

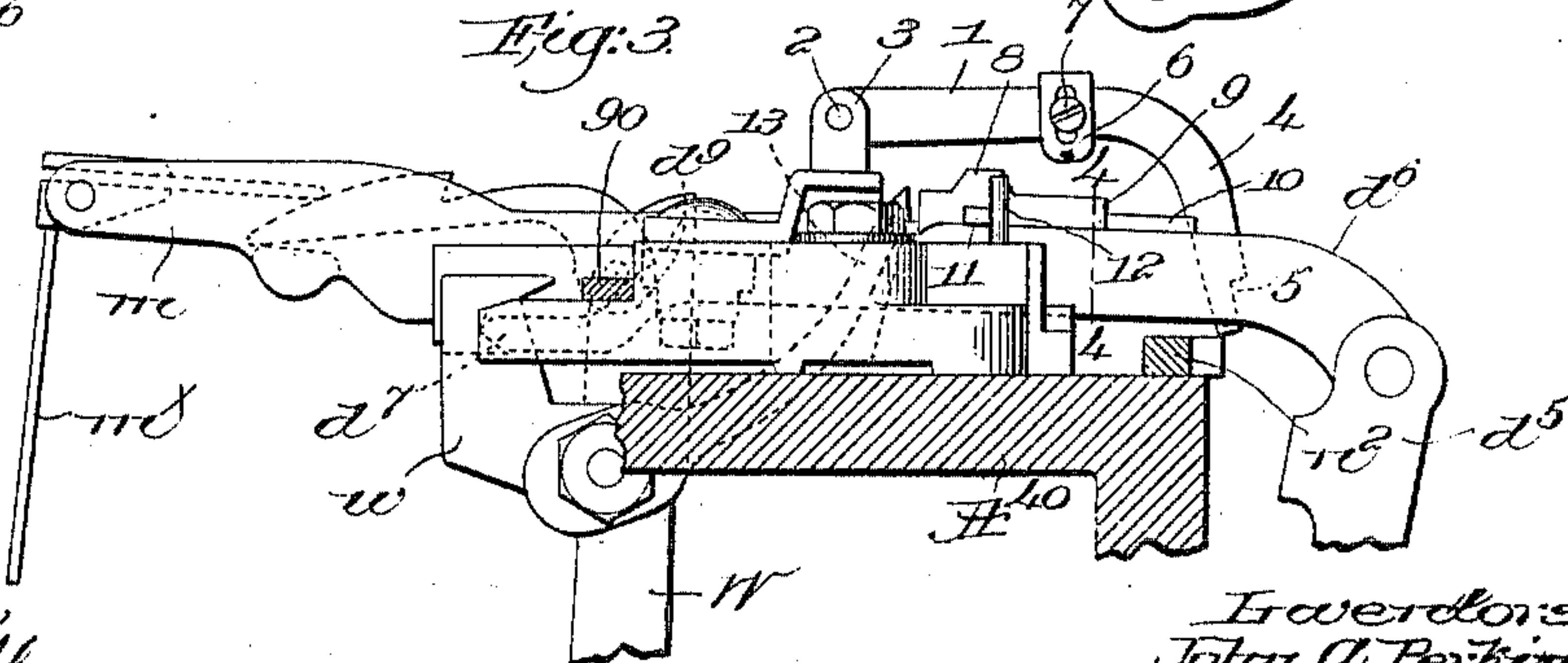
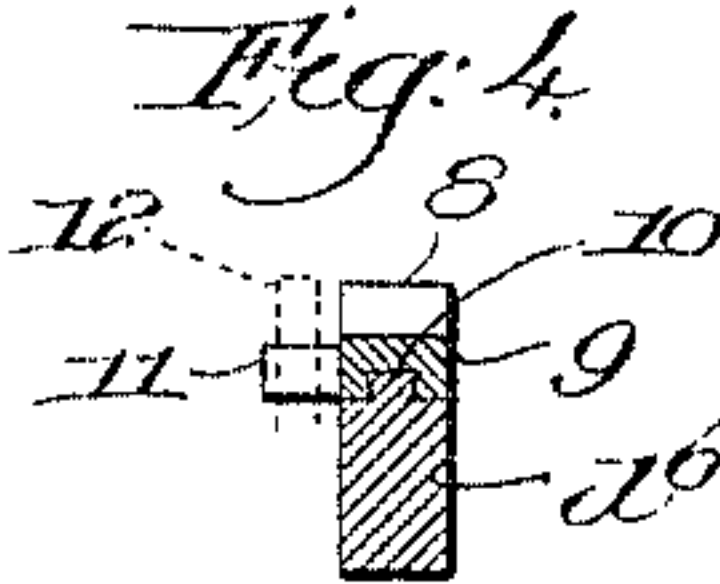
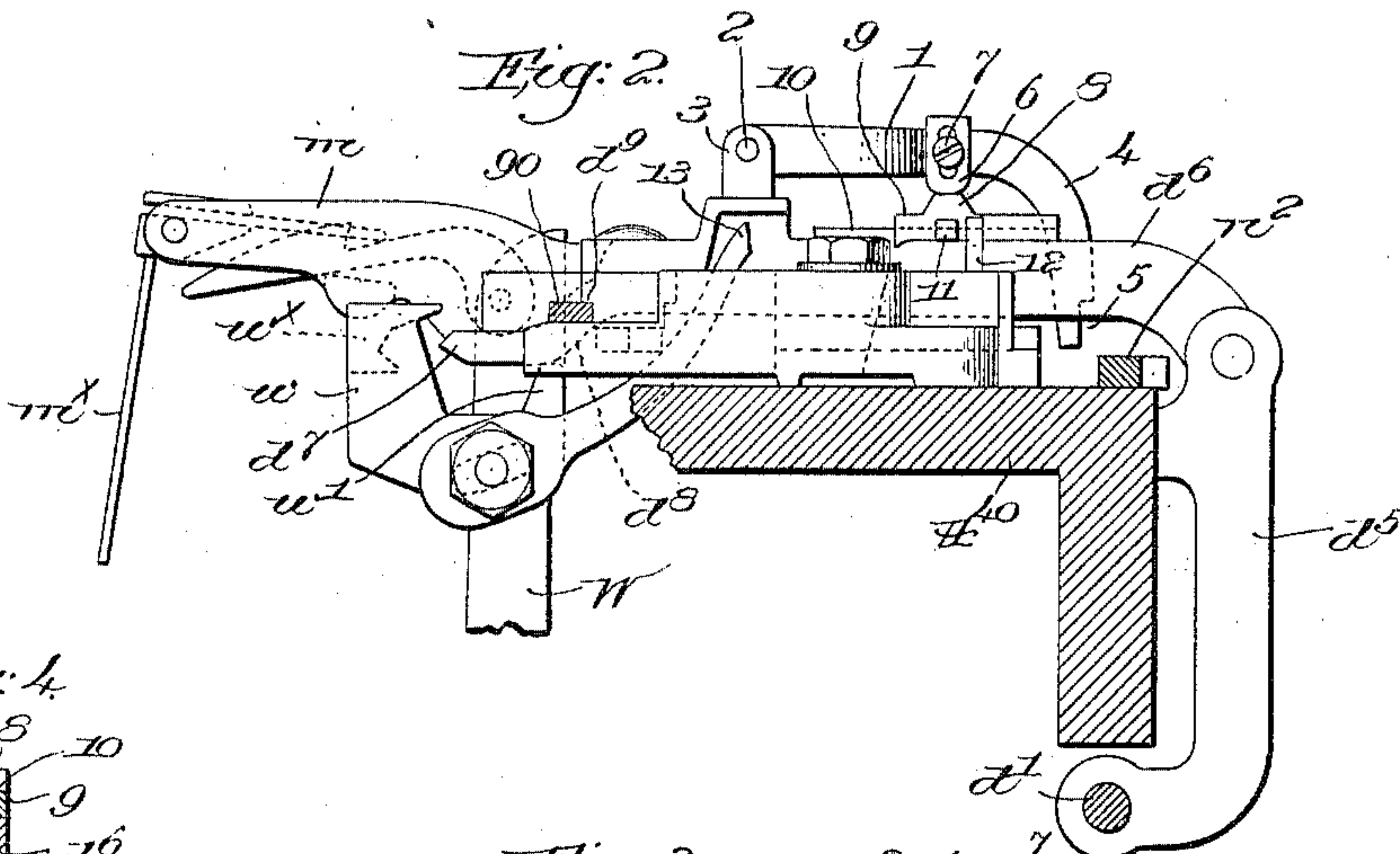
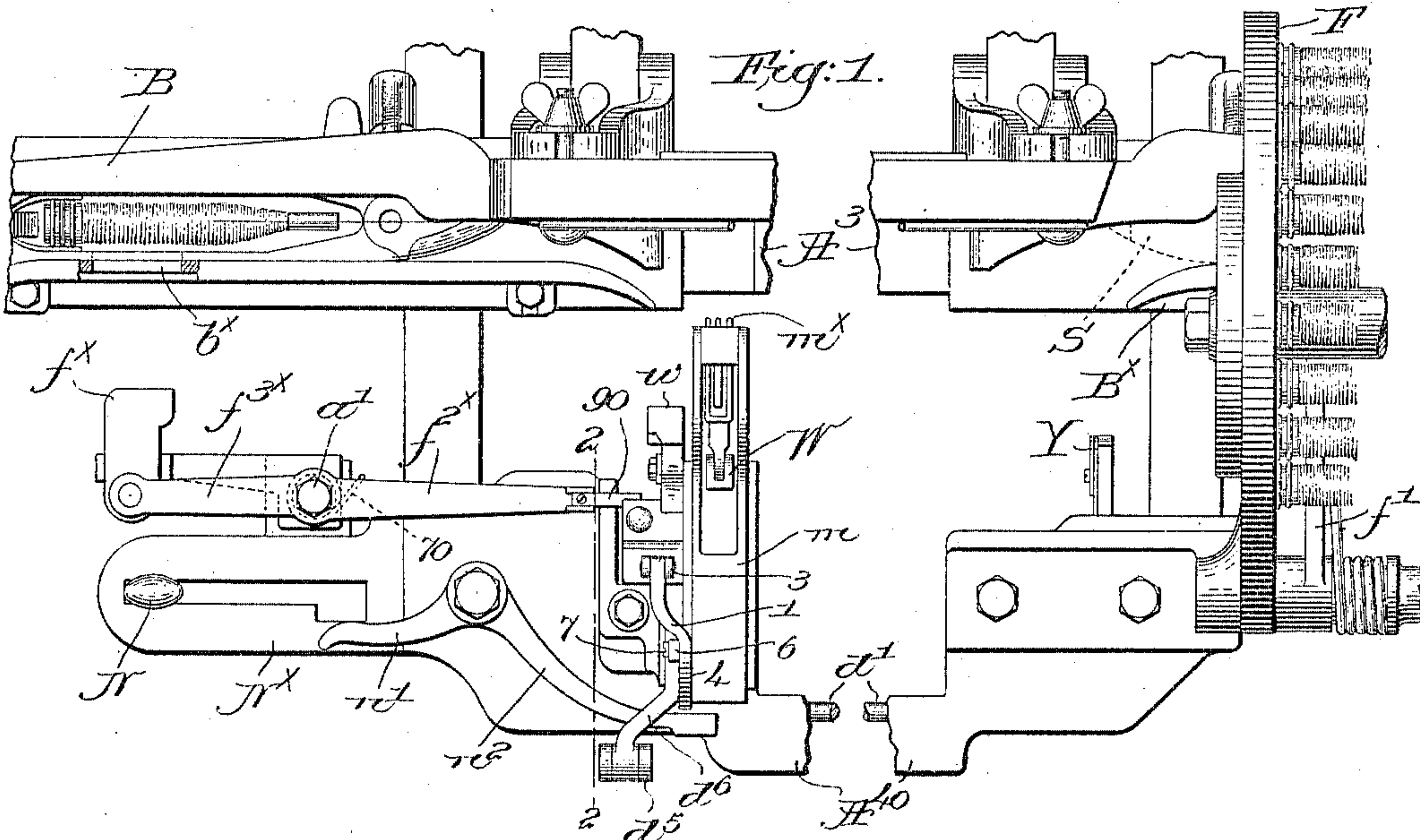
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PATENTED APR. 10, 1906.

J. A. PERKINS & A. A. ST. LAURENT.

## FEELER STOP MOTION FOR AUTOMATIC LOOMS.

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# UNITED STATES PATENT OFFICE.

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## FEELER STOP-MOTION FOR AUTOMATIC LOOMS.

No. 817,445.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed July 20, 1905. Serial No. 270,497.

*To all whom it may concern:*

Be it known that we, JOHN A. PERKINS and AIME A. ST. LAURENT, citizens of the United States, and residents of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Feeler Stop-Motions for Automatic Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

Looms provided with filling-exhaustion-indicating means are frequently termed "feeler-loom," for the reason that a feeler is provided to intermittingly engage the filling in the running shuttle, and when a predetermined exhaustion of the filling is attained the feeler causes the operation of an instrumentality which usually is arranged to effect automatically a change or replenishment of filling. When the feeler detects the proper degree of filling exhaustion, a filling-replenishing mechanism is thereupon set or positioned for operation on the next forward beat of the lay provided the shuttle is properly boxed at the replenishing side of the loom. A shuttle-feeler is generally provided to prevent the operation of the replenishing mechanism if the shuttle is not properly boxed, and as such shuttle-feelers frequently carry a thread-cutting device to sever the old thread between the cloth and the shuttle the thread may be cut when the shuttle-feeler engages the improperly-boxed shuttle. In such case the shuttle containing the old filling-carrier might be picked to the non-replenishing box, laying no filling, the feeler would again detect substantial exhaustion of filling, and the shuttle would return to the replenishing-box, and if then properly boxed the replenishing mechanism would operate, but two empty picks would occur, and a thin place in the cloth would result. Of course the usual protector mechanism would operate if the shuttle should be far enough out of the replenishing-box; but often in practice the shuttle-feeler can engage the shuttle and prevent filling-replenishing when the shuttle is not so far out but that it will be thrown across on the next pick, with the result above stated. Even should the thread-cutter fail to cut the filling-thread as above described

there might not be enough filling remaining in the shuttle to lay two picks, and a thin place would be made in the cloth before filling replenishment could be effected. In both of the cases noted it will be manifest that the loom should be stopped on the second successive detection of filling exhaustion by the feeler, for then the attendant has at most only two faulty picks to correct.

The present invention accordingly relates to feeler-loom; and it has for its object the production of means whereby stoppage of the loom will be effected automatically by or through two successive detections by the feeler of substantial exhaustion of filling in the running shuttle.

The various novel features of the invention will be fully described in the subjoined specification, and particularly pointed out in the following claims.

Figure 1 is a top plan view, broken out centrally and at the sides, of a sufficient portion of an automatic feeler-loom to be understood, with one embodiment of the present invention applied thereto. Fig. 2 is an enlarged transverse sectional detail on the line 2 2, Fig. 1, looking toward the right with the parts in normal position. Fig. 3 is a similar view, but showing the change in relative position of some of the parts when two successive detections have been made by the feeler; and Fig. 4 is a sectional detail on the line 4 4, Fig. 3.

Referring to Fig. 1, the breast-beam  $A^{40}$ , lay  $A^3$ , having a non-replenishing shuttle-box B, its front wall having a feeler-opening  $b^x$ , the shipper N, its notched holding-plate  $N^x$ , and the knock-off lever  $n' n^2$  to release the shipper, and thereby effect the stoppage of the loom by a suitable instrumentality, (not shown,) and the filling-replenishing mechanism, partly shown at the right, Fig. 1, and comprising the hopper F, transferrer  $f'$ , and controlling rock-shaft  $d'$ , may be and are all substantially as in United States Patent No. 677,607, dated July 2, 1901. So, too, the feeler-arm  $f^{2x} f^{3x}$ , fulcrumed at  $a'$  and having a wear-plate 90, the feeler proper,  $f^x$ , to intermittingly pass through the opening  $b^x$  in the front wall of the shuttle-box B and enter the shuttle through a slot in its side to periodically engage and be moved by the fill-



ing in the running shuttle until such filling is substantially exhausted are substantially as in said patent.

The filling-fork  $m^x$ , its slide  $m$ , and the weft-hammer  $W$ , adapted to cooperate in usual manner with the fork-tail and move the slide outward upon detection of failure of filling to operate the knock-off lever  $n'$   $n^2$ , and thereby release the shipper, are all of usual construction.

An upturned arm  $d^5$ , fast on the rock-shaft  $d'$ , has pivotally connected with it the outer end of a latch  $d^6$ , whose rear end  $d^7$  is adapted to at times be engaged by a bunter  $w^x$  (see Figs. 2 and 3) on the head  $w$  of the weft-hammer at one side of the guide for the fork-slide  $m$ , a projection  $w'$  on the head  $w$  cooperating intermittingly with a cam-face  $d^8$  on the latch; and the plate 90 is moved beneath the overhanging shoulder  $d^9$  on the latch by a spring 70 to maintain the latch end  $d^7$  in the path of the bunter  $w^x$ , all in a manner familiar to those skilled in the art. Filling-induced movement of feeler  $f^x$  withdraws plate 90, and the latch end  $d^7$  drops below the bunter-path as the weft-hammer swings forward, and on its backward swing the projection  $w'$  cooperates with cam-face  $d^8$  and lifts the latch to permit the plate 90 to again pass under the shoulder  $d^9$ , all substantially as in United States Patent No. 720,209, dated February 10, 1903. When the filling in the shuttle is exhausted to a predetermined extent, the feeler will not be moved sufficiently to withdraw the plate 90 from the latch-shoulder and the latch  $d^6$  will be moved outward by the weft-hammer, and through the rock-shaft  $d'$  the replenishing mechanism is set or positioned in readiness to be operated on the next forward beat of the lay, provided the shuttle is properly boxed in the shuttle-box  $B^x$  at the replenishing side of the loom. As shown in Fig. 1, a portion of a shuttle-feeler  $Y$  is arranged to prevent the operation of the replenishing mechanism if the shuttle should be slightly out of the replenishing-box  $B^x$ , as at  $S$ , (see dotted lines, Fig. 1,) and in practice the shuttle-feeler is frequently provided with a device to cut or part the old filling-thread between the cloth and the shuttle at time of filling replenishment.

In accordance with the present invention a dog 1 is fulcrumed at 2 on ears 3, upturned on the latch  $d^6$ , the front end of the dog being downturned at 4 and preferably notched, as at 5, Figs. 2 and 3, to at times cooperate with the arm  $n^2$  of the knock-off lever. A rest 6 is adjustably secured on the dog by a set-screw 7 and projects beneath it to normally engage and rest upon a cam 8, formed on a slide 9, mounted on an undercut rib 10, longitudinally extended on the top of the latch  $d^6$ , (see Fig. 4,) the slide 9 having a lateral lug 11 to at times engage an upright fixed pin or stud 12, as will be explained. A setting-finger 13

is also secured to the weft-hammer, the upper end of the finger being arranged to set the slide 9 if the operation of the filling-replenishing mechanism is effected after the first indication by the feeler that the running filling is exhausted to a predetermined point. Under normal conditions the cam 8 supports the rest 6, as in Fig. 2, and the outer depending end 4 of the dog is held up so as to clear the knock-off-lever arm  $n^2$  if the latch  $d^6$  is moved forward, as it will be when substantial filling exhaustion is indicated by the feeler. As the latch is then moved forward it carries with it the slide 9 until the lug 11 hits the pin 12, stopping the slide, while the continued forward movement of the latch carries the rest 6 away from the cam 8, permitting the dog to drop, so that its end 4 will rest upon the knock-off arm  $n^2$ , as shown in Fig. 3. The arm  $d^5$  also turns the rock-shaft  $d'$ , and the replenishing mechanism is set or positioned in readiness to operate, and if the shuttle is properly boxed in box  $B^x$  the filling will be changed or replenished, and as the latch returns to normal position it will carry with it the slide 9, the end 4 of the dog dropping behind the knock-off lever. On the following forward swing of the weft-hammer the setting-finger 13 engages the rear end of the slide 9 and pushes it forward along the latch until the cam 8 engages the rest 6 and lifts it and the dog 1 to normal position, Fig. 2, the parts then being set in readiness for another operation when required. If, however, after the first outward movement of the latch the replenishing mechanism should not operate—as, for instance, because of engagement of the shuttle by the shuttle-feeler  $Y$ —the shuttle would probably be picked across to box  $B$  and the feeler  $f^x$  would again indicate filling exhaustion. The latch  $d^6$  having moved inward would be moved outward a second time, owing to the two successive indications of the feeler, and the notched part 5 of the dog then being behind and engaging the arm  $n^2$  the second outward movement of the latch will turn the knock-off lever and release the shipper to effect stoppage of the loom. After the fault has been corrected by the weaver and the loom started the cam 8 and rest 6 are again caused to cooperate, as before described, and the parts are then restored to normal condition. It will thus be seen that if predetermined filling exhaustion is indicated twice in succession by the feeler the loom will be stopped automatically, so that a feeler knock-off is thereby provided and the production of thin places in the cloth from the causes referred to is prevented.

The invention is not restricted to the particular construction and arrangement herein shown and described, for various changes or modifications may be made by those skilled in the art without departing from the spirit and scope of the invention herein disclosed.



Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a loom provided with automatic filling-replenishing mechanism, in combination, a feeler to intermittingly engage the filling in the running shuttle, means controlled by said feeler to normally effect the operation of said mechanism when the filling has been substantially exhausted, and means adapted to effect the actuation of a stopping instrumentality upon two successive indications of filling exhaustion by the feeler without filling replenishment.

2. In a loom, mechanism to indicate predetermined exhaustion of the filling in the running shuttle, a shipper, a releasing device therefor, and means to operate said device by or through two successive indications of filling exhaustion by said mechanism.

3. In a loom, mechanism to indicate predetermined exhaustion of the filling in the running shuttle, said mechanism including a feeler to intermittingly engage the filling in the shuttle, a shipper, and means to effect release thereof by or through two successive indications of the feeler of substantial exhaustion of the filling.

4. In a loom, filling-exhaustion-indicating mechanism to indicate predetermined exhaustion of the running filling, and means adapted to effect the operation of a stopping instrumentality by or through two successive indications of said mechanism.

5. In a loom, mechanism to indicate predetermined exhaustion of the filling in the running shuttle, said mechanism including a feeler to intermittingly engage and be moved by the filling in the running shuttle until substantial exhaustion of such filling, and means adapted to effect the operation of a stopping instrumentality by or through two successive indications of filling exhaustion by the feeler.

6. In a loom provided with automatic filling-replenishing mechanism, in combination, a feeler to intermittingly engage the filling in the running shuttle, means controlled by said feeler to normally effect the operation of said mechanism when the filling has been substantially exhausted, means to prevent the operation of the replenishing mechanism when the shuttle is improperly positioned, a shipper, and means to effect release thereof by or through a second indication of filling exhaustion by the feeler following failure of the replenishing mechanism to operate.

7. In a loom provided with automatic filling-replenishing mechanism, means, including a feeler to intermittingly engage the filling in the shuttle, to normally cause the op-

eration of said mechanism upon substantial exhaustion of the running filling, a shipper, a releasing device therefor, and means to effect the operation of said device upon a double detection of substantial exhaustion of filling by said feeler after failure of the replenishing mechanism to operate.

8. In a loom provided with automatic filling-replenishing mechanism, means, including a feeler to intermittingly engage the filling in the shuttle, to normally cause the operation of said mechanism upon substantial exhaustion of the running filling, a shuttle to contain a supply of filling, a shuttle-feeler to prevent filling replenishment when the shuttle is improperly positioned therefor, and means adapted to effect the operation of a stopping instrumentality by or through a double detecting action of the filling-feeler upon prevention of filling replenishment.

9. In a loom, filling-exhaustion-indicating mechanism, including a feeler to intermittingly engage the filling in the running shuttle, a shipper, a knock-off lever therefor, a latch operatively moved by or through the feeler upon detection of substantial exhaustion of filling, a dog carried by said latch, and means to cause the dog to cooperate with and move the knock-off lever to release the shipper upon two successive detections by the feeler that the filling is substantially exhausted.

10. In a loom, filling-exhaustion-indicating mechanism, including a feeler intermittingly engaged and moved by the filling in the running shuttle until substantial exhaustion of such filling, a shuttle to contain a supply of filling, a shipper, and means to effect release thereof by or through two successive indications of the feeler that the same filling-supply is substantially exhausted.

11. In a loom, filling-exhaustion-indicating mechanism, including a feeler to engage the filling in the running shuttle on alternate picks, filling-replenishing mechanism adapted to operate upon substantial filling exhaustion when detected by the feeler, a shipper, and means to effect release thereof by or through detection of filling exhaustion by the said feeler on two successive detecting-picks.

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

JOHN A. PERKINS.  
AIME A. ST. LAURENT.

Witnesses:

HENRY TADGELL,  
FREDERICK E. WARNER.