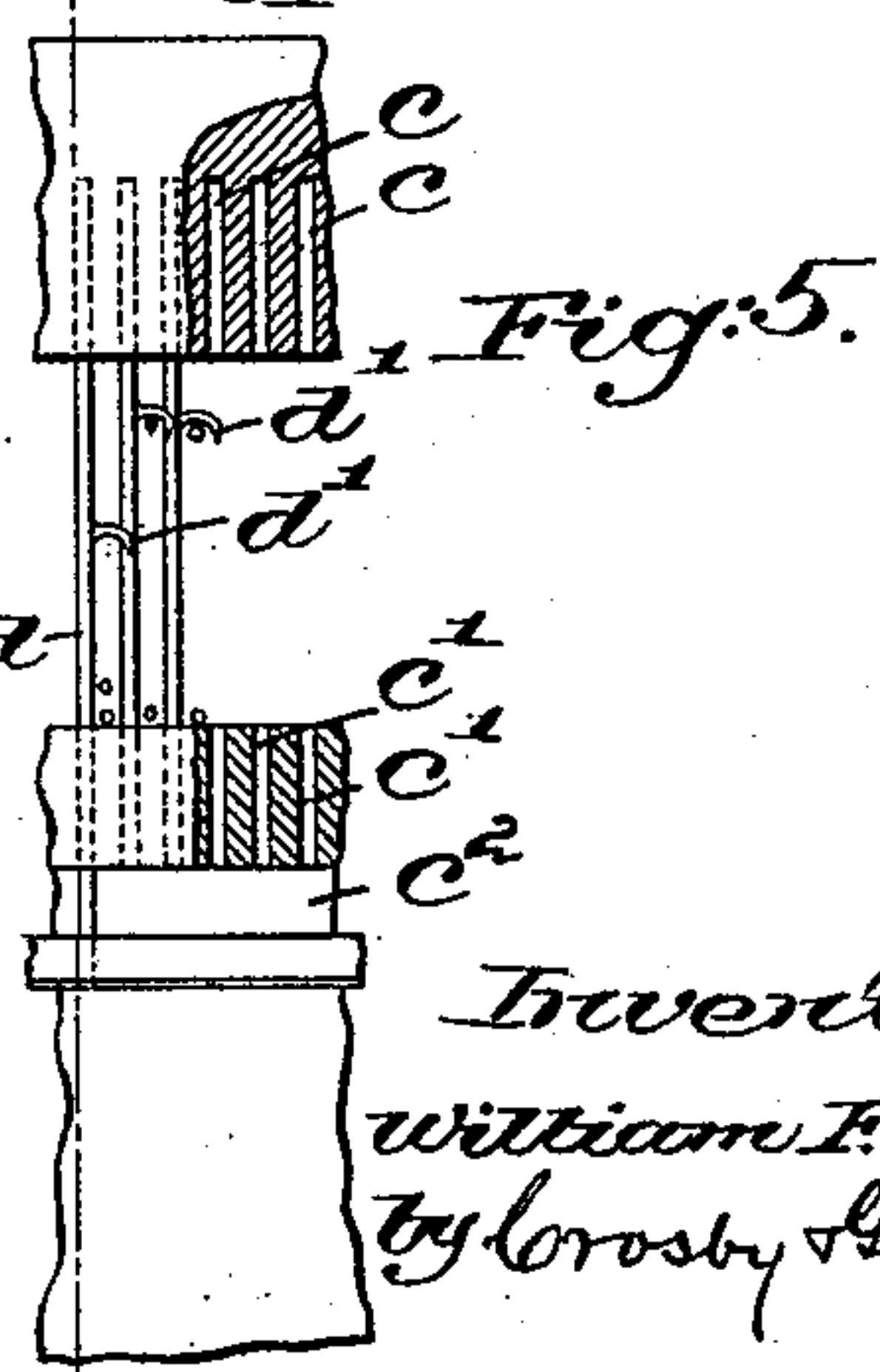
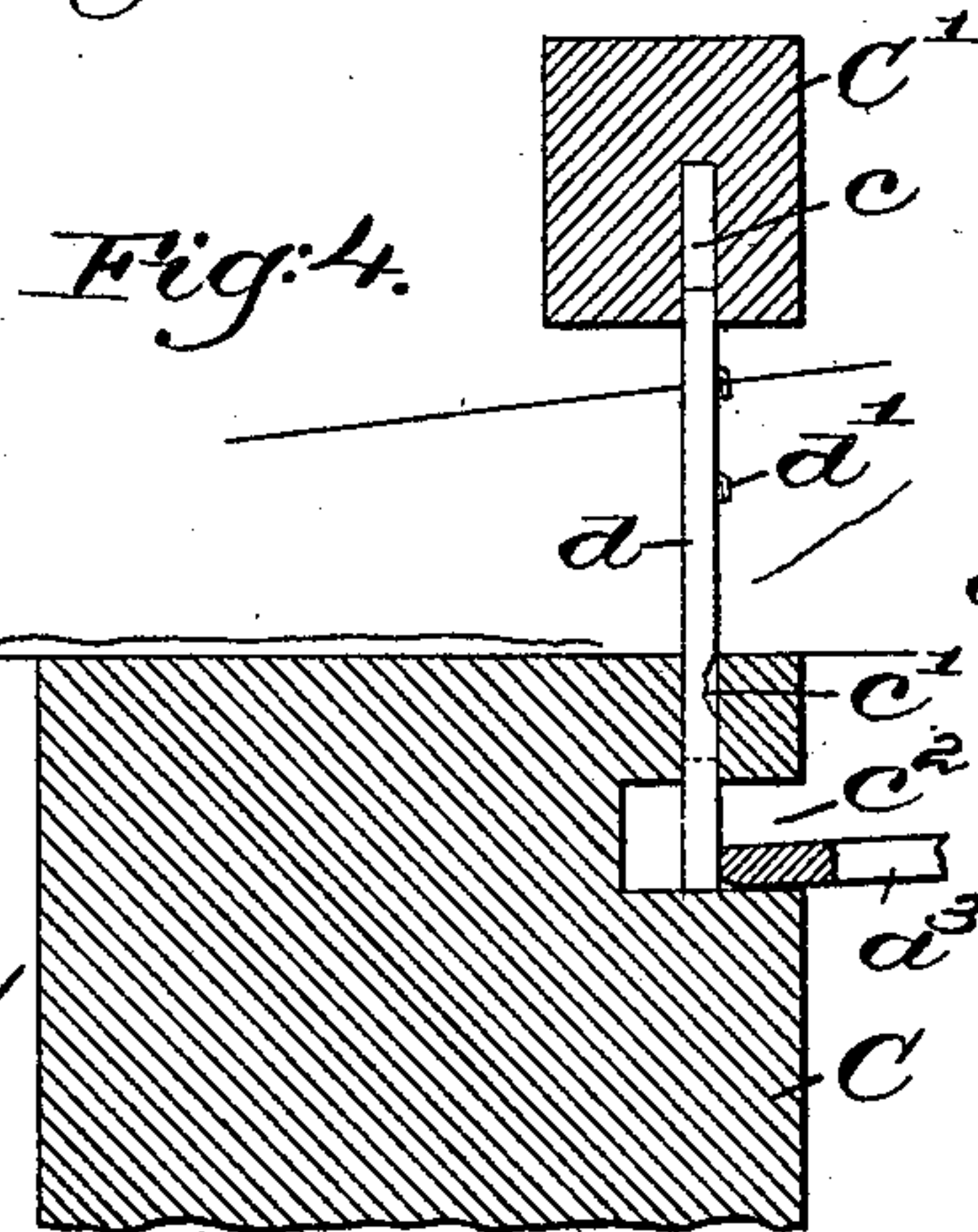
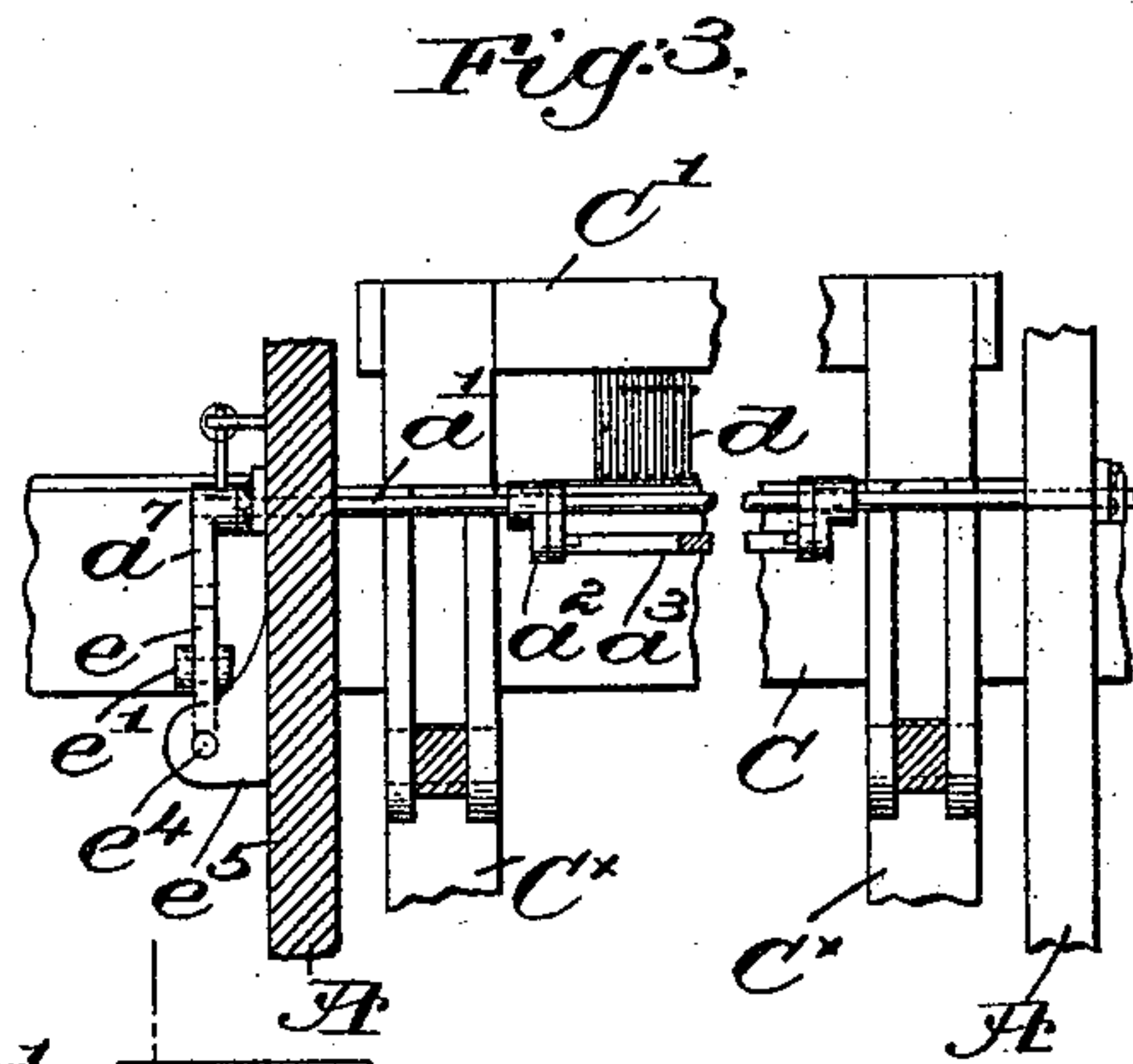
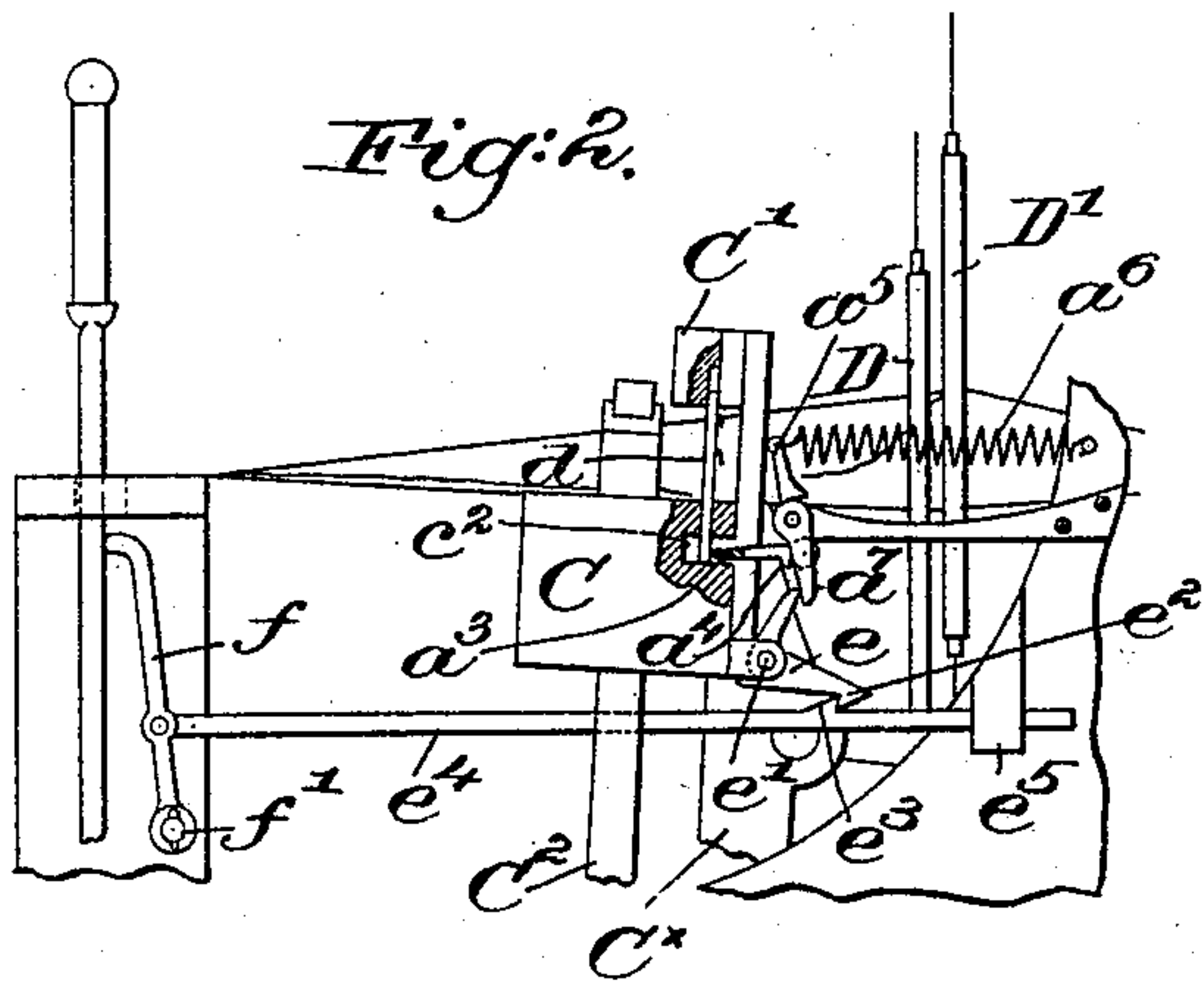
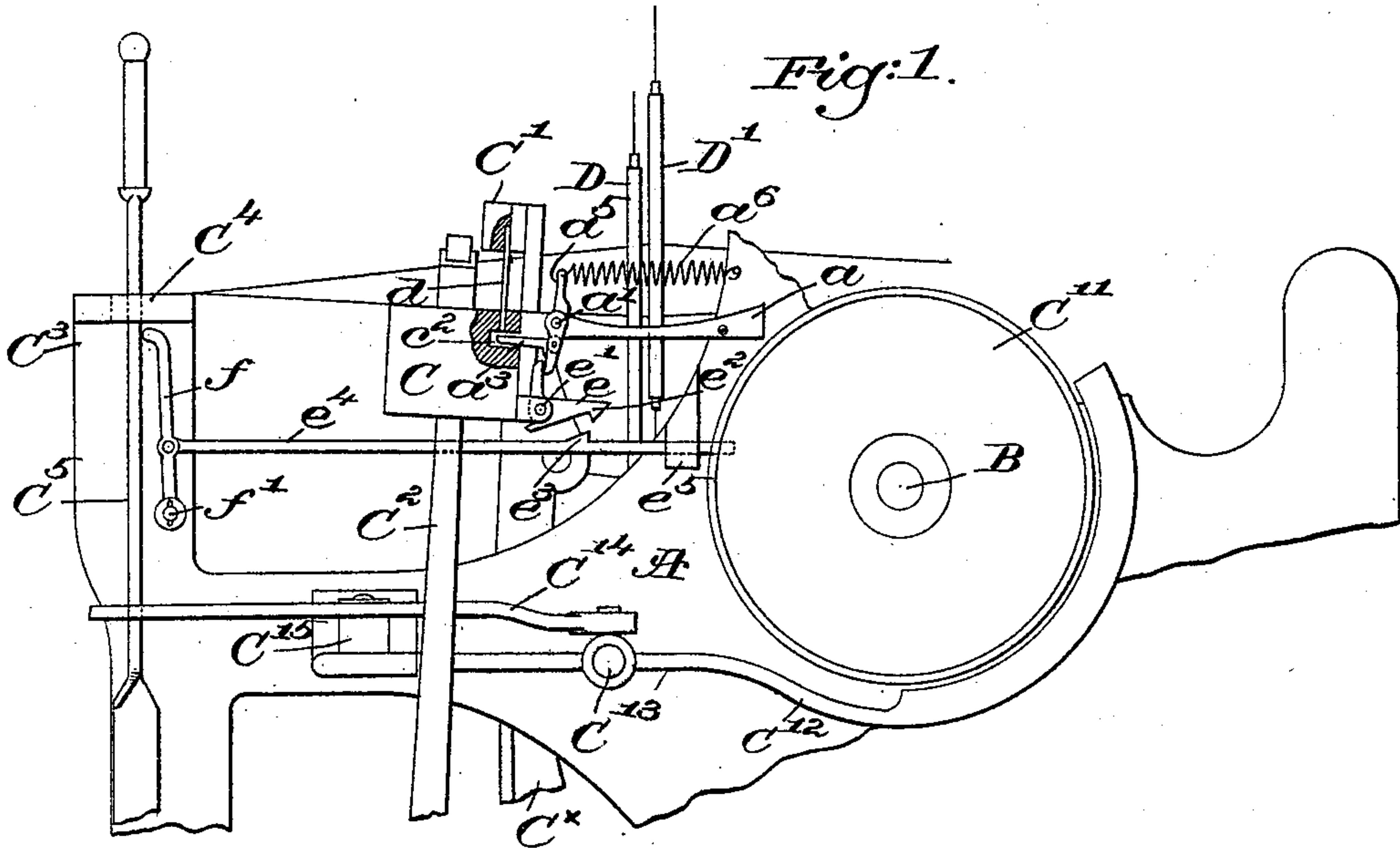


(No Model.)

W. F. DRAPER.
WARP STOP MOTION FOR LOOMS.

No. 496,353.

Patented Apr. 25, 1893.



Witnesses.
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UNITED STATES PATENT OFFICE.

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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 496,353, dated April 25, 1893.

Application filed February 21, 1893. Serial No. 463,212. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. DRAPER, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Warp 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 has for its object to provide a novel stop motion for looms.

The distinctive feature of this invention consists in making the reed dents longitudinally movable in their supports, and providing the said reed dents with hooks or supports whereby a part or all of them are moved longitudinally in their supports by the shedding of the warp threads.

Suitable mechanism to be described, is provided whereby a reed dent remaining unmoved by reason of a broken warp thread, effects the stopping of the loom.

Figure 1 represents in partial end elevation a loom embodying this invention; Fig. 2, a view showing the parts in a different position; Fig. 3, a side view of the parts shown in Fig. 2, looking from the right; Fig. 4, a vertical cross section of the lay, on an enlarged scale, showing the longitudinally movable reed dents in position, and Fig. 5, a right hand side view of Fig. 4, partially broken away.

Referring to the drawings, in the particular construction selected to illustrate this invention, A represents a portion of one of the end frames of a loom; B, the lay or crank shaft; C, the lay; C', the lay cap; C^x the lay sword; C² the picker stick; C³, the breast-beam; C⁴, a holding plate having a slot for the shipper C⁵ to move in, and a notch to hold the said shipper in position; C¹¹, a driving pulley on the shaft B; C¹², a belt controller mounted to slide on the rod C¹³ and actuated by the lever C¹⁴ pivoted at C¹⁵, and having its outer end in engagement with the shipper C⁵; and D and D' heddle frames, all of which may be of usual or desired construction, and operating in usual manner, and so need not be herein further described.

Referring particularly to Figs. 4 and 5, the lay C, and lay cap C', in accordance with the

present embodiment of this invention, are each formed to present a series of sockets or guide-ways *c, c'*, to receive and hold the several reed dents *d*, said reed dents being movable longitudinally in said guide-ways, the lay and lay cap constituting supports for the reed dents. The reed dents *d*, are each provided with a hook or warp support *d'*, which projects laterally, in the present instance, to the right, across the adjacent reed space, so that whenever an unbroken warp thread in such reed space is raised in shedding, said thread will act upon said hook and raise its reed dent from its lowermost normal into its uppermost abnormal position, as shown at the right in Fig. 5. If, however, a warp thread which should be raised becomes broken, it will fail to raise its reed dent as described, and will leave the same in its lowermost normal position to act through mechanism to be described to stop the loom. In the loom herein shown, each reed space contains at least two warp threads, one or more of which are raised at each pick of the loom so that all the reed dents during regular operation of the loom should be raised regularly at each pick of the loom. The lay C, at its rear side is shown as provided with a longitudinal groove or recess *c²* on the bottom of which the reed dents rest when in their normal lowermost positions.

The end frames A, see Fig. 1,—only one of which is shown,—each have a bracket *a* in which is journaled a shaft *a'*, provided between the brackets *a*, with depending arms *a²* to the ends of which is pivoted the feeler plate *a³*, extending substantially the entire length of the lay, and provided with ears *a⁴*, see Fig. 2, which act against the depending arms *a²*, and serve as stops to maintain the feeler plate always in a position substantially at right angles to the arms *a²*. The feeler is however, free to be turned on its pivots in the arms *a²* to a limited extent. The shaft *a'*, at one end, has an upwardly extended arm *a⁵* connected by a spring *a⁶* with the frame A, said spring acting to maintain the shaft *a'* with the arms normally in such position, that the feeler *a³* will enter the recess *c²* at each backward movement of the lay, as shown in Fig. 1. The shaft *a'* has fast upon its end

opposite the arm a^5 , a depending arm a^7 which normally stands in the path of movement of the upper end of a bell crank lever e , pivoted at e' , on the lay, the said lever e being turned
 5 back on its pivot by striking the depending arm a^7 at each backward movement of the lay. The bell crank lever e , at its lower end is provided with a hook e^2 , adapted, when the lever is in its lowermost position, to engage a
 10 projection e^3 on a slide rod e^4 , at one end carried in a bearing e^5 , and at its opposite end jointed to a lever f , pivoted at f' , and having its upper free end lying directly back of the shipper C^5 , sliding movement of the rod e^4 to
 15 the left causing the lever f to displace the shipper from its notch in the holding plate C^4 and thereby permit the shipper to move to stop the loom.

The operation of the stop-motion is as follows, viz:—So long as all the warp threads are perfect or unbroken, one or more threads in each reed space are raised at each pick of the loom, the threads so raised acting upon and raising the reed dents d into their elevated abnormal positions, with the lowermost ends raised entirely above or free from the recess c^2 in the lay, so that upon the backward movement of the lay, the feeler a^3 may enter the said recess to its full depth without
 25 moving the rod a' with its arms. Just before the lay reaches the end of its backward movement, the bell crank hook lever e strikes the depending arm a^7 on the shaft a' , and is turned back to raise its hooked end e^2 above and
 30 clear of the projection e^3 on the slide rod e^4 , so that as the lay begins its return or beating-in movement, the hook will pass over the said projection without engaging it, leaving the parts in their normal positions, the operation
 35 of the loom continuing in this manner so long as all the warp threads remain perfect or unbroken. If, however, a warp thread becomes broken so that it is not raised into the upper plane of the shed with the other or unbroken
 40 threads, the adjacent reed dent, which would have been raised by that thread had it remained unbroken will be permitted to remain in its normal lowermost position, Fig. 4, resting upon the bottom of the recess c^2 . When the lay
 45 with a reed dent in this position approaches the end of its backward movement, the feeler a^3 enters the recess c^2 as usual, but is immediately struck by the reed dent standing in the recess which prevents the feeler fully entering the recess and pushes the feeler back into its position Fig. 2, thereby turning the rod a' into its position Fig. 2, such movement of the rod carrying the depending arm a^7 back
 50 beyond the path of movement of the bell crank lever e , so that the latter is permitted to remain in its normal lowermost position to ride over and drop behind the projection e^3 on the rod e^4 , and upon the return or beating-in movement of the lay, pull the said
 55 slide bar to the left, as in Fig. 2, to disengage the shipper from its notch in the holding plate C^4 , and permit the shipper to move and

stop the loom. The broken warp thread having been mended, the loom is started and continues its operation, the warp threads raised
 60 at each formation of a shed, raising the reed dents so as to permit the feeler to fully enter the recess c^2 , until another warp thread breaks, when the loom will be again stopped in the manner described. 75

This invention is not restricted to the particular construction herein shown and described to illustrate this invention for the same may be varied without departing from the spirit and scope of the invention, the gist
 80 of which lies in longitudinally movable reed dents between which the warp threads are passed in combination with mechanism controlled thereby to effect the stopping of a loom. 85

I claim—

1. A warp stop motion for looms, containing the following instrumentalities, viz;—a series of longitudinally movable reed dents between which the warp threads are passed, hooks on
 90 said reed dents whereby the latter are moved from their normal into their abnormal positions by the shedding of unbroken warp threads, and stopping mechanism for the loom actuated by a reed dent in its normal position, substantially as described. 95

2. A warp stop motion for looms, containing the following instrumentalities, viz;—a lay, a series of longitudinally movable reed dents thereon, between which the warp threads are
 100 passed, hooks on said reed dents whereby the latter are moved from their normal into their abnormal positions by the shedding of the unbroken warp threads, and stopping mechanism for the loom actuated by a reed dent in its normal position, substantially as described. 105

3. A warp stop motion for looms, containing the following instrumentalities, viz;—a series of longitudinally movable reed dents, supports therefor, hooks on said reed dents whereby the latter are moved from their normal
 110 into their abnormal positions by the shedding of the unbroken warp threads; a feeler movable automatically toward and from said reed dents and stopping mechanism for the loom controlled by said feeler, substantially as described. 115

4. A warp stop motion for looms, containing the following instrumentalities, viz;—a lay; devices mounted thereon adapted to be raised
 120 by the unbroken warp threads when the latter are raised in shedding; a co-operating feeler on the frame, and stopping mechanism for the loom controlled thereby, substantially as described. 125

5. A warp stop motion for looms, containing the following instrumentalities, viz;—a lay, longitudinally movable reed dents thereon; hooks in said reed dents whereby the latter
 130 are moved from their normal into their abnormal positions by the warp threads in shedding; a feeler on the frame to co-operate with said reed dents, and stopping mechanism for

the loom actuated by contact of the feeler with a reed dent in its normal position, substantially as described.

6. A warp stop motion for looms, containing the following instrumentalities, viz;—a lay; longitudinally movable reed dents thereon; hooks on said reed dents whereby the latter are moved from their normal into their abnormal positions by the warp threads in shedding; a yielding feeler on the frame adapted to be moved by a reed dent in its normal position; stopping mechanism for the loom; and an engaging connection controlled by said feeler to connect said stopping mechanism with and to be operated by said lay, substantially as described.

7. A warp stop motion for looms, containing the following instrumentalities, viz;—a lay; a series of longitudinally movable reed dents thereon having hooks whereby said reed dents

are moved from their normal into their abnormal positions by the unbroken warp threads in shedding; a feeler on the frame adapted to be moved by a reed dent in its normal position; a shipper; a slide bar to move the same; and a hook on the lay normally retained from engagement with said slide-bar by the feeler when the latter is in its normal position, but permitted to engage and move said slide-bar when the feeler is moved by a reed dent in its normal position, substantially as described.

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

WILLIAM F. DRAPER.

Witnesses:

E. D. BANCROFT,
C. E. LONGFELLOW.