for producing a signal.

3. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a catching pawl on one of the limbs of the pliers and a pressing member on the opposite limb, said pressing member being adapted to turn said pawl outwardly when the gripping limbs of the pliers completely close in consequence of their failure to grip a thread, a wire arranged relatively to the said pawl and adapted to be caught thereby when said pawl has been turned outwardly, and means connected with said wire for stopping the loom.

4. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a catching pawl on one of the limbs of the pliers and a pressing member on the opposite limb, said pressing member being adapted to turn said pawl outwardly when the gripping limbs of the pliers completely close in consequence of their failure to grip a thread, a wire arranged relatively to the said pawl and adapted to be caught thereby when said pawl has been turned outwardly, and means connected with said wire for producing a signal.

5. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a catching pawl on one of the limbs of the pliers and a pressing member on the opposite limb, said pressing member being adapted to turn said pawl outwardly when the gripping limbs of the pliers completely close in consequence of their failure to grip a thread, a wire arranged relatively to the said pawl and adapted to be caught and bent thereby when said pawl has been turned outwardly, the bending of said wire indicating the place where the pliers have failed to grip a thread.

6. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a movable element on one of the limbs of the pliers, means operable upon a complete closing of the gripping members of the pliers in consequence of their failure to grip a thread to move said element relatively to said limb, and means actuated by said element for stopping the loom.

7. In a loom for the manufacture of carpets and the like, having pliers for gripping the threads, an improvement comprising a movable element on one of the limbs of the pliers, means operable upon a complete closing of the gripping members of the pliers in consequence of their failure to grip a thread to move said element relatively to said limb, and means actuated by said element for producing a signal.

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