

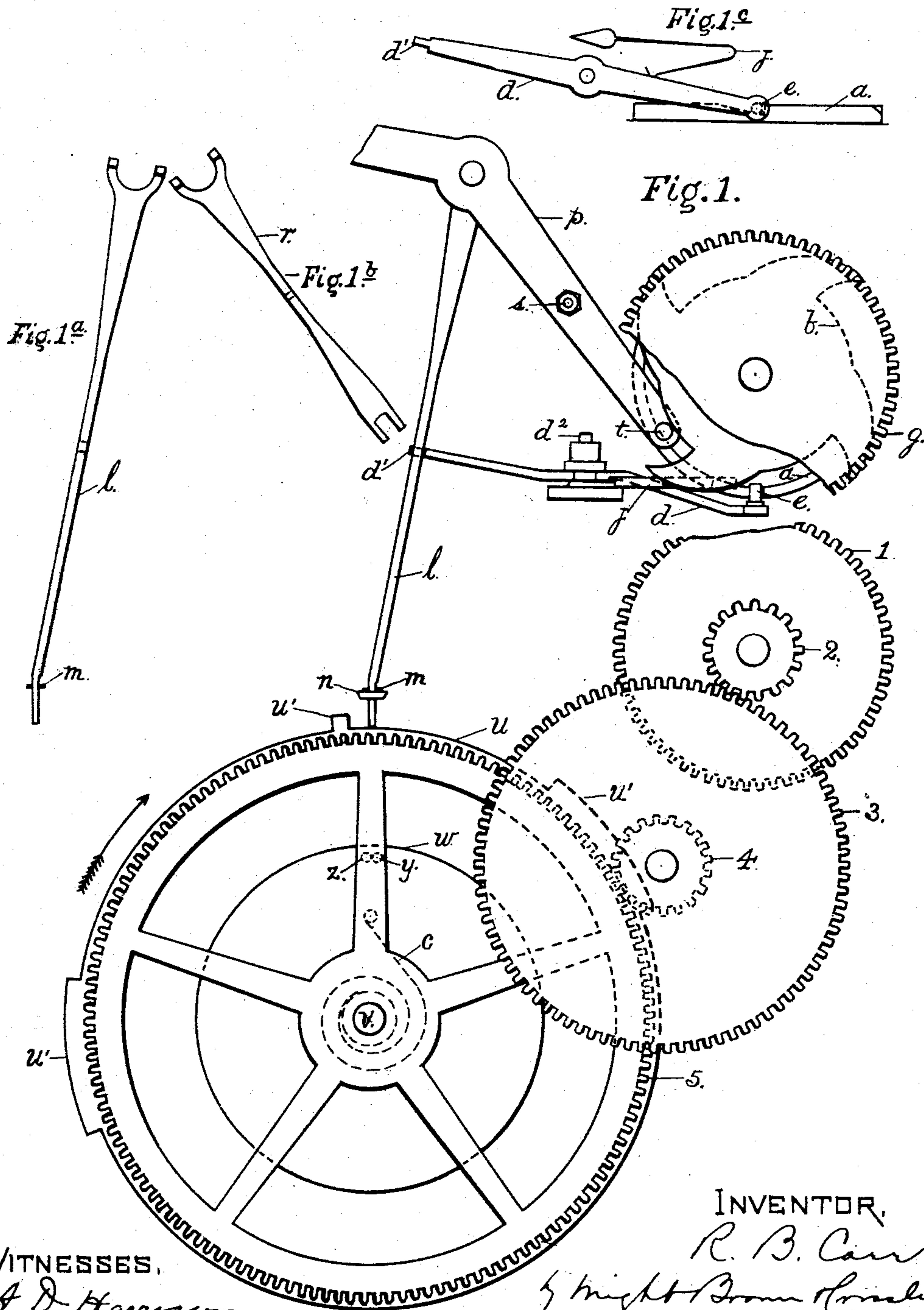
(No Model.)

4 Sheets—Sheet 1.

R. B. CARR.  
CLOCK STRIKING MECHANISM.

No. 412,018.

Patented Oct. 1, 1889.



WITNESSES.

A. D. Harrison.  
W. B. Ramsay.

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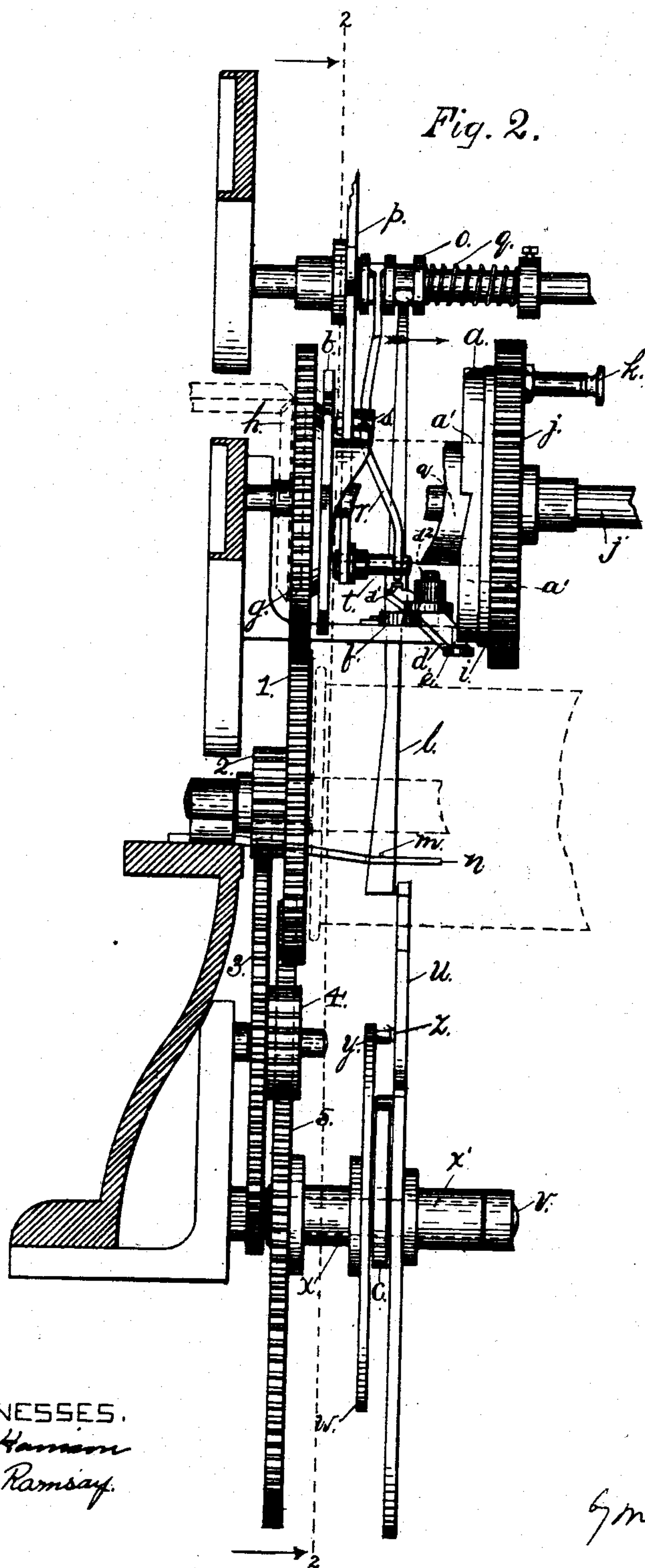
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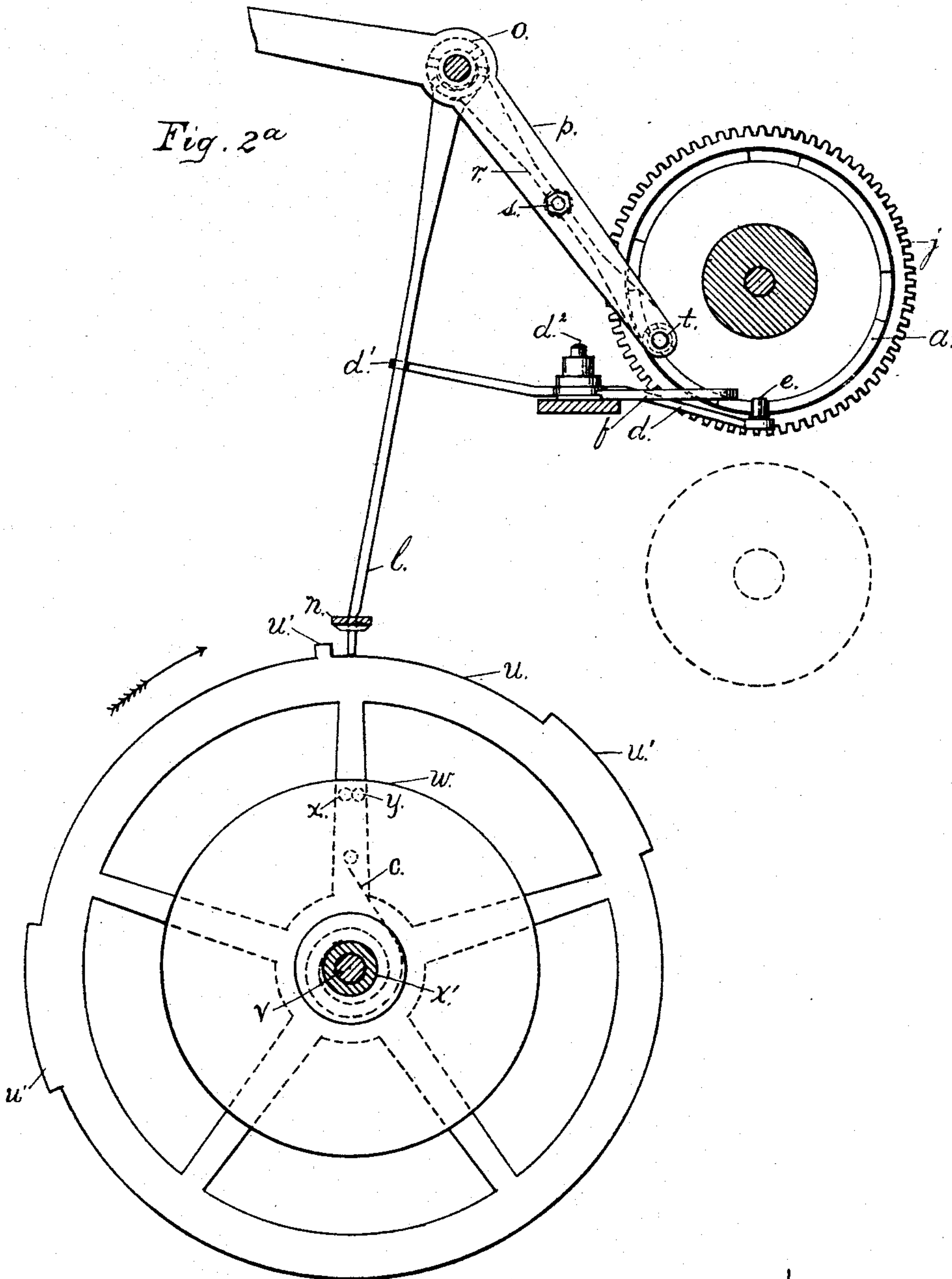
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(No Model.)

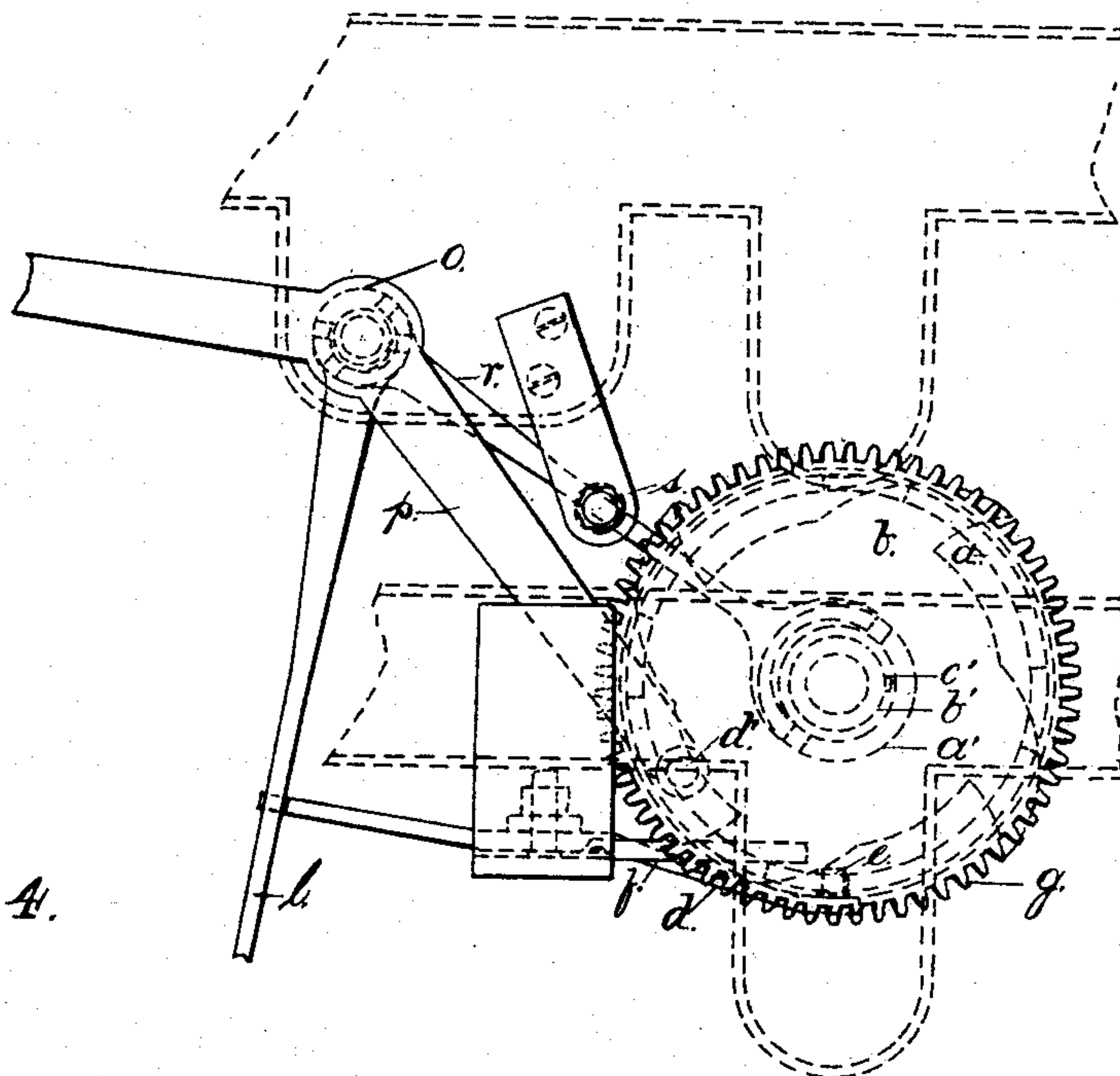
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R. B. CARR.  
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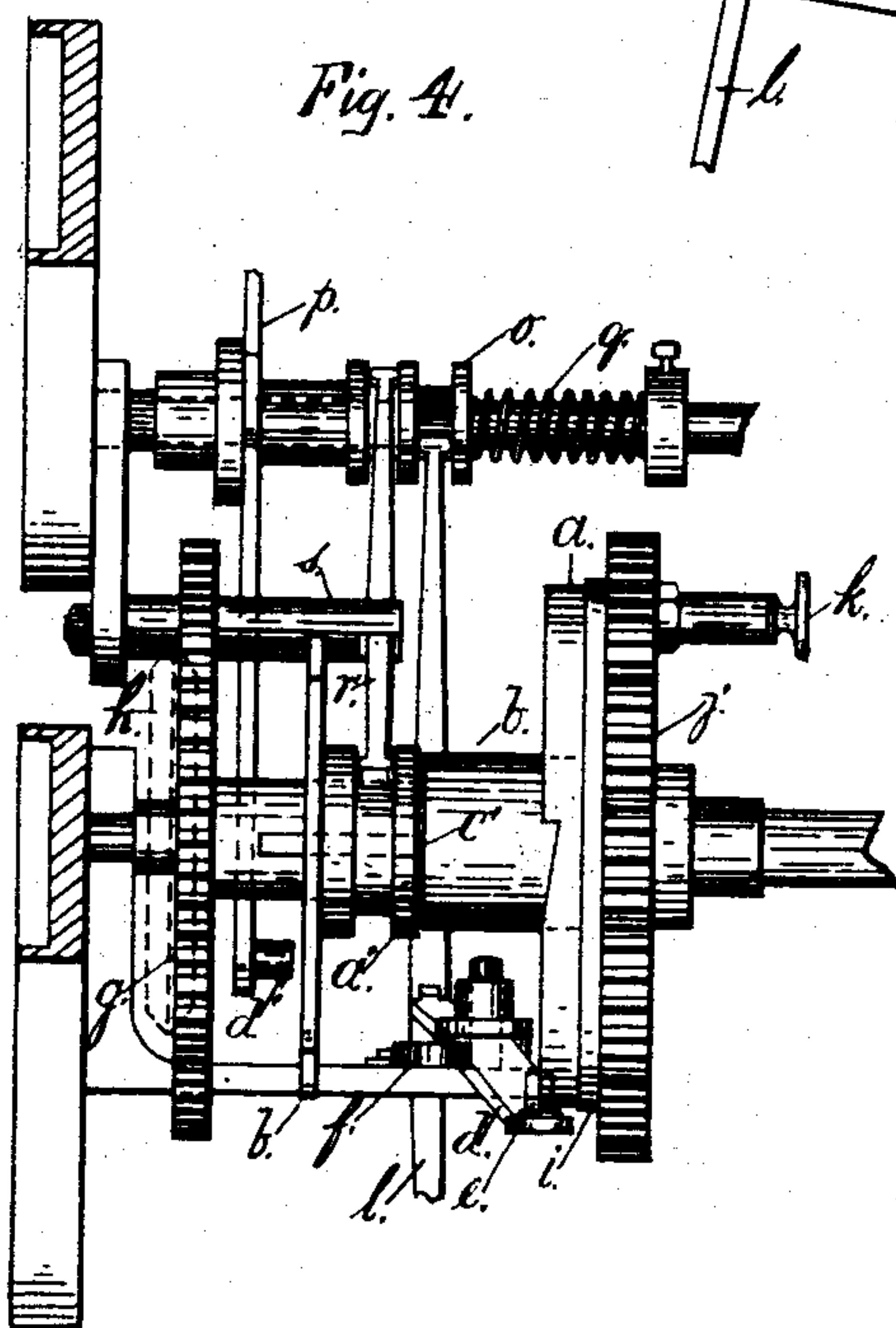
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*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

RUFUS B. CARR, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO  
THE E. HOWARD WATCH AND CLOCK COMPANY, OF SAME PLACE.

## CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 412,018, dated October 1, 1889.

Application filed July 18, 1888. Serial No. 280,312. (No model.)

*To all whom it may concern:*

Be it known that I, RUFUS B. CARR, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and  
5 useful Improvements in Clocks, of which the following is a specification.

My invention relates to mechanism for releasing the striking part of a clock-movement; and it consists in a simple and reliable mechanism, hereinafter described, which can be adjusted to release the striking part or train at  
10 any predetermined time or times, so that a clock provided with my improvement can be caused to strike at any intervals that the fancy or requirements of the owner may dictate instead of being confined to an arbitrary and unchangeable order in striking. For example, the striking-train may be released at the expiration of the hours, the expiration of the quarter-hours, and just previous to the expiration of the hours—say one or more minutes—or at any other part or parts of the twenty-four hours of the day; or, if  
15 desired, the striking-train may be caused to remain silent at any or all of the customary times for striking, all of which I will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents  
30 a front view of my improved mechanism. Figs. 1<sup>a</sup>, 1<sup>b</sup>, and 1<sup>c</sup> represent detached views of parts shown in Figs. 1 and 2. Fig. 2 represents an edge view of the mechanism shown in Fig. 1. Fig. 2<sup>a</sup> represents a section on line 2 2, Fig. 2, looking toward the right. Figs. 3 and 4 represent modifications.

I have shown only those portions of the clock which are necessary to indicate the manner of mounting the mechanism and the  
40 relative position of the parts of the devices constituting my improvement to the parts of the clock as generally constructed.

In each figure the same letters refer to the same parts in all of the views.

45 The striking part of a clock is usually released to permit the striking operation by a cam rotated by the time mechanism dropping a lever by passing from under it, or by pins or their equivalents upon a rotating  
50 wheel dropping a lever. Preparatory to dropping the lever the cam or pin must first gradu-

ally lift the lever from its normal or resting position.

In Figs. 1 and 2 *a* is a face cam-wheel having one or more members or cams *a'*. 55

*d* represents a lever which is pivoted upon a fixed stud *d<sup>2</sup>* and provided at one end with a pin *e*, which is caused by a spring *f* to bear against the cams *a'* and follow the recesses and projections thereof as the wheel *a* rotates. 60

*b* is the unlocking-cam, which is fastened rigidly with cam *a'*, spur-wheel *g*, bevel-wheel *h*, and setting-disk *i* to a quill *q*, which is engaged with center wheel *j* by means of  
65 the spring-pin *k*, which is adapted to slide in a socket in said wheel and enters one of the holes, of which there are sixty in the setting-disk *i*. A tongue *d'* on the rear end of lever *d* enters a slot in a lever *l*, as shown in Fig. 1. 70 Said lever *l* is supported by a pin *m*, affixed to and projecting from one side thereof and resting on the fixed guide *n*, Fig. 2.

The forked upper end of the lever *l* engages with a sliding collar *o*, which is held against  
75 the unlocking-lever *p* by means of the spiral spring *q*.

*r* represents a lever which is engaged at its forked end with the sliding collar *o*, and is pivoted in the stud *s* on the side of unlocking-lever *p*. The other end of lever *r* is pivoted to the unlocking-lever pin *t*, said pin being fitted to slide in a socket in the end of unlocking-lever *p*. 80

*u* represents the programme-wheel, which 85 has a long collet *x'*, and is mounted loosely on stud *v*. Said wheel has a series of lands or projections *u'* on its periphery arranged, as hereinafter described, to co-operate with the lever *l* when the striking-train is to be released, the number and location of said lands, the number and location of the cams on unlocking-cam *b*, and the number and arrangement of the members on the cam *a* determining the times of release of the striking- 95 train.

The number of members or cams on cam *a* and the cams on unlocking-cam *b* may be so great that they can be made to operate as often as each five minutes, or possibly oftener. 100 The cams on cam *a* are constantly operating the lever *d'*; but the ultimate result—namely,



of releasing the striking-train—is only accomplished when a land on programme-wheel *u* is presented in front of the lower end of lever *l* as an obstruction to the movement of the lever. Therefore the location of the lands on the programme-wheel *u* really determines the time or times of release of the striking-train.

The spur-wheel 5 and disk *w* are mounted rigidly on a collet *x*, said collet having a free running fit on the stud *v*. The collet *x* projects through the disk *w*, and to the projection of the collet is fastened the inner end of a spiral spring *c*, the outer end of which is fastened to the programme-wheel *u*. The object of the spring *c* is to press or rotate the programme-wheel ahead in the direction indicated by the arrow in Fig. 1; but the movement of the programme-wheel in this direction is limited by a pin *y* on the disk *w* and a pin *z* on the programme-wheel, the pin *z* being held in yielding contact with the pin *y* by the spring *c*.

The disk *w* is rotated once in twenty-four hours by means of the train of wheels 1, 2, 3, 4, and 5, said train being driven by the spur-wheel *g*, forming a part of the time-train; and as the pin *z* of the programme-wheel *u* is held by the spring *c* in contact with the pin *y* of the disk *w* it follows that the programme-wheel rotates in unison with said disk.

Operation: When a member of the cam *a* passes under pin *e*, it moves the pin end of lever *d* to its farthest left-hand position, as viewed in Fig. 2, in doing which it moves the tongued end *d'* to its farthest right-hand position, moving the lower end of lever *l* toward and over the programme-wheel *u*, provided it meets no obstruction, as a land *u'*, the upper end of lever *l* being held in position by the spring *g*, in which case it has no influence on unlocking lever-pin *t*; but in case the lower end of lever *l* meets an obstruction, as a land *u'* on programme-wheel *u*, then the upper end of lever *l* is thrown over in the direction indicated by the arrow in Fig. 2 by the described movement of the lever *d*. This movement slides the collar *o* in the same direction against the pressure of the spring *q*, and causes the collar, by its engagement with the lever *r*, to swing said lever on its pivot *s*, and thereby push the pin *t* crosswise of the unlocking-lever and place said pin in the path of the approaching unlocking-cam *b*, said cam striking the pin and through it moving the unlocking-lever in the direction required to release the striking-movement, the operation of the unlocking-lever in releasing the striking-movement being well known, and therefore requiring no description nor illustration here. It will be seen that the times of release of the striking-movement depend on the number and location of the members on the cam *a* and the number and location of the lands on the programme-wheel, since the striking-movement can only be released when the lift-

ing of the pin *e* by one of the members of cam *a* is concurrent with the contact of the lever *l* with one of the lands of the programme-wheel.

The cam *a* as here shown has four members, so that if the programme-wheel lands are suitably arranged the unlocking-lever will be operated every fifteen minutes; but it is obvious that the wheel may have a greater or a less number of members.

The face-cam *a* and unlocking-cam *b* are adjusted relatively to each other, so that the pin *e* in lever *d* drops into a member *a'* in cam *a* after the cam on unlocking-cam *b* has dropped or released the end of the unlocking-lever *p'*. The members of cam *a* are shaped and timed so that the pin *e* in lever *d* is lifted to its highest position before the faces of the cams on unlocking-cam *b* come in contact with the line of pin *t* in the unlocking-lever *p*.

I have thus far described the mechanism as adapted to move the unlocking-lever pin *t* into the path of the cams on unlocking-cam *b* at the desired time.

Figs. 3 and 4 show, respectively, front and side elevations of the mechanism and clock-frame necessary to show the arrangement and manner of mounting the mechanism to produce the liberating of the striking-train of a striking clock by moving the unlocking-cam *b* so that its cams or projections will come in contact with the unlocking-lever pin *t* without the above-described movement of said pin. The required change is made by making the lever *r* of the form shown in Figs. 3 and 4 and engaging one end of said lever with the sliding collar *o*, the other end engaging with a sliding collar *a'*, on which is rigidly mounted the unlocking-cam *b*, the sliding collar *a'* being mounted loosely on the quill or sleeve *b'*. The sliding collar *a'* is made to revolve with the quill *b'* by means of a key (not shown) fastened rigidly to the hole in the collar *a'*; and fitted to slide freely back and forth in the slot *c'*, formed in the quill *b'*. The unlocking-lever pin *d'* in this case is fastened rigidly to the unlocking-lever *p*. The same object can be accomplished—namely, the releasing of the striking-train at any predetermined time or times—by the moving of certain parts of the mechanism of the clock, so that the unlocking-cam becomes operative or inoperative upon the unlocking-lever by mounting the unlocking-lever upon a sliding or movable collet, and by arranging the levers and cams so that said sliding or movable collet is moved into or out of a position, so that the pin of lever *p* becomes operative or not, as may be chosen, with the unlocking-cam *b*. The form of construction of the parts to operate in this manner is not shown in diagram, as it is deemed so self-evident as not to require it.

The remaining parts of the mechanism remain and operate the same as described in the references to Figs. 1 and 2.

I claim—



1. The combination, substantially as set forth, with the center wheel *j* and the spur-wheel *g*, of a cam-wheel *a*, having a series of members *a'* and an unlocking-cam *b* connected therewith, said cams receiving motion from the center wheel, a programme-wheel *u*, having lands or projections *u'*, gearing whereby motion is communicated to said programme-wheel from the spur-wheel *g*, the unlocking-lever *p*, having a pin *t*, and intermediate mechanism, substantially as described, whereby the pin *t* and unlocking-cam *b* are brought into operative relation to each other when a land of the programme-wheel and a member of the cam *a* concur in their action on said intermediate mechanism, as set forth.

2. The combination, substantially as set forth, with the center wheel *j* and spur-wheel *g*, of a cam *a*, having a series of members and an unlocking-cam *b* rotatively connected therewith, said cams receiving motion from the center wheel, a programme-wheel *u*, having lands or projections *u'*, gearing whereby

motion is communicated to said programme-wheel from the spur-wheel *g*, the unlocking-lever *p*, having a sliding pin *t*, a pivoted lever *r*, engaged at one end with the pin *t*, a sliding spring-pressed collar *o*, engaged with the other end of the lever *r*, a laterally-movable lever *l*, engaged at one end with the collar *o* and arranged to bear at its other end against a land of the programme-wheel, and a pivoted lever *d*, engaged at one end with the lever *l* and having at its other end a pin which is held in yielding contact with the cam *a*, all arranged and operating substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of July, A. D. 1888.

RUFUS B. CARR.

Witnesses:

C. F. BROWN,  
A. D. HARRISON.