H. ANNER & M. J. MARNEL.

COMBINATION HARNESS AND WARP STOP MOTION.

APPLICATION FILED DEC. 19, 1908.

936,847.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

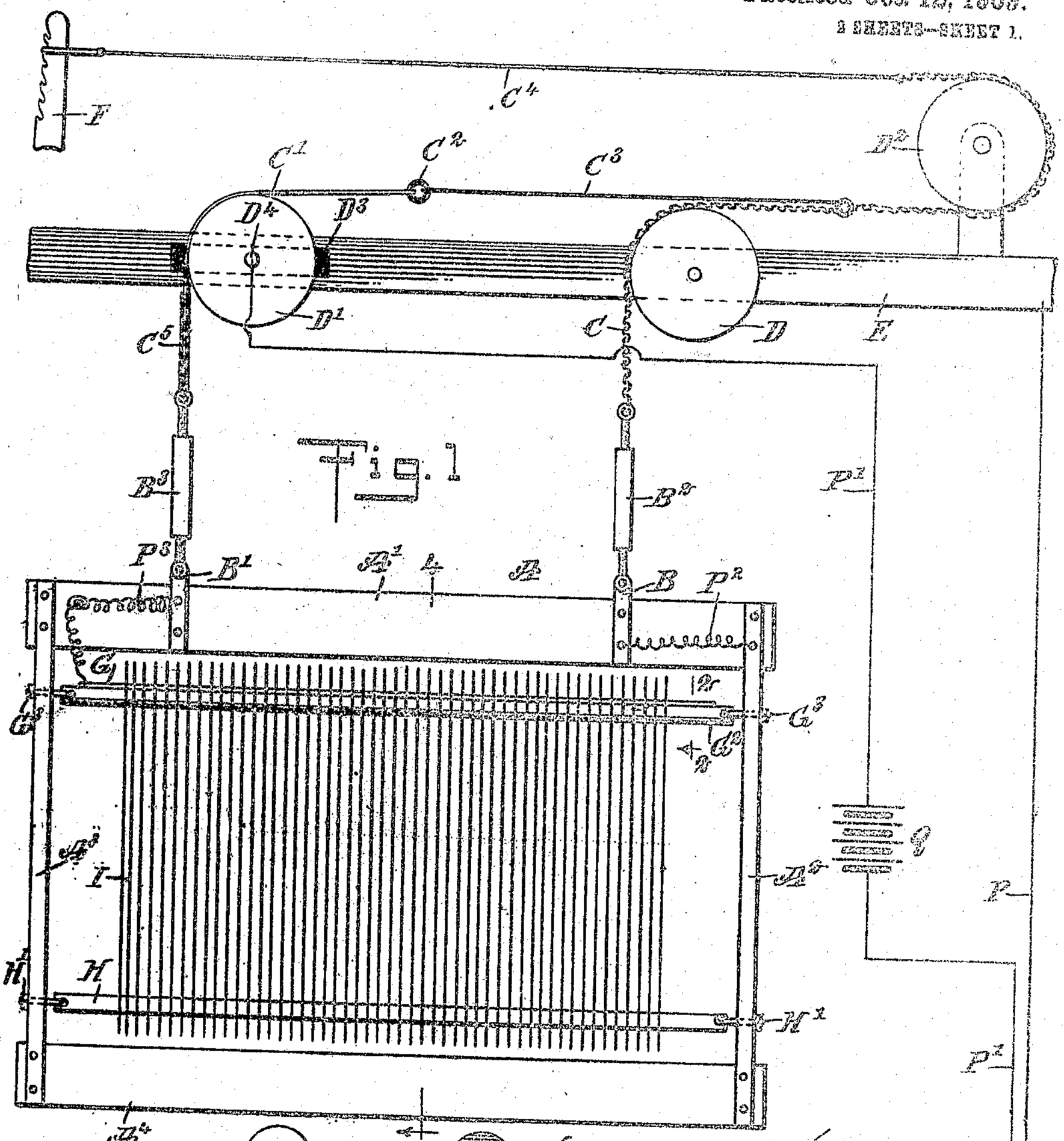


Fig. 1

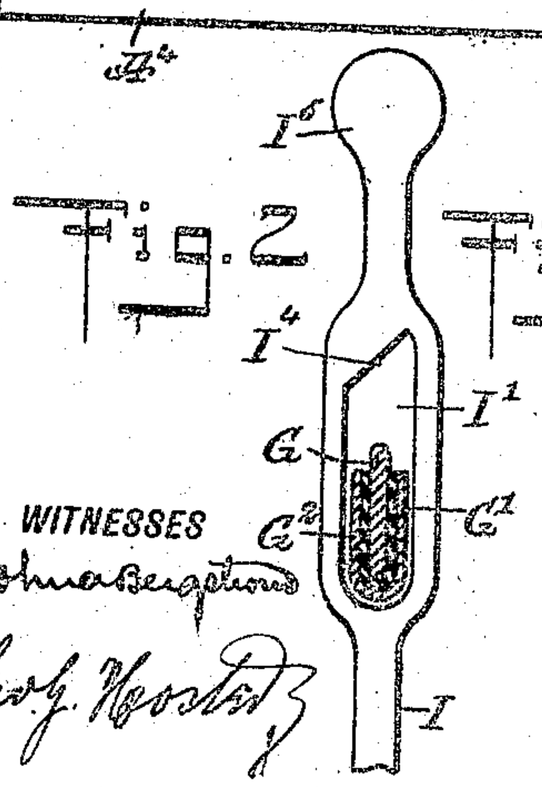


Fig. 2

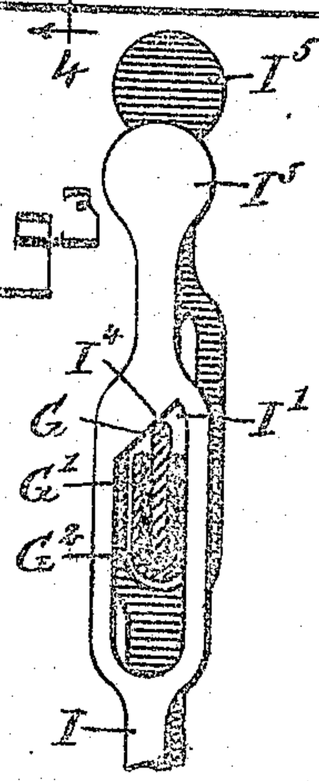
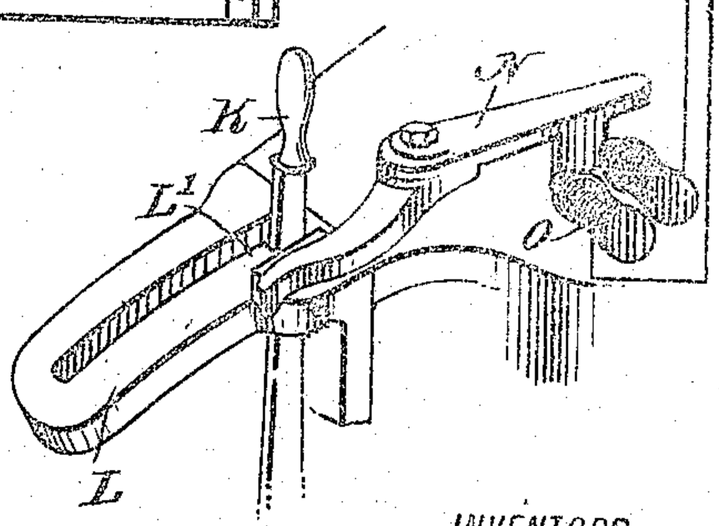


Fig. 3



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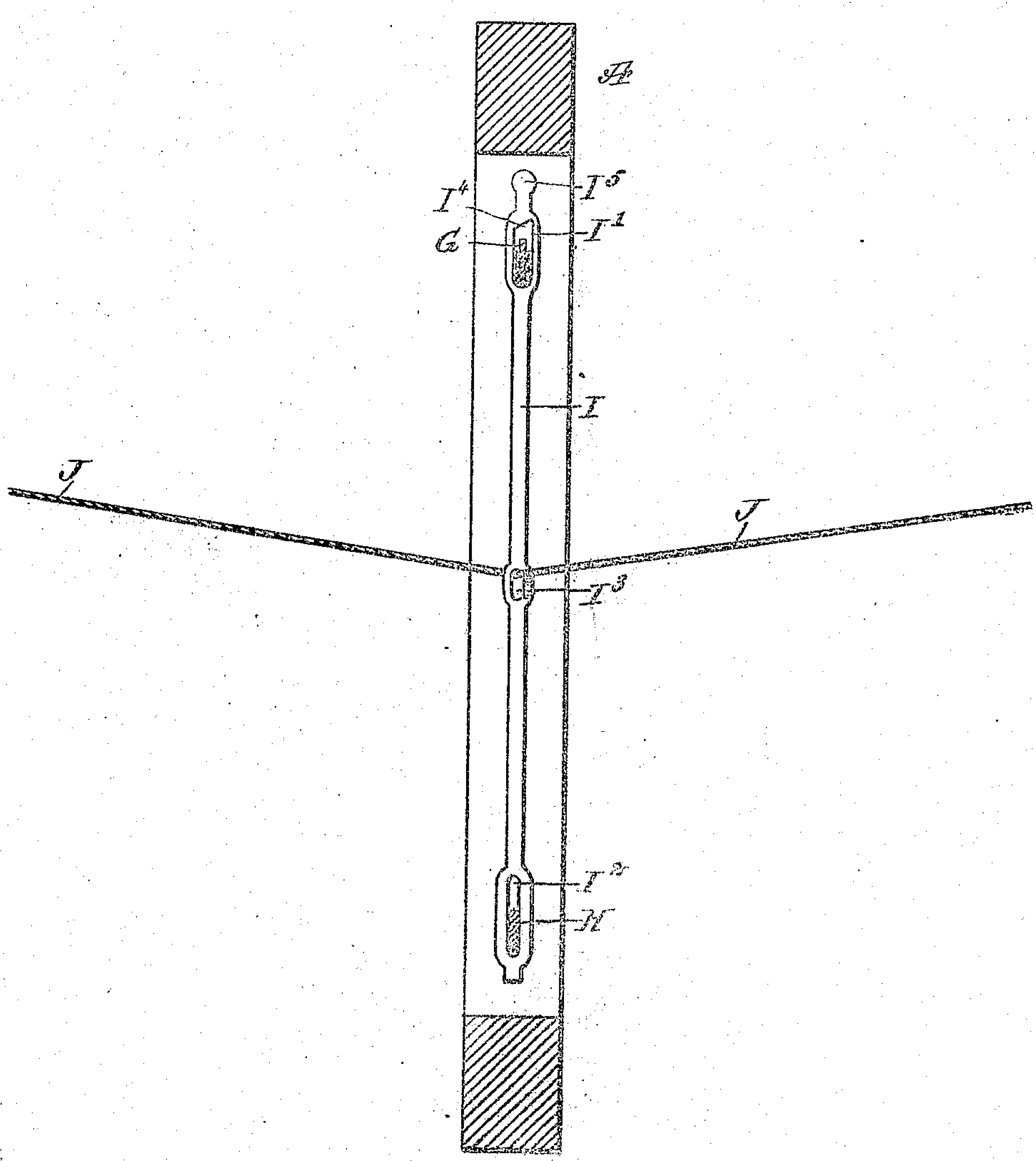

Fig. 4

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COMBINATION HARNESS AND WARP STOP-MOTION.

938,847. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed December 19, 1908. Serial No. 468,271.

To all whom it may concern:

Be it known that we, HENRY ANNER and MICHAEL J. MARNEL, both citizens of the United States, and residents of Phillipsburg, in the county of Warren and State of New Jersey, have invented a new and Improved Combination Harness and Warp Stop-Motion, of which the following is a full, clear, and exact description.

The invention relates to looms, and its object is to provide a new and improved combination harness and warp stop motion arranged to stop the loom in case a warp thread breaks, the breaking of a warp thread allowing its heddle to drop and close an electric circuit at the time the heddle frame moves into a lowermost position, the electric circuit controlling an actuating device for the usual stop motion of the loom.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the 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 is a front elevation of a loom harness provided with the improvement, part of the actuating mechanism being shown in perspective; Fig. 2 is an enlarged sectional side elevation of the upper heddle bar on the line 2—2 of Fig. 1; Fig. 3 is a like view of the same showing the parts in a different position; and Fig. 4 is a enlarged sectional side elevation of the harness on the line 4—4 of Fig. 1.

The heddle frame A of each of the heddles of a loom is provided at its top cross bar A′ with irons B, B′ connected with turn buckles B^2, B^3 hung on metallic flexible connections C, C′, such as cables, chains or the like, the said connections passing over pulleys D, D′ journaled on the loom frame E, the pulley D′ being preferably insulated from the metallic frame E, as indicated in Fig. 1. The flexible connection C′ is connected by an insulated ring C^2 with a cord C^3 attached to the flexible connection C at a point beyond the pulley D, and the said flexible connection C passes around a pulley D^2 journaled on the loom frame E, and the terminal of the connection C is connected by a cord or a cable C^4 with one of the arms F of the lifting device for the heddle frame, to raise and lower the heddle frame in the usual manner. As two or more heddle frames are usually employed on a loom it is understood that the heddle frames are moved alternately up and down, so that further description of the same is not deemed necessary. The upper cross bar G of the heddle frame A is held in an insulation G′ except the top portion thereof, and the insulation G′ is held in a metal sheath G^2 connected by bolts G^3 with the side arms A^2, A^3 of the heddle frame A. The lower cross bar H is attached by bolts H′ to the side bars A^2, A^3 of the heddle frame, it being understood that the lower ends of the side bars A^2, A^3 are connected with each other by the bottom heddle frame bar A^4.

Each of the heddles I is provided at its upper end with an eye I′ for the passage of the cross bar G, and an eye I^2 is formed on the lower portion of each heddle I for the passage of the lower cross bar H (see Fig. 4). At or near the middle of each heddle I is formed an eye I^3 for the passage of the corresponding warp thread J arranged in the usual manner in the loom, so that when the heddle frame A moves into a lowermost position, as shown in Fig. 4, then the heddles in this heddle frame A are raised relatively to the bars G and H, and when the heddle frame A moves upward and the warp threads J pass a straight middle position then the heddles I move downward relatively to the heddle frame A, so that the top wall I^4 moves in contact with the upper edge of the cross bar G. Now the top wall I^4 is inclined, as plainly shown in Figs. 2 and 3, so that a sliding contact is made between the cross bar G and the top wall I^4, to cause the sheath G^2 to move in contact with one side wall of the eye I′, as plainly indicated in Fig. 3. Now when the heddle frame A moves into a lowermost position and one of the warp threads J should break or become slack, it is evident that its corresponding heddle I is unsupported and consequently drops so as to make contact between the top wall I^4 and the upper projecting edge of the heddle bar G, and the side of the sheath G^2.

The stopping mechanism for the loom may be of any approved construction and provided with a lever K normally abutting against a shoulder L′ in a slotted arm L, to hold the lever K in an inactive normal posi-

tion. When the lever K is moved out of engagement with the shoulder L′ then it moves into an active position, to actuate the stopping mechanism and thus bring the loom to a stop. The lever K when in engagement with the shoulder L′ is engaged at one side by one end of a lever N forming the armature for a pair of electromagnets O having an electric circuit connected with the harness in a manner presently to be described in detail. The wire P of the electric circuit connects the electromagnets O with the metallic frame E of the loom, while the other wire P′ contains a battery Q and is connected with the shaft D^4 for the pulley D′ insulated by an insulation D^3 from the metallic frame E. The flexible connection C′ is provided in part of its length with an insulation C^5 which moves in contact with the pulley D′ at the time the heddle frame A is raised, to insulate the flexible connection C′ for the time being, that is, until the heddle frame A is again moved to a lowermost position, as then the insulation C^5 leaves the pulley D′ (see Fig. 1). The iron B is connected by a wire P^2 with the side arm A^2, and one end of the bar G is connected by a wire P^3 with the other iron B′, and consequently when the heddle frame A is in a lowermost position and the heddles I are raised by their warp threads J, as indicated in Fig. 4, then the top wall I^4 of the eye I′ is out of contact with the bar G and consequently the electric circuit is broken. When the heddle frame A is lifted by the lifting mechanism then the insulation C^5 moves in contact with the pulley D′, so that the flexible connection C′ is insulated from the pulley D′ at the time the top wall I^4 moves in contact with the bar G, and hence the circuit remains broken. When, however, the heddle frame A moves into a lowermost position as previously explained, and a warp thread J should break or become slack then its corresponding heddle I becomes unsupported and consequently drops, to make contact between the top wall I^4 and the bar G and the side of the sheath G^2, and as at this time the insulation C^5 is out of contact with the pulley D′ it is evident that the circuit is closed and the electromagnets O attract the armature lever N, which in turn moves the lever K out of engagement with the shoulder L′, and when this takes place the stop mechanism of the loom is actuated to stop the loom.

In order to enable the weaver to readily detect which of the warp threads J is broken, each heddle I is provided with a head I^5, preferably of ornamental shape, as indicated in Figs. 2, 3 and 4, so that a dropped heddle I can be readily seen by the lower position of its head I^5 relative to the heads I^5 of the adjacent heddles (see Fig. 3).

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. In an electric warp stop motion for looms, means for stopping the loom when a warp thread breaks allowing its heddle to close an electric circuit, the said means including an insulated pulley, and a flexible heddle frame support of conducting material passing over said pulley, the said pulley and flexible support being included in said circuit, the said flexible heddle frame support being provided with insulation on part of its length adapted to engage said pulley when the frame is raised.

2. In an electric stop motion for looms, an electric circuit for controlling the stopping mechanism, and adapted to be closed by a fallen heddle when the heddle frame is in its lowermost position, the said circuit including pulleys, flexible conductors passing over said pulleys and connected with the heddle frame and with the lifting mechanism for said frame, one of said flexible conductors having an insulated portion adapted to move in contact with its pulley when the heddle frame is raised to insulate the said flexible conductor from its pulley, the insulation leaving the pulley when the heddle frame is moved to a lowermost position.

3. In a device of the class described, means for operating the loom stop motion, and a circuit for actuating the said means and adapted to be closed by a fallen heddle when the heddle frame is in its lowermost position, the said circuit including the metallic loom frame, pulleys journaled on the loom frame one of said pulleys being insulated from the frame, flexible conductors passing over the pulleys and connected with the heddle frame and with the lifting device for the heddle frame, one of said flexible conductors being provided with an insulated portion adapted to move in contact with the pulley when the heddle frame is raised, the said insulated portion leaving the pulley when the heddle frame is moved to a lowermost position, and wires connecting the source of electricity with the loom frame and the shaft of the insulated pulley.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY ANNER.
MICHAEL J. MARNEL.

Witnesses:
OLIVER VAN BILLIARD.
JAMES VAN BILLIARD.