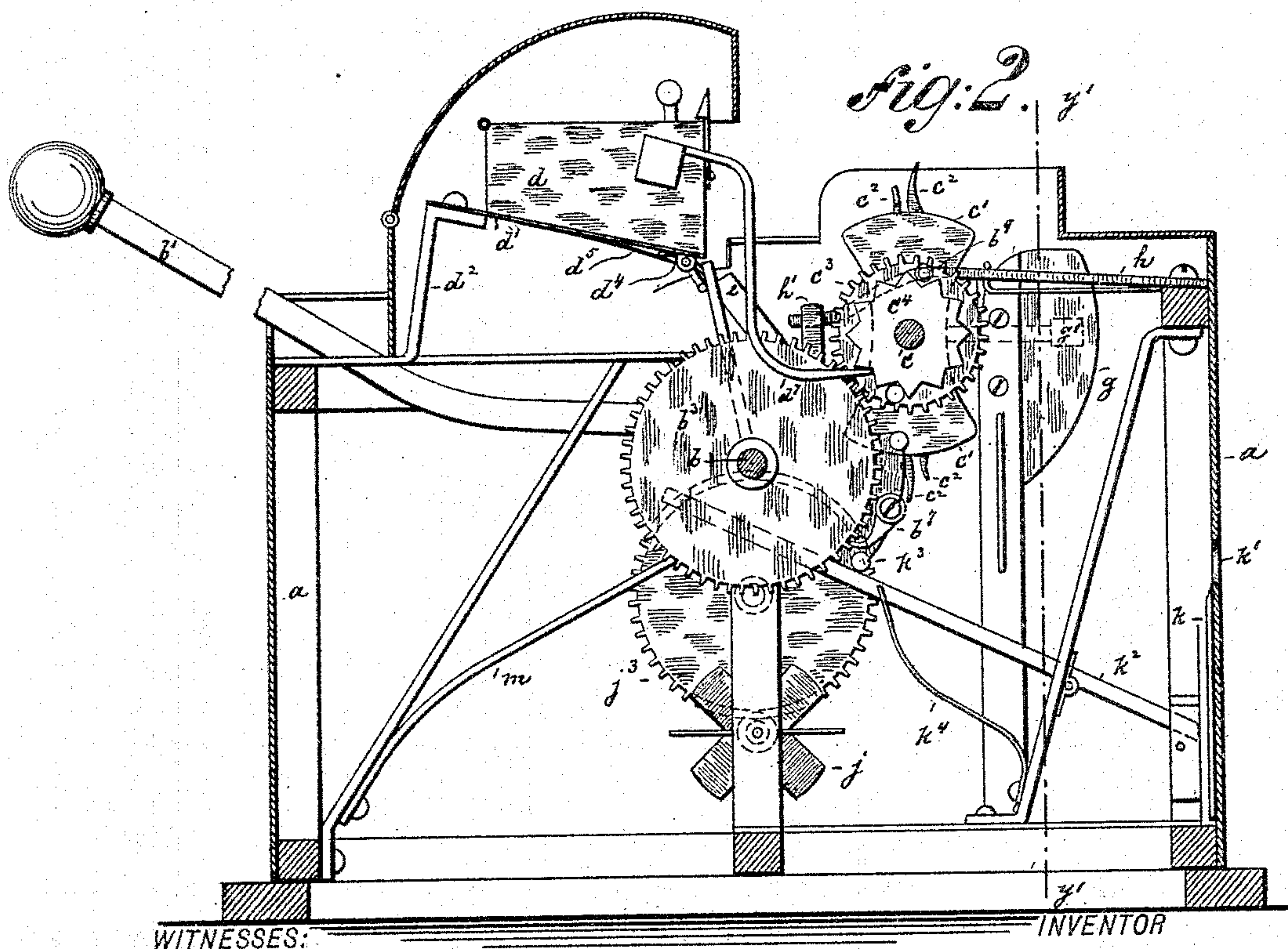
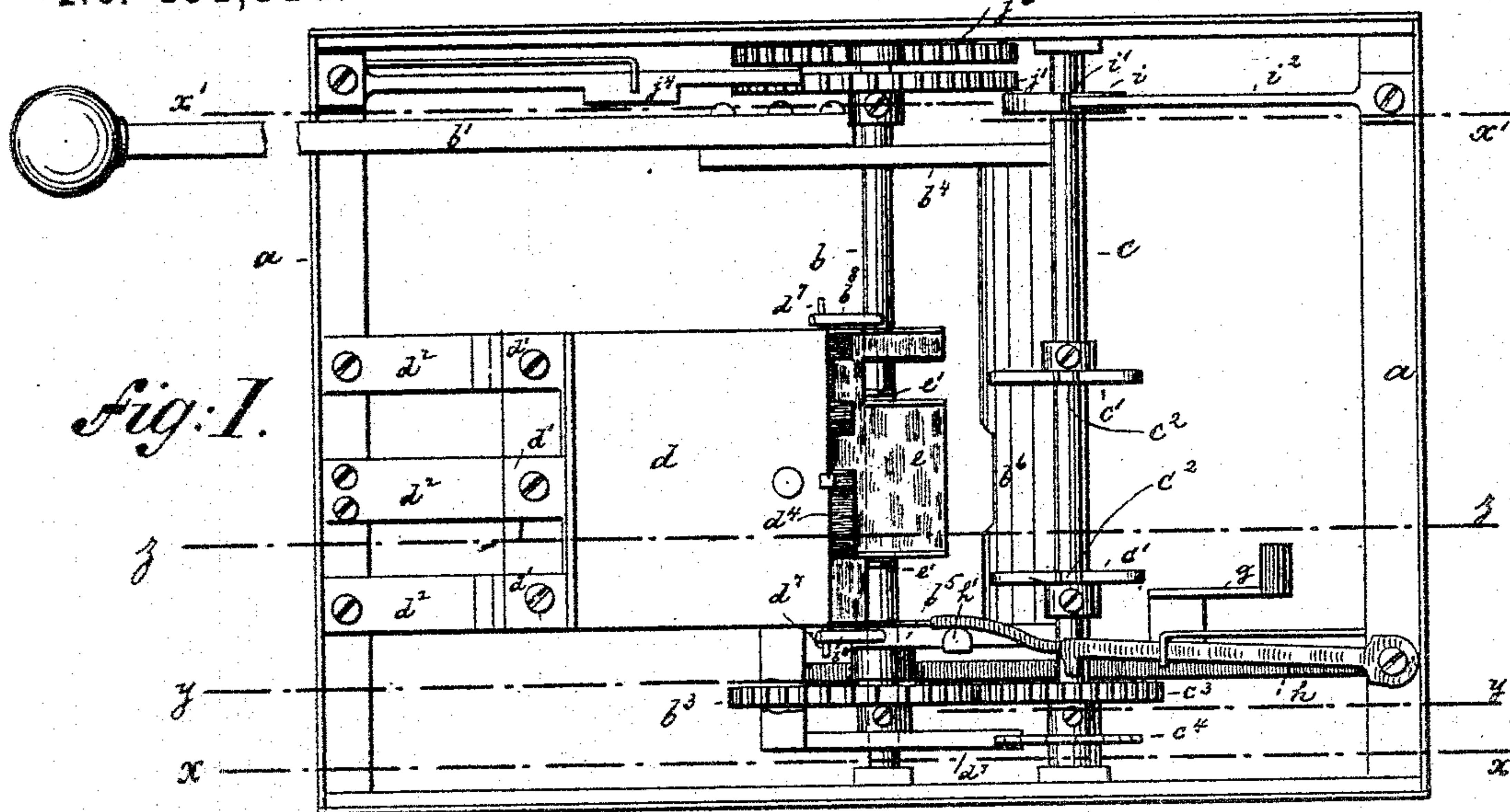


4 Sheets—Sheet 1.

No. 491,314.

Patented Feb. 7, 1893.



WITNESSES:

A. Schohl.
Wm. Schuck.

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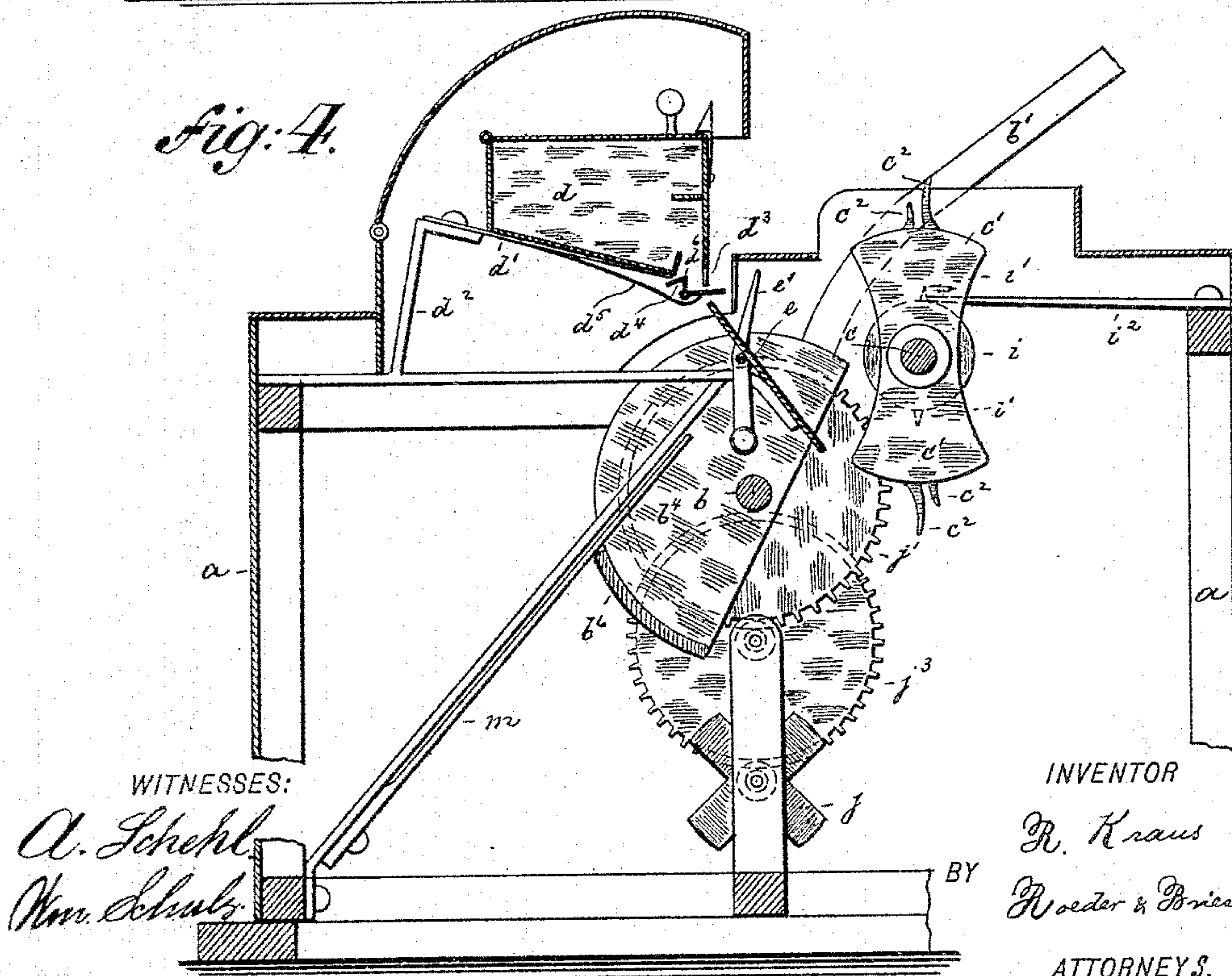
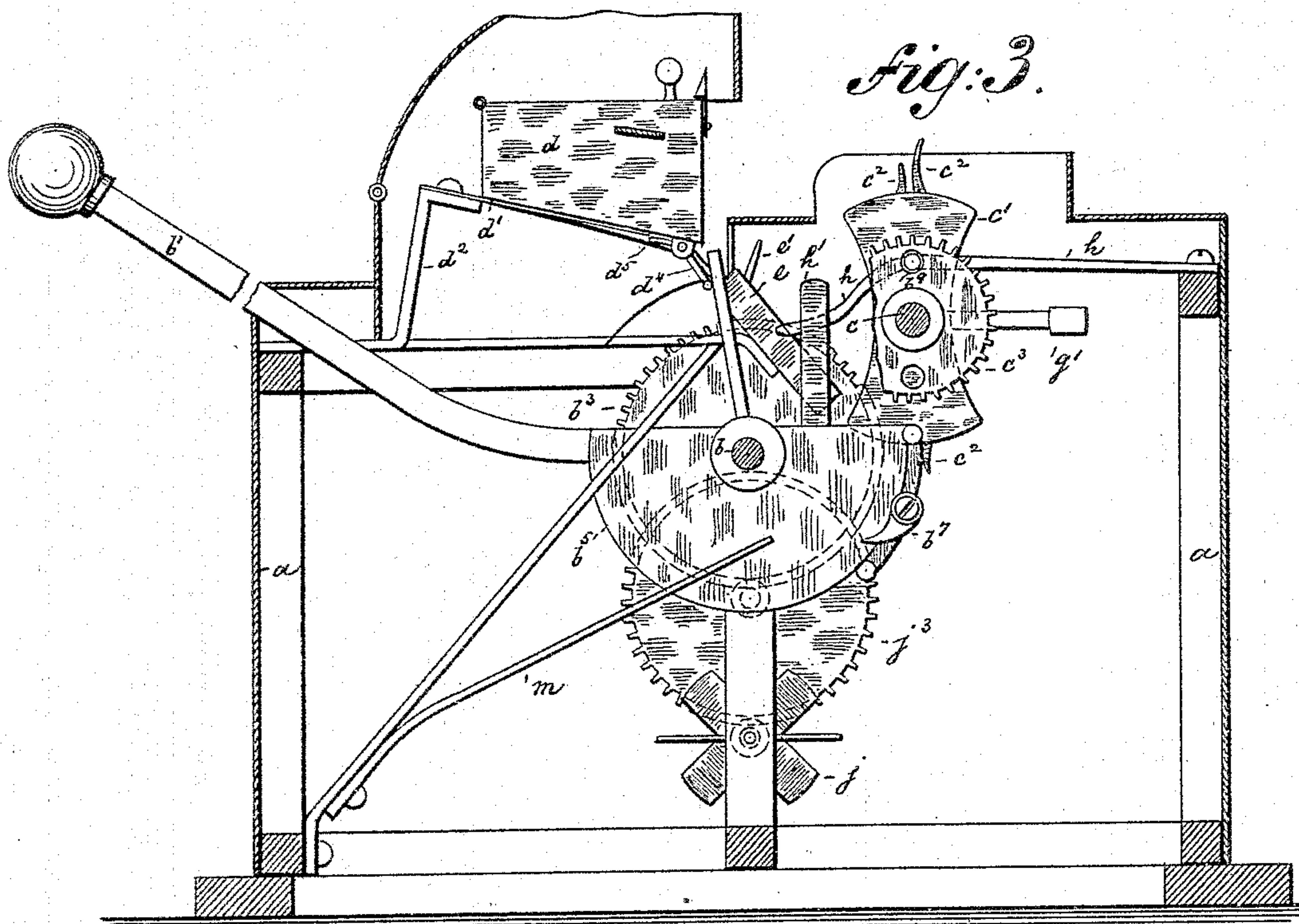
(No Model.)

4 Sheets—Sheet 2.

R. KRAUS.
AUTOMATIC MATCH LIGHTER.

No. 491,314.

Patented Feb. 7, 1893.



(No Model.)

4 Sheets—Sheet 3.

R. KRAUS.
AUTOMATIC MATCH LIGHTER.

No. 491,314.

Patented Feb. 7, 1893.

Fig. 5.

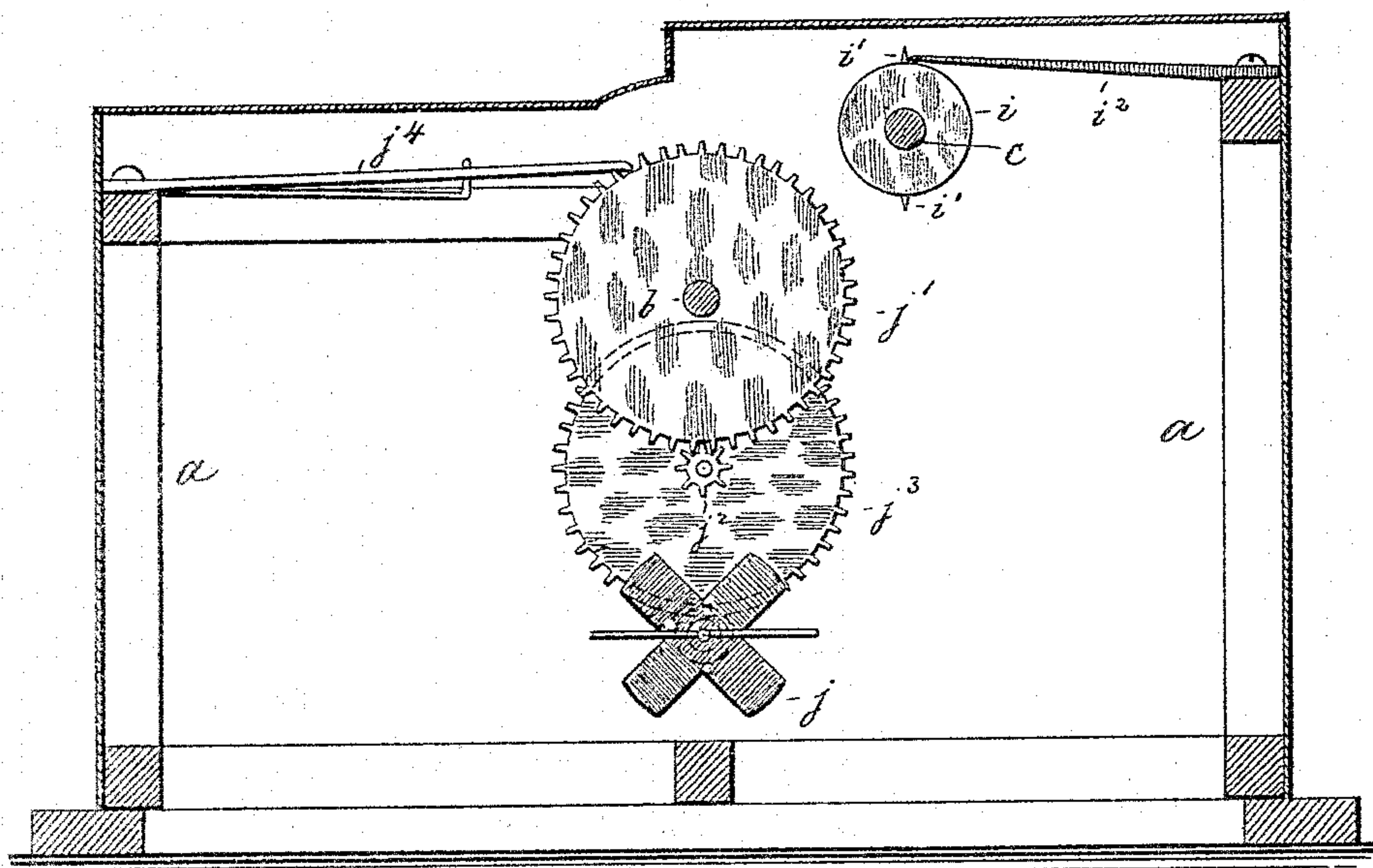
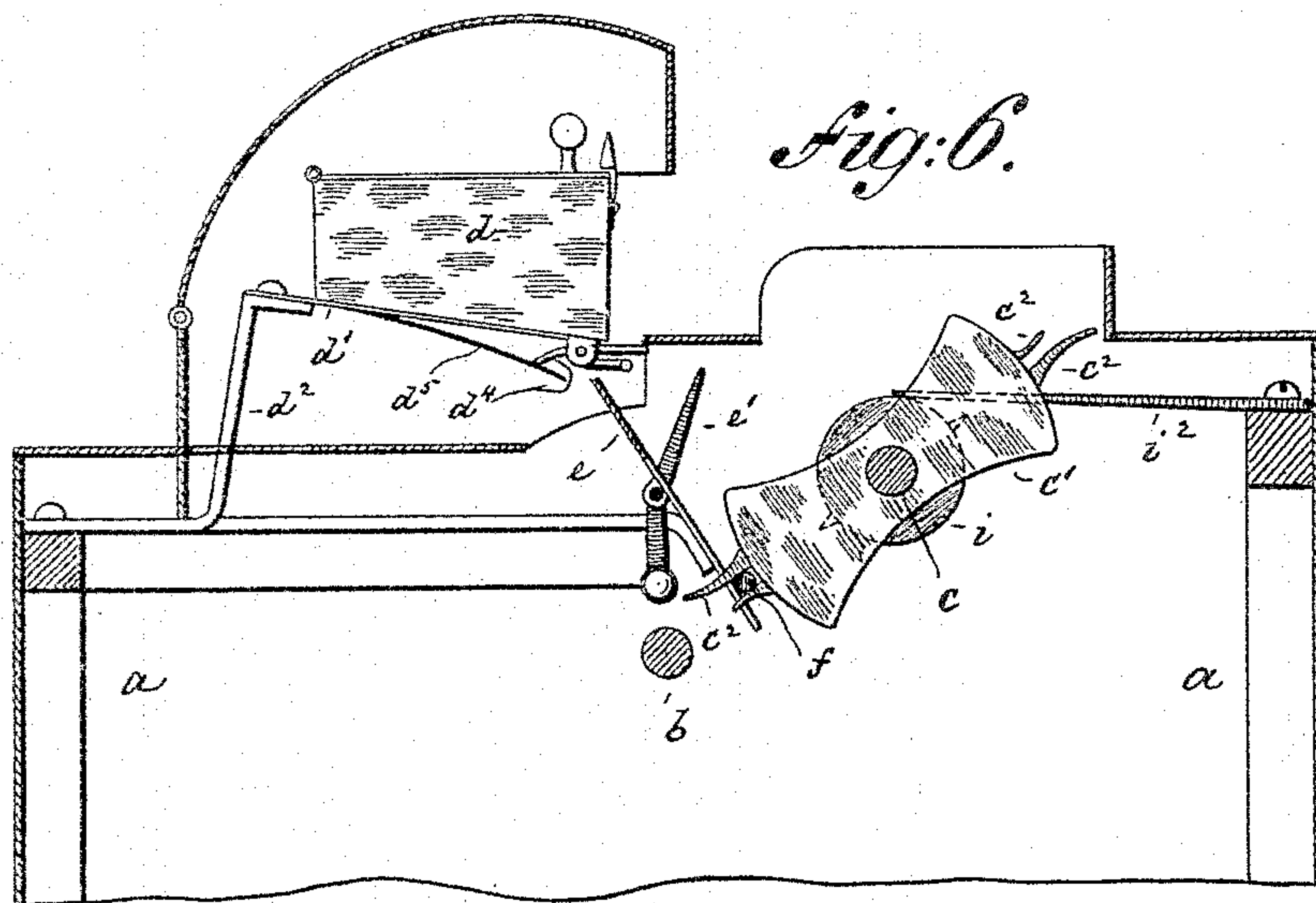


Fig. 6.



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4 Sheets—Sheet 4.

No. 491,314.

Patented Feb. 7, 1893.

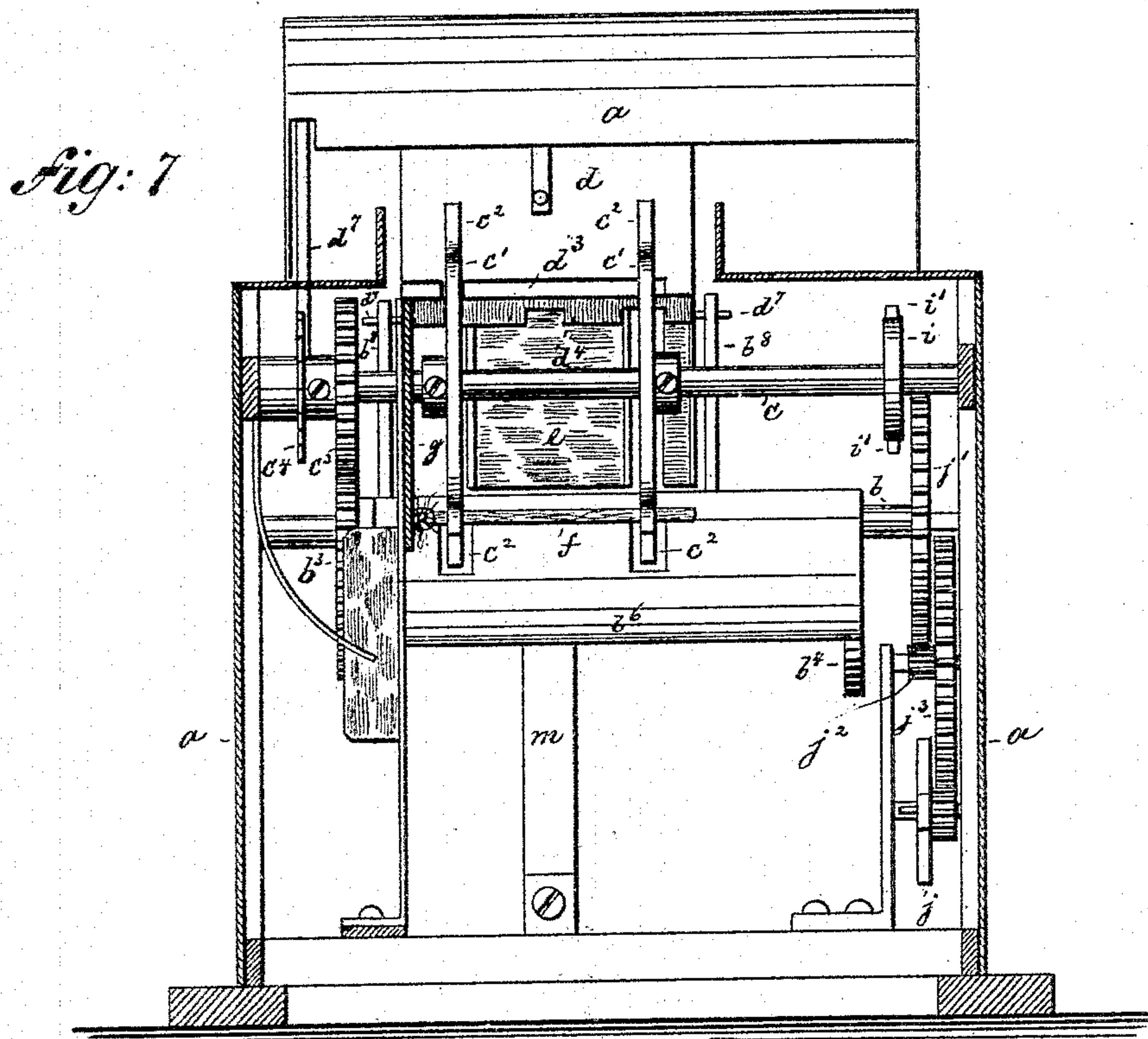


Fig: 8

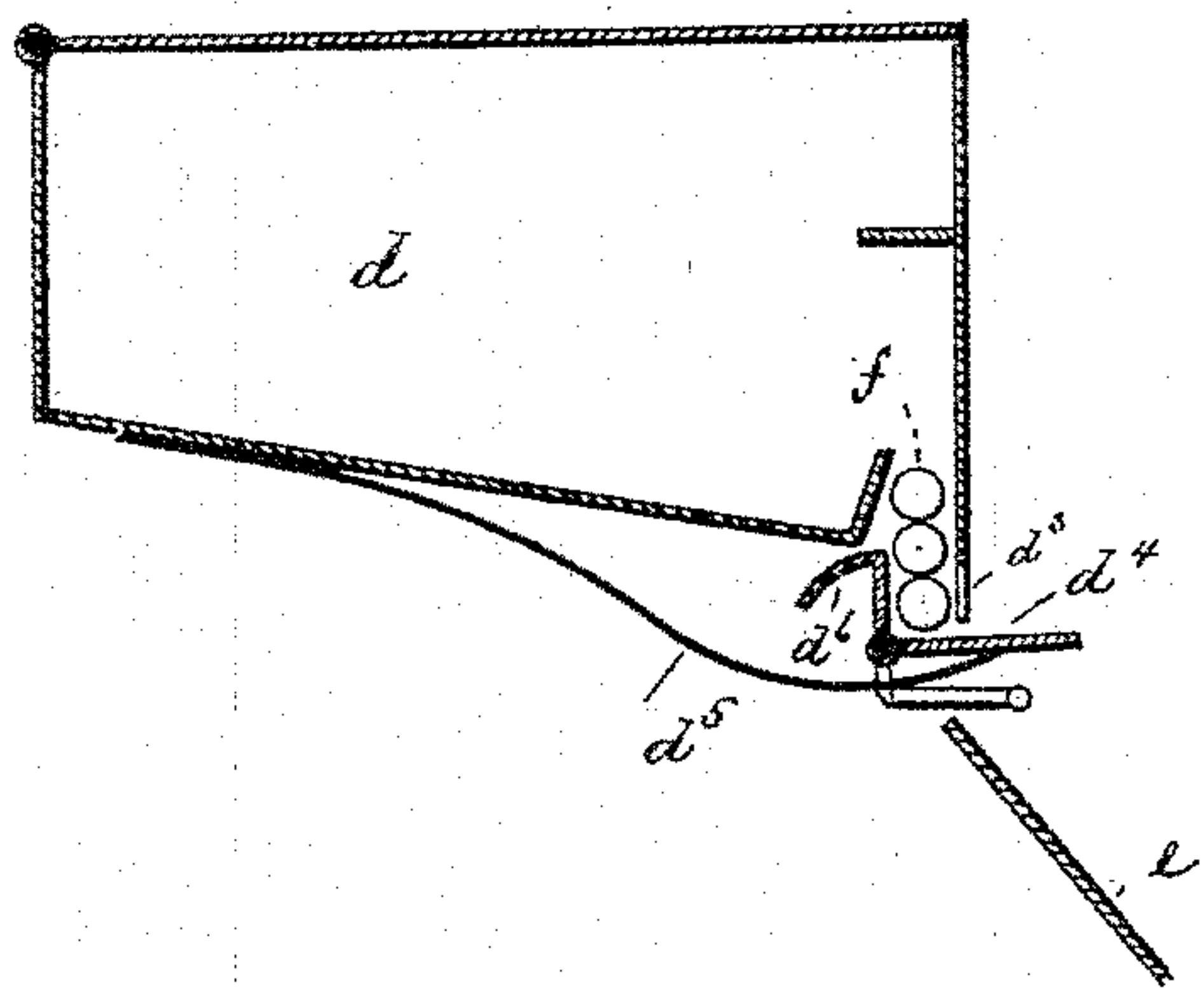


Fig: 9

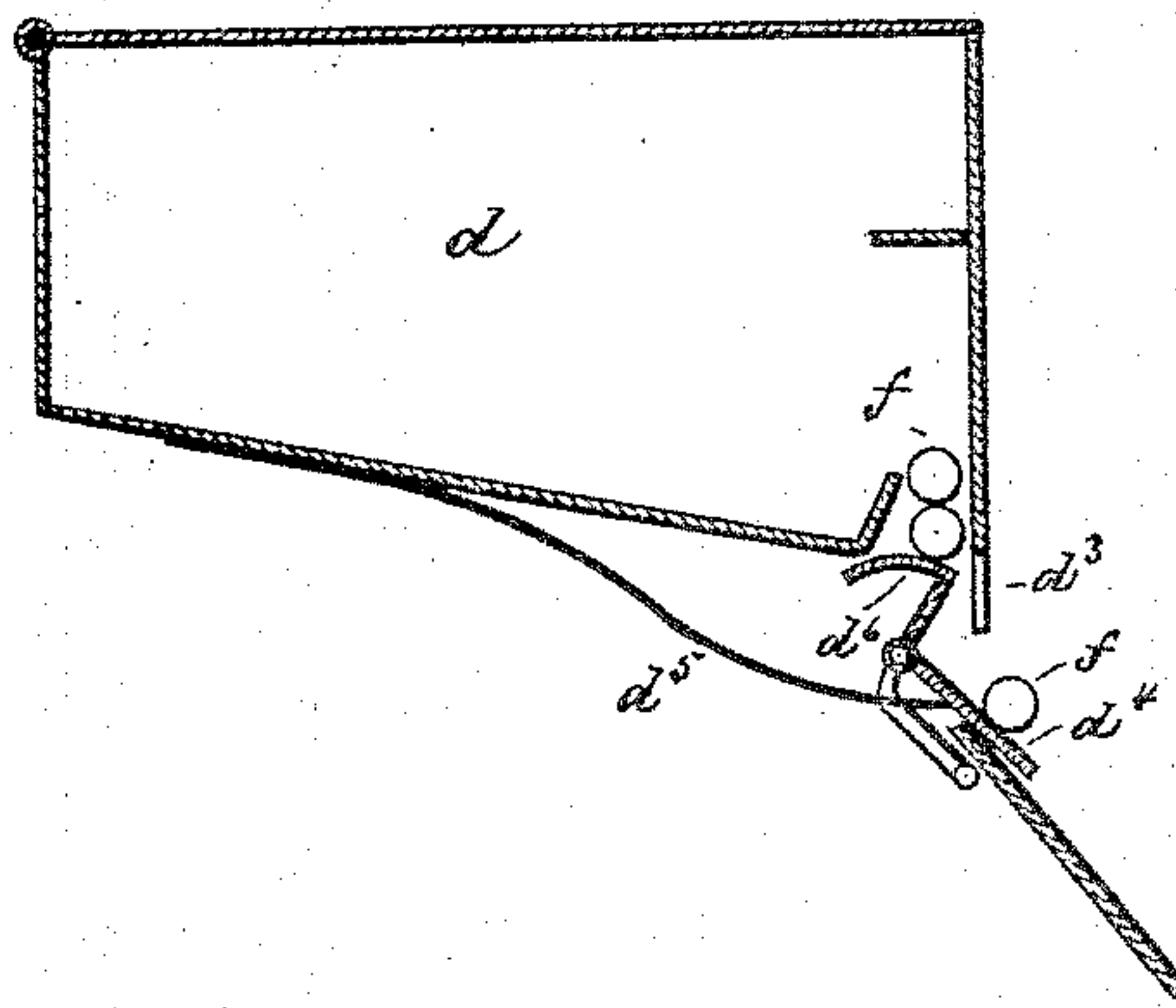
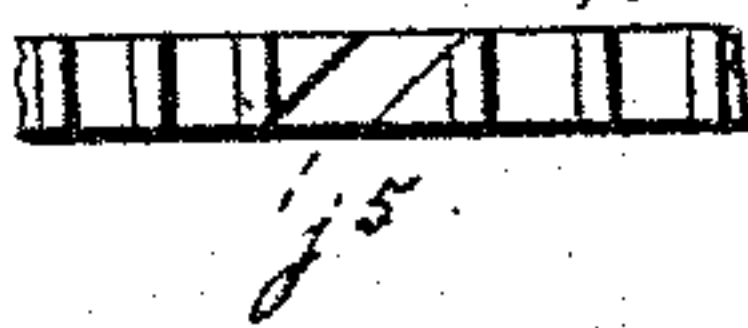


Fig: 10



WITNESSES:

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UNITED STATES PATENT OFFICE.

RUDOLF KRAUS, OF LONG ISLAND CITY, NEW YORK, ASSIGNOR OF THREE-TWENTIETHS TO FRANZ BERGMANN, OF SAME PLACE.

AUTOMATIC MATCH-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 491,314, dated February 7, 1893.

Application filed August 20, 1892. Serial No. 443,579. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF KRAUS, of Long Island City, Queens county, New York, have invented an Improved Automatic Match-Lighter, of which the following is a specification.

This invention relates to a machine for automatically feeding and striking a match by the turn of a hand lever.

The machine is designed for use in stores and bar rooms, where the customer can thus be easily and neatly served with a lighted match.

The invention consists in the various features of improvement more fully pointed out in the claims.

In the accompanying drawings: Figure 1 is a top view of the machine. Fig. 2 is a longitudinal section on line x, x , Fig. 1. Fig. 3 a section on line y, y , Fig. 1. Fig. 4 a section on line z, z , Fig. 1. Fig. 5 a section on line x', x' , Fig. 1. Fig. 6 a section of part of the machine showing the jaws in a different position. Fig. 7 a cross section on line $y' y'$, Fig. 2. Figs. 8 and 9 longitudinal section of box d , showing the shelf closed and open and Fig. 10 a detail edge view of part of wheel j .

The letter a , represents the frame of the machine in which turns a rock shaft b , provided with an operating handle b' . Upon rock shaft b , is mounted the loose gear wheel b^3 . To the shaft b , are furthermore secured a pair of arms or hangers b^4, b^5 , connected at their lower ends by a bar b^6 , parallel to the shaft. To the arm b^5 , there is secured a click b^7 , that engages and revolves wheel b^3 , when the shaft b , is rocked forward but does not act upon the wheel when the shaft is rocked backward. Across the frame a , and parallel to the shaft b , there is hung a second shaft c , upon which are mounted two jaws c' , provided at their ends with the spring finger c^2 , made of unequal length. Upon the shaft c , there is rigidly mounted a gear wheel c^3 , meshing into wheel b^3 , and by which motion is imparted to the shaft c , when the shaft b , is rocked forward, while no motion is imparted to the shaft c , when the shaft b , is rocked backward.

d , is a box or a hopper for receiving the

matches. It is supported upon its rear end only by springs d' , that connect it to a bracket d^2 . At the front end the box d , is provided with a slit or discharge opening d^3 , a short distance above its bottom. To the bottom of the box d , is pivoted an inclined gate or shelf d^4 , acted upon by spring d^5 , and provided with a shoulder d^6 , back of slit d^3 . In front of the shelf d^4 , there is secured to the machine frame, a fixed inclined slide e . This slide is provided with a pair of slits through which project upwardly a pair of pivoted stops e' , that are weighted at their lower ends so as to become automatically righted.

Upon the shaft c , there is mounted a star wheel c^4 , which I term the "shaker" and which on the revolution of the shaft strikes against an arm d' , of box d , to rapidly vibrate the same on its spring d' .

To the shaft b , are attached a pair of fingers b^8 , that strike against pins d' , projecting laterally from shelf d^4 , when the shaft is rocked backward. Thus the shelf is opened and permits a match to drop down upon the slide e , and against the stops e' , while the shoulder d^6 , hold the other matches back. When the shaft b , is revolved forward the fingers b^8 , will release the pins d' , and the shelf will be closed by spring d^5 . The forward motion of shaft b , will also cause the shaft c , to be revolved a semi-revolution, it being understood that one complete motion of the hand lever produces a semi-revolution of the shafts b, c . The backward motion of the shaft c , will effect two objects, firstly it will by star wheel c^4 , rattle the box and thus shake a new match through slit d^3 , and upon the shelf d^4 , ready for the next operation. Secondly, it will cause the fingers c^2 , of the revolving jaw c' , to pick up the match that lies against the stops e' , and to carry it over the stops which will be tilted by the match. As the match f , descends the inclined slide e , it will be firmly pressed in between the spring fingers c^2 , and will be carried by the same into a position directly below the shaft c . In this position the match is held while the shaft b , turns backward because as has already been stated, the shaft c , remains stationary during the backward motion of shaft b . Upon the

next forward motion of shaft *b*, the match held by the spring fingers will be carried upward to lay vertically above shaft *c*, while a new match is picked up by the other pair of spring fingers in the manner previously described. The first match in its upward motion will rub against a yielding abrading surface *g*, and become ignited. Thus it will be seen that each complete motion of the machine presents one ignited match to the operator and picks up a second match which is ignited by the next operation. To keep the abrading surface clean I employ a scraper *g'*, fast on one of the jaws *c'*.

In order to lock the shaft *c*, in position during the backward motion of shaft *b*, I employ a catch or spring hook *h*, that is adapted to engage a perforation *b³*, of wheel *c³*, when the jaws *c'*, are in their terminal or vertical positions. This engagement is broken by finger *h'*, on shaft *b*, that throws the hook away from the wheel when the shaft *b*, has almost completed its backward motion.

Upon the shaft *c*, there is also mounted a wheel *i*, having a pair of shoulders *i'*, placed diametrically opposite each other. These shoulders are adapted to be engaged by an arm *i²*, at each complete operation of the machine. The object of this arrangement is to cause the shaft to perform always a full semi-revolution and bring a pair of jaws always properly to the top.

To prevent the shaft *b*, from falling back suddenly upon the release of the handle, I connect it to a vane or fly *j*, by gear wheel *j'*, pinion *j²*, and gear wheel *j³*. The gear wheel *j'*, is fast on the shaft *b*, and engaged by a pawl *j⁴*, adapted to drop into either one of a pair of inclined notches *j⁵*, of wheel *j'*, when the lever has arrived at its most forward position. This has for its object to prevent the shaft *b*, from being revolved backward unless a full forward motion has been imparted to the lever, in as much as the pawl will slip out of the beveled notch *j⁵*, of wheel *j'*, but not out of the teeth of said wheel. When the handle is released, the shaft *b*, is rocked backward by a spring *m*, engaging the bar *b⁶*, which presses the bar forward and consequently rocks the shaft *b*, backward. The backward motion of the shaft will be imparted to the handle, which will drop down gently under the influence of the fly wheel *j*, as already stated.

If desired, a sliding knife *k*, may be employed to cut off the tip of the cigar introduced through a perforation *k'*. This knife is oper-

ated by a suitable lever *k²*, acted upon by a pin *k³*, on bar *b⁶*. When the handle *b'*, is thrown forward the knife will be raised to cut off the tip. But when the handle falls backward, a spring *k⁴*, acting upon lever *k²*, will cause the knife to descend below the perforation *k'*.

What I claim is,

1. The combination of a revolving shaft with a pair of jaws secured thereto, a vibrating hopper, a pivoted stop between the hopper and the jaws and with a rubbing surface, substantially as specified.

2. The combination of a revolving shaft with a pair of jaws having spring fingers and with a vibrating hopper, a pivoted gate controlling its discharge orifice, a stop and a rubbing surface, substantially as specified.

3. The combination of a shaft with a pair of jaws, a hopper, springs supporting the same, a star wheel for agitating the hopper, a shelf controlling the discharge orifice of the hopper and with a rubbing surface, substantially as specified.

4. The combination of a shaft *b*, with inter-gear shaft *c*, jaws *c'*, secured thereto and having fingers *c²*, and with hopper *d*, shelf *d⁴*, inclined slide *e*, stop *e'*, and rubbing surface *g*, substantially as specified.

5. The combination of shaft *b*, having hand lever *b'*, and loose wheel *b³*, with shaft *c*, having jaws *c'*, and adapted to be intergeared with shaft *b*, and with a hopper, a pivoted shelf, a slide, a stop and a rubbing surface, substantially as specified.

6. The combination of shaft *b*, with inter-gear shaft *c*, having jaws *c'*, wheel *i*, having shoulders *i'*, and an arm *i²*, adapted to engage such shoulders, substantially as specified.

7. The combination of shaft *b*, with inter-gear shaft *c*, having jaws *c'*, and with a hopper, a pivoted stop, a rubbing surface and with a knife *k*, operated by the shaft *b*, substantially as specified.

8. The combination of shaft *b*, with notched gear wheel *j'*, pawl *j⁴*, a fly *j*, and with a shaft *c*, having jaws *c'*, a hopper, a stop and a rubbing surface, substantially as specified.

9. The combination of a shaft *c*, with a pair of jaws *c'*, a vibrating hopper, a pivoted gate having a shoulder *d⁶*, and controlling the discharge orifice of the hopper and with a stop between the hopper and the jaws, substantially as specified.

RUDOLF KRAUS.

Witnesses:

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F. V. BRIESEN.