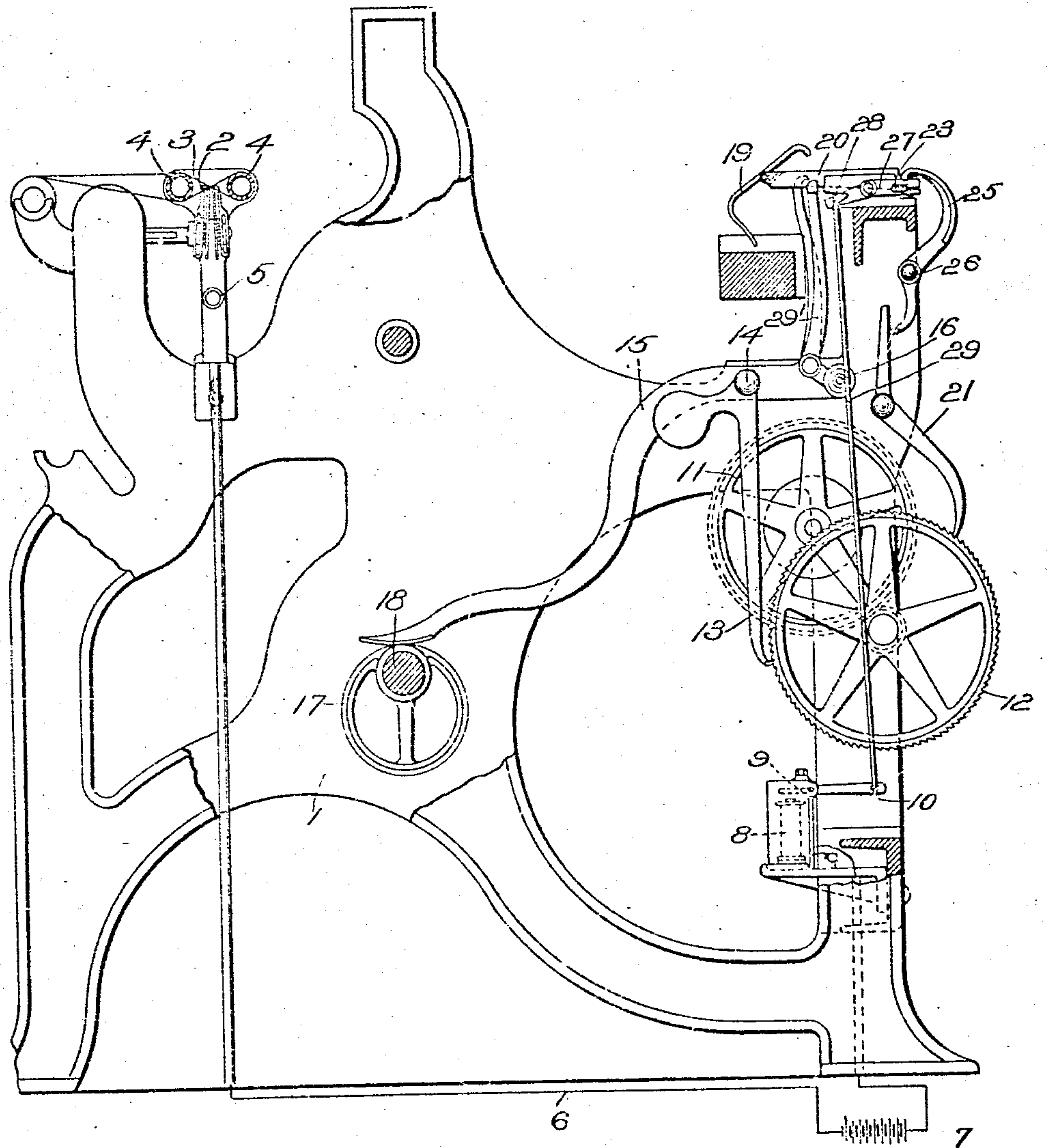


C. D. LANNING.
STOP MOTION FOR LOOMS.
APPLICATION FILED FEB. 23, 1907.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Jesse A. Holton.
Irving U. Townsend

Inventor:
Charles D. Lanning
by
Emery & Booth, Attys.

No. 871,875.

PATENTED NOV. 26, 1907.

C. D. LANNING.
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4 SHEETS—SHEET 2.

Fig. 2.

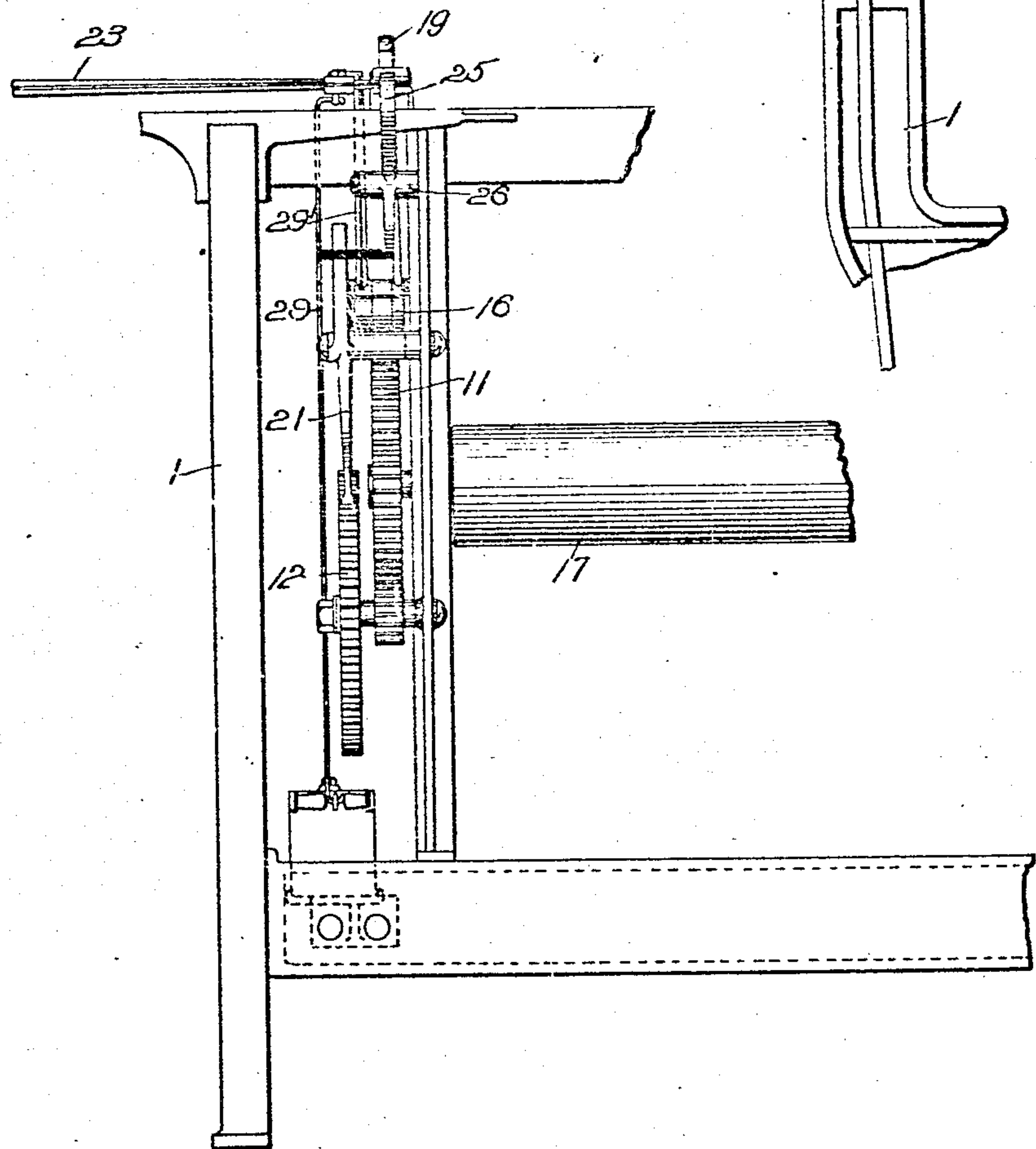
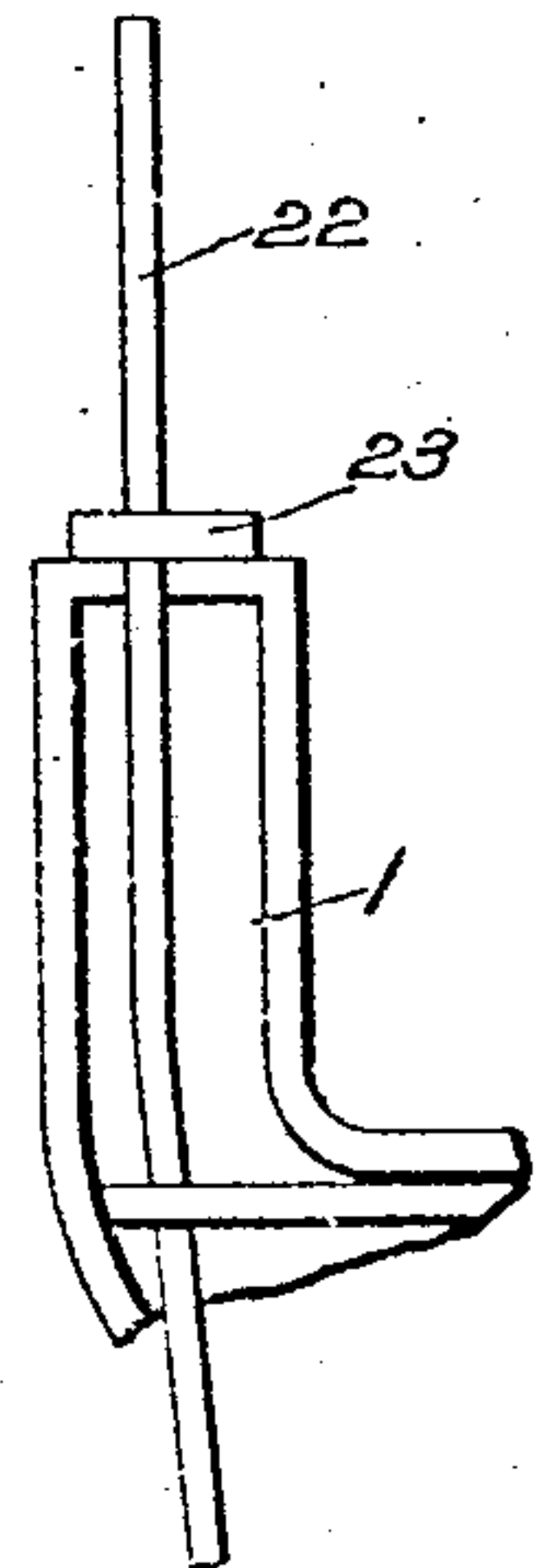


Fig. 1.



Witnesses:
Jesse A. Holton.
Irving U. Townsend

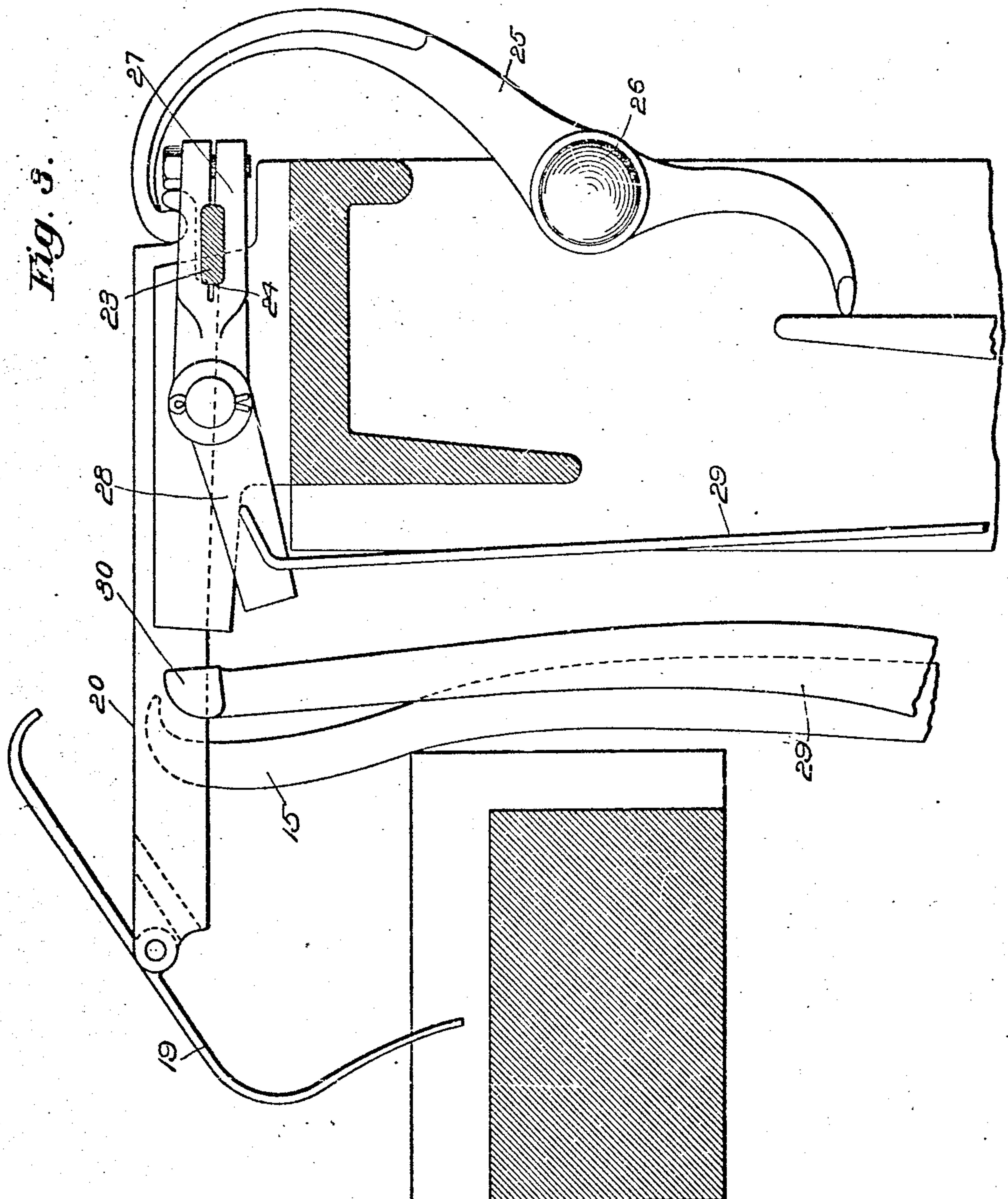
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 5.

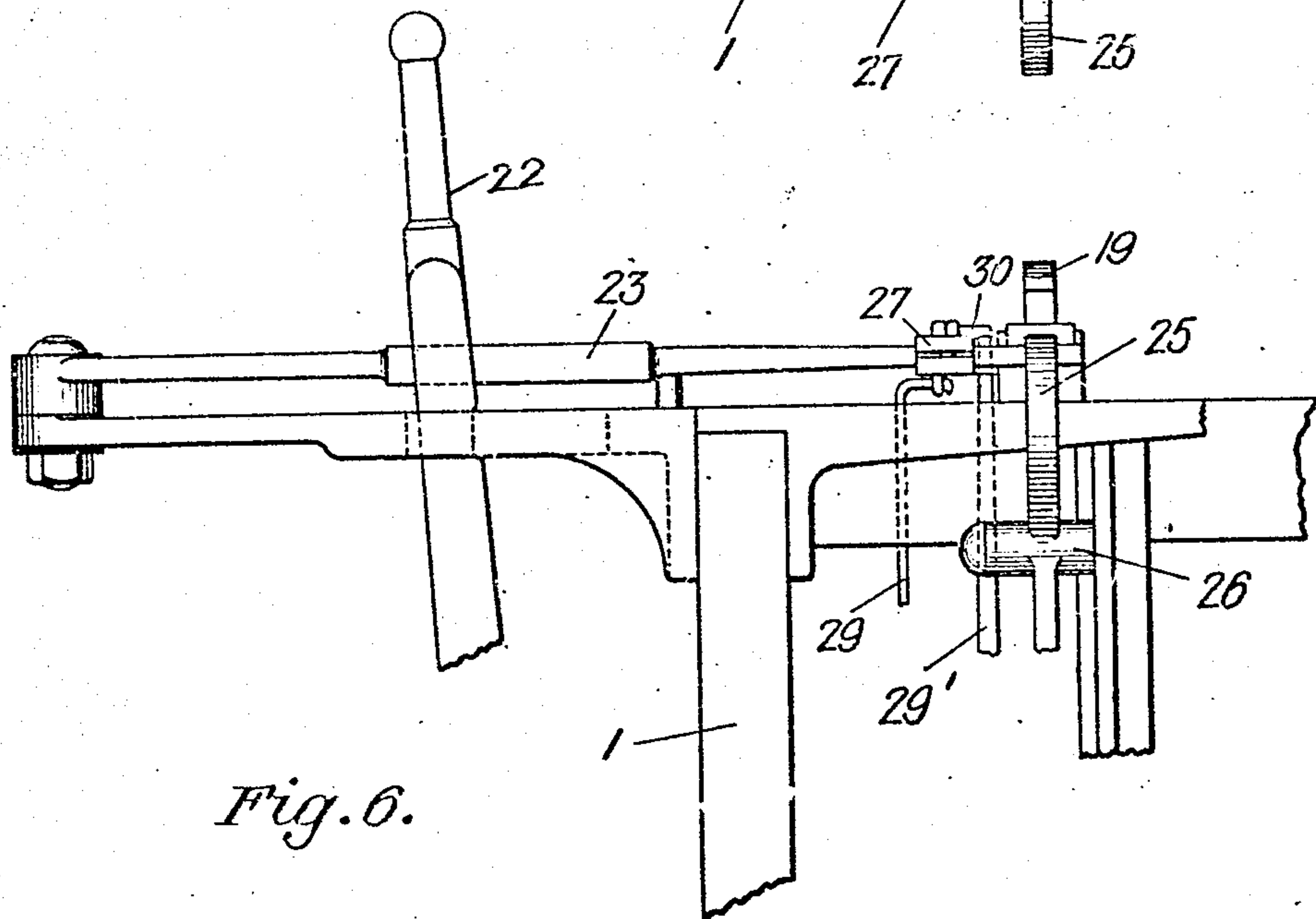
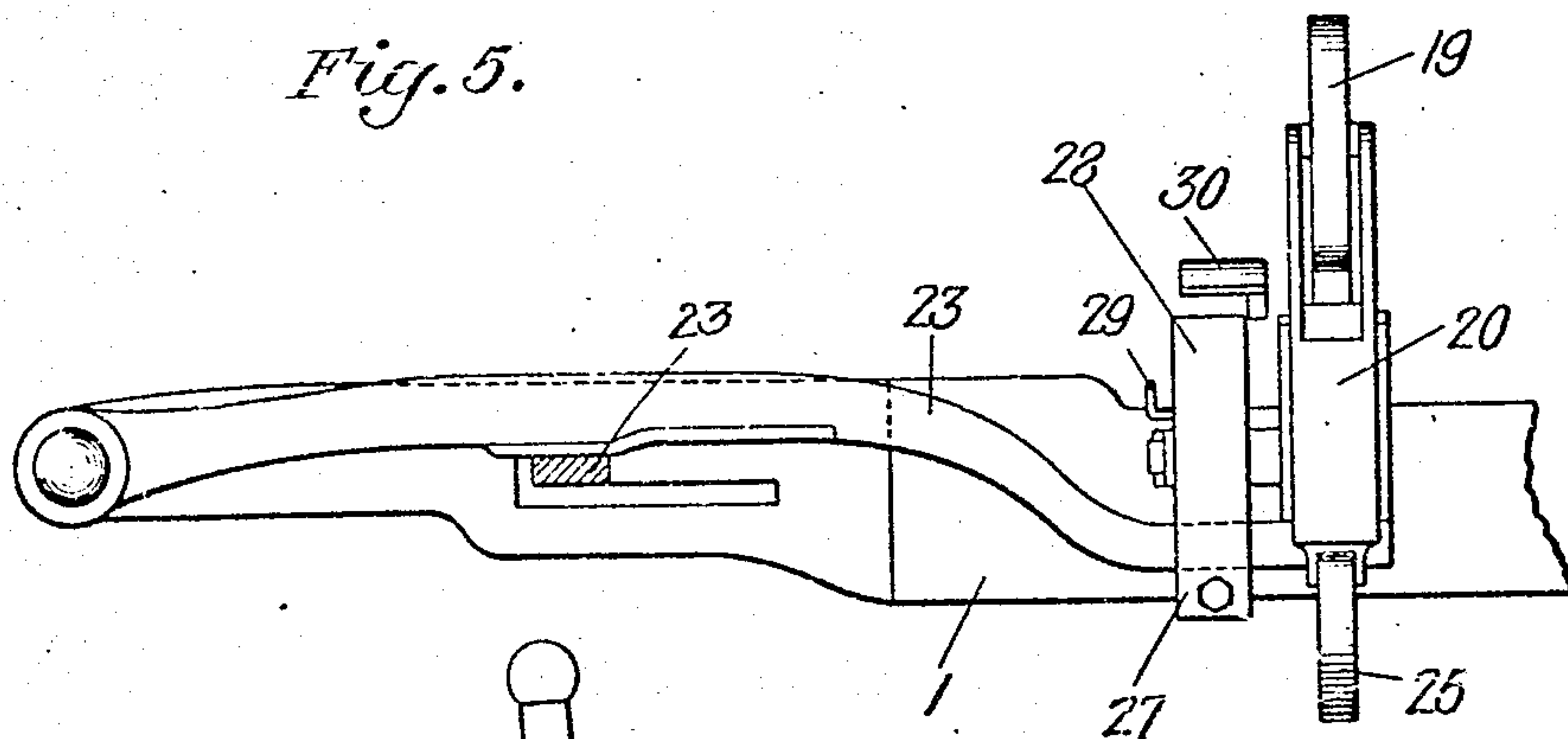


Fig. 6.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES D. LANNING, OF DORCHESTER, MASSACHUSETTS.

STOP-MOTION FOR LOOMS.

No. 871,875.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed February 23, 1907. Serial No. 358,822.

To all whom it may concern:

Be it known that I, CHARLES D. LANNING, a citizen of the United States, residing at Dorchester, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to stop motions which, while they may be of general application, are particularly intended for use in connection with looms for weaving.

In order that the principles of the invention may be fully understood I have in the accompanying drawings typified one embodiment thereof, wherein

Figure 1 is a vertical transverse section of a loom whereto my invention is applied; Fig. 2 is a side elevation of a portion of a loom whereto my invention is applied; Fig. 3 is a vertical transverse section on an enlarged scale of a portion of the mechanism shown in Figs. 1 and 2; Fig. 4 is a detail showing a portion of the shipper device; Fig. 5 is a plan view of the knock-off device in its relation to the parts operative upon warp fault and weft failure; and Fig. 6 is a side elevation thereof.

An object of my invention is to provide a simple means for stopping the loom upon the occurrence of weft failure or a warp fault. It is customary to employ the lay as a cooperating element to stop the loom in the event of a warp fault, this being frequently accomplished by moving a bunter into the path of the lay whereupon the lay impacting upon the bunter throws the shipper handle out of its retaining notch and stops the loom. Usually such bunter is at or near one end of the lay and the result of the impact of the lay upon the bunter is frequently to twist the lay, leaving a mark upon the goods. Preferably, therefore, I operate the shipper lever upon the occurrence of either weft failure or warp fault from a reciprocating member mounted independently of the lay. By a reciprocating member, I mean one having movement relative to the shipper lever.

Referring to the drawings, the frame of the loom is indicated at 1, it being of any suitable construction. Herein, my invention is shown as applied to a loom of the type disclosed in the patent to Coldwell & Gildard, No. 690,623, Jan. 7, 1902, although it will, of course, be apparent that the invention may

be applied to any desired type of loom.

While a warp stop motion of any suitable type may be employed, herein I employ warp drops 2 (Fig. 1) adapted to be mounted upon the warp threads 3, which may be suitably supported upon leasing members 4, whereby upon the occurrence of a warp fault contact is made at one end of the warp drops with a bar 5, an electric circuit 6 having therein a battery 7, being completed, the magnet 8 in said circuit being energized to attract the armature 9, so that in the present embodiment of the invention the member 10 of the armature may be elevated. The magnet 8 and its related parts may be suitably disposed at any desired part of the loom, it being herein shown as mounted upon the frame beneath the take-up mechanism.

A cloth roll of any suitable type is indicated at 11, it being operated in any suitable manner to take up the cloth as woven and herein by means of a ratchet gear 12 with the teeth whereof engages an actuating pawl 13 herein shown as pivotally mounted at 14 upon a reciprocatory member 15, which, in the present embodiment of the invention, is a weft hammer pivoted at 16 and adapted to be operated in any usual manner as by means of a cam 17 upon a cam shaft 18, whereby upon alternate beats of the lay the upper portion of the weft hammer is reciprocated to feel for the weft fork 19, so that if it be not tilted by the presence of weft, the weft fork carrier 20 is moved upon its support to stop the loom. Preferably I employ means herein consisting of a holding pawl 21 to prevent reverse movement of the cloth roll.

A shipper device of any suitable type such as that indicated in the patent to Coldwell & Gildard may be employed, and herein is indicated in Fig. 4 at 22, it being normally positioned in the usual notch, whereby the parts of the loom are maintained in running position, the shipper device being adapted to be actuated to stop the loom in any suitable manner as by engagement therewith of a knock off device, herein represented as a lever 23, a portion thereof being shown in side elevation in Fig. 2 and in vertical section in Figs. 1 and 3. As indicated most clearly in Fig. 3, when the weft fork 19 is not tilted, the weft fork carrier is moved to the right viewing said figure, by reason of the engagement of the weft fork by the weft hammer 15, a shouldered portion 24 upon

the lower side of the weft fork carrier impinging against the knock off lever, thereby moving the same to stop the loom.

Preferably I suspend the operation of the take-up mechanism upon the occurrence of weft failure and to that end may operatively connect the take-up mechanism in any suitable manner with the weft fork carrier. Herein for the purpose, I employ a lever 25 pivoted at 26 upon the frame of the machine, the lower end of said lever being adapted to engage with a portion of the holding pawl 21, thereby to withdraw it from engagement with the ratchet gear 12 of the take-up mechanism, the upper end of said lever 25 engaging in any suitable manner with the weft fork carrier 20 as indicated in Fig. 3, whereby upon movement of the carrier to the right viewing said figure the holding pawl 21 is disengaged from the ratchet 12, thus suspending the action of the take-up mechanism.

In order to stop the loom on the occurrence of a warp fault without the use of the lay as a cooperating element, I employ a movable member which, in the present embodiment of the invention, is the weft hammer 15. Inasmuch as said weft hammer constitutes a portion of the train of mechanism for stopping the loom in the event of weft failure, I am enabled, by using said weft hammer to stop the loom upon the occurrence of a warp fault, greatly to simplify the parts while at the same time overcoming the objections heretofore set forth incident upon the use of the lay as an element of the stop motion mechanism.

While I may operate the shipper lever upon the event of warp failure, by the use of the movable member which herein is the weft hammer, in various ways, in the present type of the invention I bolt a casting 27 upon the knock-off lever as indicated in Figs. 1 and 3 and pivotally mount upon said casting a lever 28 operatively connected with the arm 10 of the armature as by a wire 29, whereby when the armature 9 is attracted the lever 28 is elevated.

While I may in any desired manner employ the weft hammer to cooperate with said lever 28 when elevated, in the present embodiment of the invention I bolt upon one side of the weft hammer an auxiliary member 29 preferably having a head 30 projecting laterally from the plane of the body thereof, so that in the normal working of the parts the lever 28 when depressed is not impinged upon by the body of said auxiliary member 29. When said lever 28 is elevated as described, it is impinged upon by the head 30, thereby actuating the knock-off lever 23 to stop the loom.

As most clearly indicated in Fig. 3, the lever 25 which throws out of operation the holding pawl 21 of the take-up mechanism

is so curved or formed that the knock-off lever may be actuated upon the occurrence of a warp fault without interrupting the take-up mechanism. In such event the knock-off lever 23 is moved from the position indicated in Fig. 3 to the right viewing said figure without movement of the weft fork carrier 20 and hence without movement of the lever 25.

By the construction described, I avoid the objection incident to mounting the armature of the magnet upon the knock off lever or weft fork carrier and am enabled independently to operate the knock off lever upon the occurrence of weft failure or warp fault. Moreover I am enabled to locate the magnet and armature at any desired part of the loom.

By the employment of the weft hammer 15, I am enabled to utilize the single cam 17 to stop the loom upon the occurrence of either weft failure or warp fault, thereby doing away with a multiplicity of parts.

Important features of my invention are the provision of simple means whereby, in looms equipped with the usual weft-stop mechanism, comprising a weft fork and a weft fork carrier or mounting, and means actuated by the movement of said carrier or mounting to release or throw the shipper handle, (particularly where the take-up holding means are also released by or with the weft-fault-caused movement of said carrier) the same shipper handle releasing means can be used as part of an independently cooperative warp-fault-detecting-and-loom-stopping mechanism without affecting said weft fork carrier or take-up holding means; and the provision of means whereby, in a loom having the common weft-stop mechanism, comprising a weft fork, weft fork carrier, weft hammer lever and other usual connections, the same vibratory member other than the lay, which in this embodiment of the invention is the weft hammer lever, is made part of warp-stop mechanism, cooperating independently of the weft-stop mechanism and operatively independent of the weft fork and weft fork carrier.

While an electrical warp stop mechanism is herein shown, it will be apparent that I am not to be restricted thereto save when expressly so stated in the claims.

Having thus described one type or embodiment of my invention, I desire it to be understood that although I have employed specific terms, they are used in a descriptive and generic sense and not for purposes of limitation, the scope of the invention being set forth in the claims.

1. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock off device adapted to release the shipper device

from said retaining means, weft thread fault detecting means, devices cooperating therewith and with said reciprocatory member, whereby the knock-off device is moved and the loom is stopped upon the occurrence of weft failure, warp thread fault detecting means, and means independent of said weft thread fault detecting means and of said devices cooperating therewith and adapted to cooperate with said warp thread fault detecting means and with said reciprocatory member, whereby the knock-off device is moved and the loom is stopped upon the occurrence of warp failure.

2. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, weft thread fault detecting means, devices cooperating therewith and with said reciprocatory member, whereby the knock-off device is moved and the loom is stopped upon the occurrence of weft failure, electric warp thread fault detecting means and means distinct from the said weft thread fault detecting means and devices cooperating therewith and adapted to cooperate with said warp thread fault detecting means and with said reciprocatory member, whereby the knock-off device is moved and the loom is stopped upon the occurrence of warp failure.

3. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, weft thread fault detecting means, devices cooperating therewith and with said reciprocatory member, whereby the knock-off device is moved and the loom is stopped upon the occurrence of weft failure, drop bars mounted upon the warp threads, means moved by an indicating drop bar into the path of movement of the reciprocatory member, said means being mounted independently of the weft thread fault detecting means and devices cooperating therewith and adapted when moved into the path of movement of the reciprocatory member to be operated, thereby to move the knock-off device and stop the loom upon the occurrence of weft failure.

4. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, warp fault detecting means, and

means distinct from said weft fork slide and adapted upon the occurrence of a warp fault to be brought into the path of movement of the reciprocatory member, and thereby moved to operate the knock-off device.

5. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, drop bars supported upon the warp threads, and means moved by indicating drop bars into the path of movement of the reciprocatory member, said means being disconnected from said weft fork slide and being adapted when brought into the path of movement of the reciprocatory member to be moved, thereby to operate the knock-off device.

6. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, warp fault detecting means, and means mounted upon the knock-off device and adapted upon the occurrence of a warp fault to be brought into the path of movement of the reciprocatory member.

7. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, drop bars supported upon the warp threads, circuit establishing means cooperating with an indicating drop bar and including a magnet mounted independently of the weft fork slide, means moved by said magnet, when energized, into the path of the said reciprocatory member and operatively connected to the knock-off device to move the same when operated by the said reciprocatory member.

8. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork,

a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, electrical warp fault detecting means including a magnet mounted independently of the weft fork slide, and means moved by said magnet, when energized, into the path of the said reciprocatory member and operatively connected to the knock-off device to move the same when operated by the said reciprocatory member.

9. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, take-up mechanism, means to arrest the same upon the occurrence of weft failure, warp fault detecting means, and means independent of said weft fork slide operatively connected to said warp fault detecting means and adapted to be moved thereby into the path of movement of said reciprocatory member and when moved by said reciprocatory member to thereupon operate the knock-off device, the take-up suspending mechanism being non-actuated upon the occurrence of warp failure.

10. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-off device, drop bars supported upon the warp threads, and means mounted upon the knock-off lever and adapted upon the indicating movement of a drop bar to be brought into the path of movement of the reciprocatory member, to thereupon operate the knock-off device, take-up mechanism, and means to arrest the operation of the same upon weft failure, said take-up suspending mechanism being non-actuated upon the occurrence of warp failure.

11. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork slide whereon the same is mounted, said slide being adapted to be moved by the reciprocatory member upon the occurrence of weft failure, thereby to move the knock-

off device, drop bars supported upon the warp threads, electric circuit establishing means coöperating with an indicating drop bar and including a magnet mounted independently of the weft fork slide, means operatively connected to said magnet and adapted when the latter is energized to be brought into the path of movement of said reciprocatory member, take-up mechanism, and means operative upon weft failure to suspend the operation thereof, said take-up suspending mechanism being non-actuated upon the occurrence of warp fault.

12. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, take-up mechanism, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon weft failure, operative connections between said reciprocatory member and the take-up mechanism, whereby the take-up may be interrupted upon weft failure, warp fault detecting mechanism, a movable member supported by the knock-off device and distinct from the said operative connections for stopping the loom upon weft failure, and operative connections between said movable member and said warp fault detecting mechanism, whereby the loom may be stopped upon the occurrence of a warp fault.

13. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, take-up mechanism, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon weft failure, operative connections between said reciprocatory member and the take-up mechanism, whereby the take-up may be interrupted upon weft failure, warp fault detecting mechanism, a movable member mounted on the knock-off device and distinct from the said operative connections for stopping the loom upon weft failure, and operative connections between said movable member and said warp fault detecting mechanism, whereby the loom may be stopped upon the occurrence of a warp fault.

14. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, take-up mechanism, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon weft failure, operative connections be-

tween said reciprocatory member and the take-up mechanism; whereby the take-up may be interrupted upon weft failure, warp fault detecting mechanism, a movable member pivotally connected to the knock-off device, and operative connections between said movable member and said warp fault detecting mechanism, whereby the loom may be stopped upon the occurrence of a warp fault.

15. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, take-up mechanism, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon weft failure, operative connections between said reciprocatory member and the take-up mechanism, whereby the loom may be interrupted upon weft failure, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, a movable member supported by the knock-off device and distinct from the said operative connections for stopping the loom upon weft failure and operative connections between the said movable member and said armature, whereby upon actuation of the armature said movable member is adapted to be brought into the path of movement of said reciprocatory member to stop the loom.

16. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, take-up mechanism, operative connections between said reciprocatory member and said knock-off lever, whereby the loom may be stopped upon weft failure, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, a movable member mounted on the knock-off device and distinct from the said operative connections for stopping the loom upon weft failure, and operative connections between the same movable member and said armature, whereby upon actuation of the armature said movable member is adapted to be brought into the path of movement of said reciprocatory member to stop the loom.

17. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, take-up mechanism,

operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon weft failure, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, a movable member pivotally connected to the knock-off device, and operative connections between the said movable member and said armature, whereby upon actuation of the armature said movable member is adapted to be brought into the path of movement of said reciprocatory member to stop the loom.

18. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, operative connections between said reciprocatory member and said knock-off device, said operative connections being mounted independently of the knock-off device and adapted to cooperate therewith, whereby the loom may be stopped upon the occurrence of weft failure, and operative connections between said reciprocatory member and the knock-off device, distinct from said previously mentioned operative connections, whereby the loom may be stopped upon the occurrence of a warp fault.

19. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon the occurrence of weft failure, operative connections between said reciprocatory member and the knock-off device distinct from said previously mentioned operative connections, whereby the loom may be stopped upon the occurrence of a warp fault, and take-up mechanism adapted to be suspended upon weft failure.

20. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon the occurrence of weft failure, operative connections between said reciprocatory member and the knock-off device distinct from said previously mentioned operative connections, whereby the loom may be stopped upon the occurrence of a warp fault, and take-up mechanism adapted

to be suspended upon weft failure but continue in operation upon warp failure.

21. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, operative connections between said reciprocatory member and said knock-off device whereby the loom may be stopped upon the occurrence of weft failure, and operative connections between said reciprocatory member and the knock-off device, distinct from said previously mentioned operative connections and including said armature, whereby the loom may be stopped upon the occurrence of a warp fault.

22. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, operative connections between said reciprocatory member and said knock-off device, whereby the loom may be stopped upon the occurrence of weft failure, operative connections between said reciprocatory member and the knock-off device distinct from said previously mentioned operative connections and including said armature, whereby the loom may be stopped upon the occurrence of a warp fault, take-up mechanism, and means to interrupt the same upon the occurrence of weft failure, the connections being such that the take-up mechanism is not interrupted upon the occurrence of warp failure.

23. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft failure detecting device, a carrier therefor, said carrier being separate from but operatively connected to the knock-off device and adapted to be actuated by said reciprocatory member upon the occurrence of weft failure, whereby the loom may be stopped, and a device independent of said carrier adapted to be actuated upon the occurrence of a warp fault, and operative connections therefrom to the knock-off device, whereby the loom may be stopped upon the occurrence of a warp fault.

24. A loom comprising a lay, a reciprocatory member mounted independently of the

lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft failure detecting device, a carrier therefor, said carrier being operatively connected to the knock-off device and adapted to be actuated by said reciprocatory member upon the occurrence of weft failure, whereby the loom may be stopped and a device independent of said carrier adapted to be actuated upon the occurrence of a warp fault, operative connections therefrom to the knock-off device, whereby the loom may be stopped upon the occurrence of a warp fault, take-up mechanism and means to operate the same upon the occurrence of weft failure, the connections being such that the take-up mechanism is not interrupted upon the occurrence of a warp failure.

25. A loom comprising a lay, a reciprocatory member mounted independently of the lay, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, said reciprocatory member having two operating portions, a weft failure detecting device, a carrier therefor, said carrier being mounted independently of but adapted to operate the knock-off device and adapted to be actuated by one of said portions of said reciprocatory member upon the occurrence of weft failure, thereby to stop the loom, and operative connections between said other operating portion of the reciprocatory member and the knock-off device, whereby the loom may be stopped upon the occurrence of a warp fault.

26. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork carrier therefor mounted independently of but adapted to operate the knock-off device, whereby upon the occurrence of weft failure the loom may be stopped, a member carried by said weft hammer and positioned out of the path of movement of the weft fork, and operative connections between said member and the knock-off device, whereby the loom may be stopped upon the occurrence of a warp fault.

27. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork carrier therefor mounted independently of but adapted to operate the knock-off device, whereby upon the occurrence of weft failure the loom may be stopped, a member

carried by said weft hammer and in its motion not impinging upon the weft fork, a movable member mounted upon the knock-off device and adapted to be actuated by said member carried by the weft hammer, whereby upon the occurrence of a warp fault the knock-off device is actuated to stop the loom.

28. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, a weft fork, a weft fork carrier therefor mounted independently of but adapted to operate the knock-off device, whereby upon the occurrence of weft failure the loom may be stopped, a member carried by said weft hammer and in its motion not impinging upon the weft fork, a movable member pivotally mounted upon the knock-off device and adapted to be actuated, whereby upon the occurrence of a warp fault the knock-off device is actuated to stop the loom.

29. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, a movable member supported by the knock-off device, a weft fork, a weft fork carrier therefor, whereby upon the occurrence of weft failure the loom may be stopped, a member carried by said weft hammer and in its motion not impinging upon the weft fork, said movable member supported by the knock-off device being adapted to be actuated by said member carried by the weft hammer, whereby upon the occurrence of a warp fault the loom may be stopped.

30. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, a movable member supported by the knock-off device, a weft fork, a weft fork carrier therefor, whereby upon the occurrence of weft failure the loom may be stopped, a member carried by said weft hammer and in its motion not impinging upon the weft fork, said movable member supported by the knock-off device being adapted to be actuated by said member carried by the weft hammer, whereby upon the occurrence of a warp fault the loom may be stopped, take-up mechanism, and means to

suspend the operation thereof upon the occurrence of weft failure.

31. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, warp drops adapted to be supported upon the warp threads, an electric circuit including a magnet and adapted to be completed upon the occurrence of a warp fault, an armature, a movable member supported by the knock-off device, a weft fork, a weft fork carrier therefor, whereby upon the occurrence of weft failure the loom may be stopped, a member carried by said weft hammer and in its motion not impinging upon the weft fork, said movable member supported by the knock-off device being adapted to be actuated by said member carried by the weft hammer, whereby upon the occurrence of a warp fault the loom may be stopped, take-up mechanism, and means to interrupt the same upon the occurrence of weft failure, the take-up suspending mechanism being non-actuated upon the occurrence of warp failure.

32. A loom comprising a lay, a weft hammer, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device from said retaining means, warp fault detecting means, a movable member supported by the knock-off device, a weft fork, a weft fork carrier therefor, whereby upon the occurrence of weft failure the loom may be stopped, a member carried by said weft hammer and in its motion not impinging on the weft fork, said movable member supported by the knock-off device being adapted to be actuated by said member carried by the weft hammer, whereby upon the occurrence of a warp fault the loom may be stopped, take-up mechanism, and means to suspend the operation thereof upon the occurrence of weft failure.

33. A loom comprising a lay, a reciprocatory member independent thereof, a shipper device, means to retain the same in loom operating position, a knock-off device adapted to release the shipper device, a movable member supported by the knock-off device, a weft fork, a weft fork carrier therefor, whereby upon the occurrence of weft failure the loom may be stopped, said weft fork carrier being mounted separately from but adapted to operate said knock-off device and a member carried by said weft hammer and in its motion not impinging upon the weft fork, said movable member supported by the knock-off device being adapted to be actuated by said member carried by the weft hammer, whereby upon the occurrence of a warp fault, the loom may be stopped.

34. In a loom having a lay, a shipper handle, means to retain said shipper handle in loom-operating position, means adapted, upon release of said shipper handle, to throw
5 said shipper handle to a loom-stopping position; and a shipper handle releasing device; the combination of weft-thread-fault-detecting-and-loom-stopping devices, a weft hammer lever, actuating means therefor, a weft
10 hammer, a weft fork, and a weft fork carrier, adapted, upon occurrence of a weft thread fault, to actuate said shipper handle releasing device and thereby stop the loom, and independently cooperating warp-thread-fault-
15 detecting-and-loom-stopping devices, operatively independent of said weft fork and weft fork carrier and adapted, upon the occurrence of a warp-thread fault, to actuate said shipper handle releasing device and thereby
20 stop the loom.

35. In a loom having a lay, a shipper handle, means to retain said shipper handle in loom-operating position, means adapted, upon release of said shipper handle, to throw
25 said shipper handle to a loom-stopping position, a shipper handle releasing device, take-up mechanism, and holding means therefor, adapted to be moved and to release the take-up on a weft-fault stopping movement of said
30 shipper handle releasing device; the combination of weft-thread-fault-detecting-and-loom-stopping devices, including a weft hammer lever, actuating means therefor, a weft hammer, a weft fork and a weft fork carrier,
35 adapted, upon the occurrence of a weft-thread-fault to actuate said shipper handle releasing device and to disengage said take-up holding means; and independently cooperating warp-thread-fault-detecting-and-loom-
40 -stopping devices, operatively independent of said weft fork, weft fork carrier, and take-up holding means, and adapted, upon occurrence of a warp-thread fault, to stop the loom without actuation of said take-up
45 holding means.

36. In a loom having a lay, a shipper handle, means to retain said shipper handle in loom-operating position, and means adapted to throw said shipper handle to a loom-stopping
50 position; the combination of weft-fault-detecting-and-loom-stopping devices, comprising a vibratory member other than the lay, and means including a weft-fault detector and a movable carrier therefor, adapted
55 to be actuated by said vibratory member to stop the loom upon occurrence of a weft-thread fault; and independently cooperating warp-thread-fault-detecting-and-loom-stopping devices, operatively related to said vibratory member and adapted to be operated
60 thereby to stop the loom on occurrence of a warp-thread fault, but operatively independent of the movable carrier on which said weft-fault detector is mounted.

37. In a loom having a lay, a shipper handle, means to retain said shipper handle in loom-operating position, and means adapted, upon the release of said shipper handle
65 by said retaining means, to throw said shipper handle to a loom-stopping position, and a shipper-handle-releasing device; the combination of weft-thread-fault-detecting-and-loom-stopping devices, including a weft
70 hammer lever, actuating means therefor, a weft hammer, a weft fork and a weft fork carrier, adapted, through the actuation thereby of the shipper handle releasing device, to stop the loom upon occurrence of a
75 warp-thread-fault and independently cooperating warp thread fault detecting-and-loom-stopping devices, including stopping means intermediate said weft hammer lever and said shipper handle operatively related
80 to said weft hammer lever but operatively independent of said weft fork and weft fork carrier and adapted to stop the loom upon occurrence of a warp-thread fault.

38. In a loom having a lay, a shipper handle, means to retain said shipper handle in loom-operating position, means adapted, upon the release of said shipper handle to throw said shipper handle to a loom-stopping
90 position, shipper handle releasing means, take-up mechanism and take-up mechanism holding means; the combination of weft-thread-fault-detecting-and-loom-stopping devices, including a weft hammer lever, actuating means therefor, a weft hammer,
95 a weft fork, and a weft fork carrier, adapted, upon occurrence of a weft-thread fault, to actuate said shipper handle releasing means, thereby to cause the stopping of the loom and further adapted to cause the release of said take-up mechanism holding
100 means; and independently cooperating warp-thread-fault-detecting-and-loom-stopping devices, including stopping means intermediate said weft hammer lever and shipper handle operatively related to said weft hammer but operatively independent
105 of said weft fork, weft fork carrier and said take-up holding means and adapted to stop the loom without affecting said take-up, upon occurrence of a warp-thread fault.

39. In a loom having a lay, a shipper handle, means to retain said shipper handle in loom operating position, and means adapted to throw said shipper handle to a loom stopping
115 position; the combination of weft fault detecting and loom stopping devices, comprising a shaft, a rotary cam member thereon, a weft fault detector and a movable carrier therefor, an operative connection between said rotary cam member and said weft
120 fault detector and carrier adapted to be actuated by said rotary cam member to stop the loom upon occurrence of a weft thread fault, and independently cooperating warp
125

thread fault detecting and loom stopping devices operatively related to said rotary cam member and adapted to be operated thereby to stop the loom on occurrence of a warp
5 thread fault, but operatively independent of the movable carrier on which said weft fault detector is mounted.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES D. LANNING.

Witnesses:

ARTHUR E. CARSON,
IRVING U. TOWNSEND.