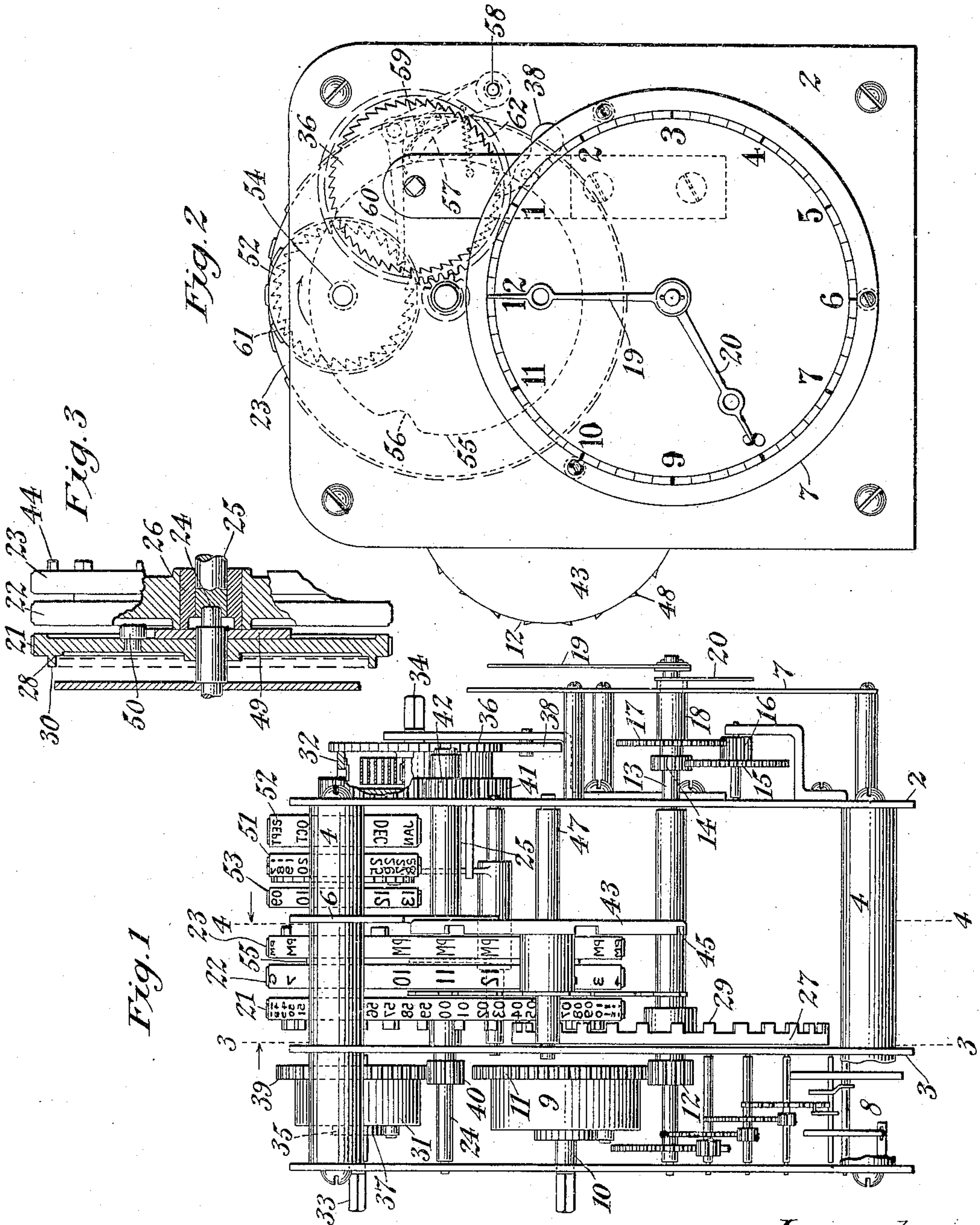


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TIME RECORDER.
APPLICATION FILED SEPT. 8, 1908.

936,691.

Patented Oct. 12, 1909.
2 SHEETS—SHEET 1.



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Fig. 5

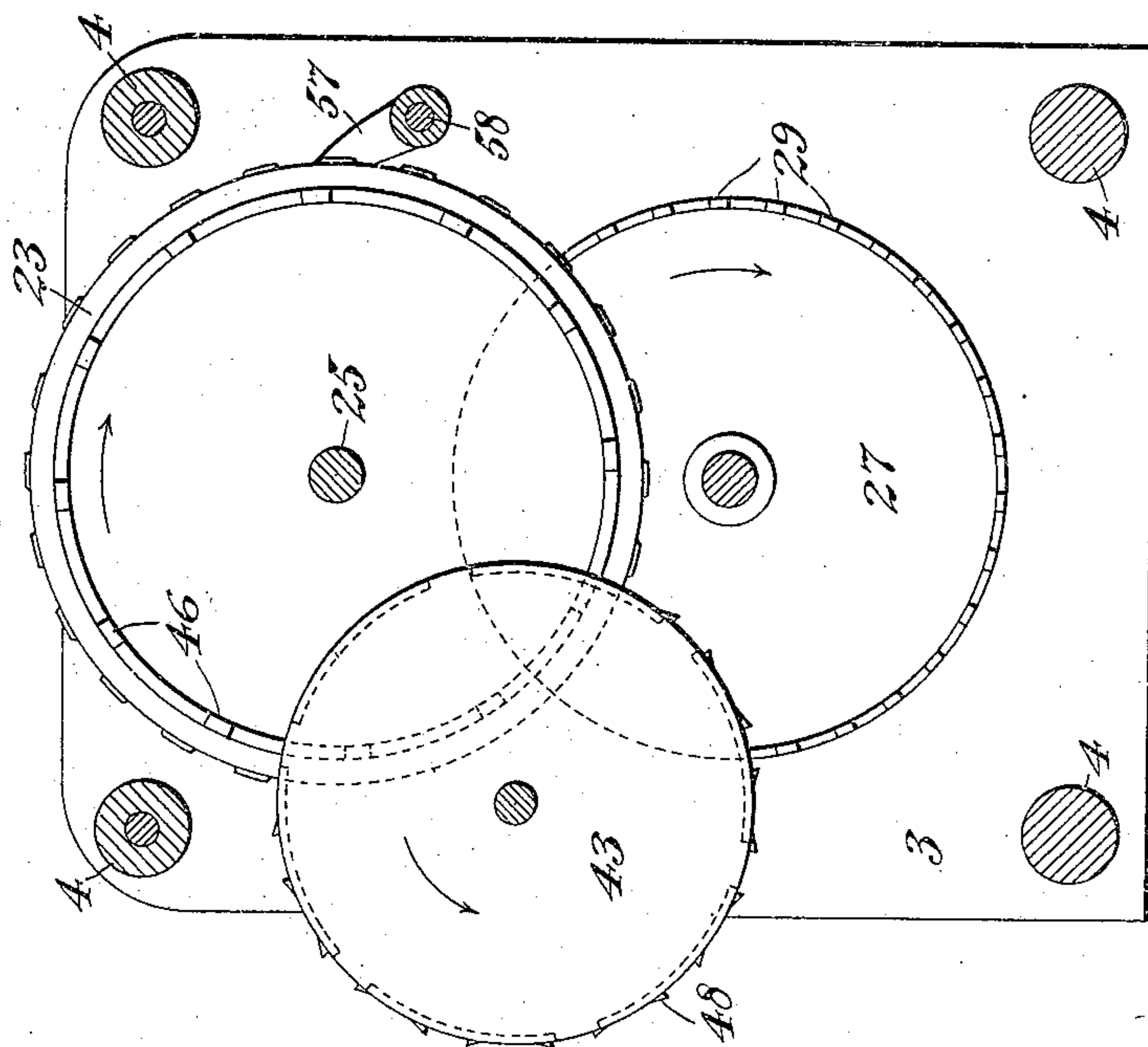
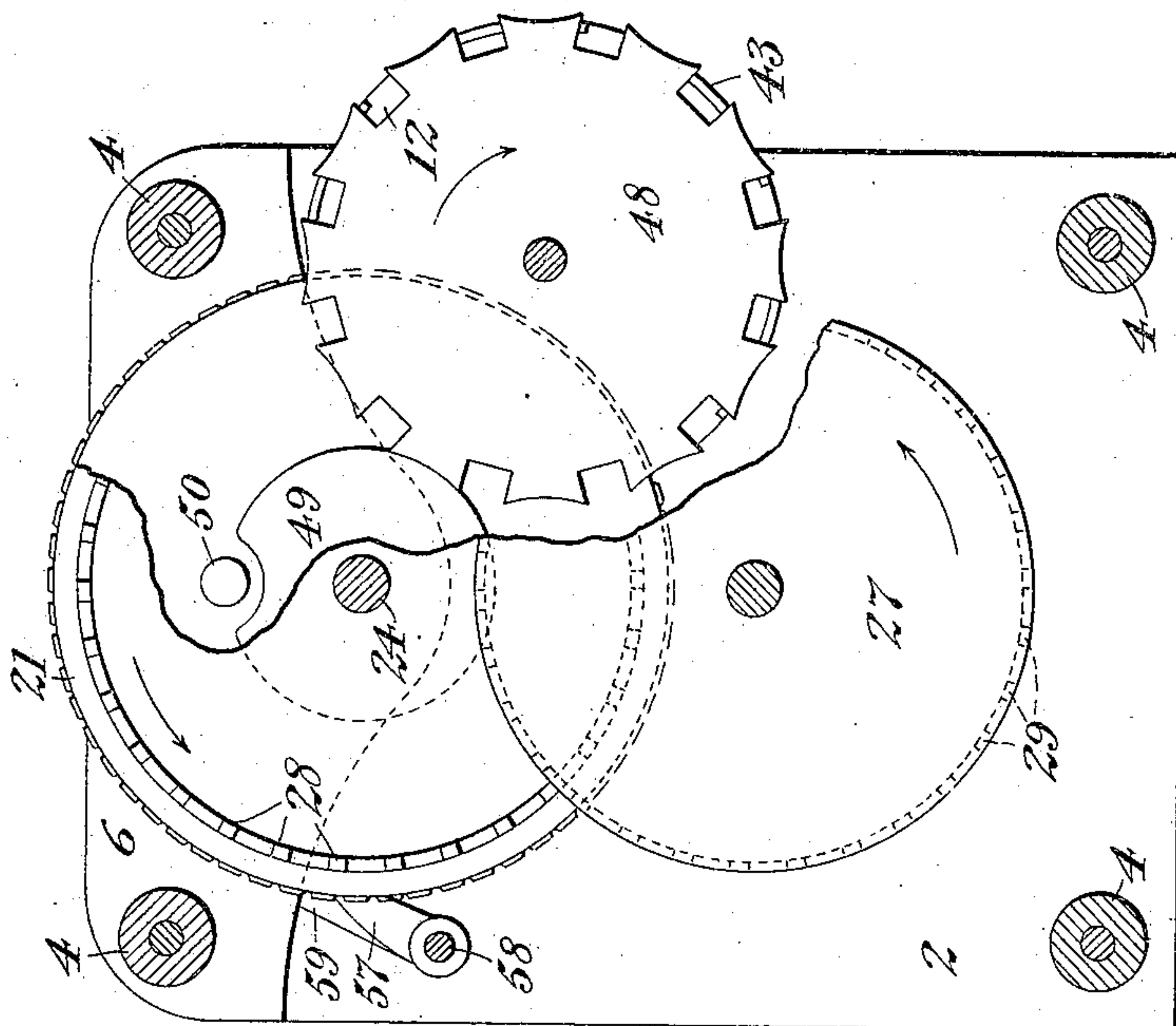


Fig. 4



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UNITED STATES PATENT OFFICE.

JULIUS ALSENZ, OF PALISADES PARK, NEW JERSEY.

TIME-RECORDER.

936,691.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed September 8, 1908. Serial No. 451,927.

To all whom it may concern:

Be it known that I, JULIUS ALSENZ, a citizen of the United States, and a resident of Palisades Park, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Time-Recorders, of which the following is a specification.

This invention relates to improvements in time recorders, and the main object of the invention is to provide an apparatus of this type in which the intermittent movements of the minute and hour recording wheels will be positively controlled wholly by rotary elements or elements movable in circuits about their axes. The preferred means for carrying into effect this feature of my invention comprises a pair of rotary devices each of which constitutes a locking and releasing wheel for the particular recording wheel which it is intended to control. In connection with this wholly rotary means for controlling the intermittent movements of the minute and hour recording wheels I prefer to employ a corresponding carrying means of the same type, that is to say, comprising carrying elements either rotatable or movable in circuits about their axes, the parts being so combined that the intermittent escapement movements of the minute recording wheel and the hour recording wheel occur in proper timing. This and other features of my invention will be hereinafter described in detail and are illustrated in the accompanying drawings, in which—

Figure 1 is an end elevation, with parts broken away, illustrating the main elements of a time recorder or time stamp embodying my invention; Fig. 2 is a front elevation of the same; Fig. 3 is a vertical section of the same, the section being taken in the line 3—3, Fig. 1, looking from the rear of the machine; Fig. 4 is a similar view, the section being taken in the line 4—4, Fig. 1, looking from the front of the machine; Fig. 5 is a sectional detail illustrating the manner in which the hour and minute recording wheels and their spindles are supported.

Similar characters designate like parts in all the figures of the drawings.

Referring first to Fig. 1, all of the parts of my time recorder or time stamp may be supported in framework similar to that of a clock, and embodying in this case the main plates 2 and 3, connected by posts, such as

4, additional plates, such as 5, 6 and 7 being also employed for supporting various parts. At 8 I have illustrated a clockwork which may be of any suitable type for imparting movement to the hour and minute spindles of a clock forming part of the machine. This clock may of course be of any suitable type. The mainspring of the clock is contained in this case in a casing 9 surrounding the main winding spindle 10 and carrying the gear 11, which drives through a pinion 12 the spindle 13 carrying the minute hand. Through a suitable train of spur gearing and pinions, indicated at 14, 15, 16 and 17, the sleeve 18 carrying the hour hand of the clock is driven at the proper ratio. The minute and hour hands are indicated at 19 and 20.

At the upper part of the machine I prefer to mount minute and hour recording wheels similar to those heretofore employed for recording time. In addition to the hour recording wheel a wheel for recording "A. M." and "P. M." will also preferably be provided for movement in unison with the hour recording wheel. These wheels may be maintained in fixed relation with each other in the direction of rotation in any suitable manner. The minute recording wheel is indicated at 21, the hour recording wheel at 22, and the wheel for recording A. M. and P. M. at 23. In the construction illustrated the spindle to which the minute recording wheel 21 is secured is indicated at 24 and is supported in the plates 5 and 3; while the spindle to which the hour recording wheel and the wheel 23 are secured is indicated at 25 and is supported in bearings in the plates 2 and 6.

Referring to Fig. 3, it will also be seen that the inner end of the spindle 24 also has a bearing in the inner end of the spindle 25. The two wheels 22 and 23, it will be seen, are mounted on and secured to the hub or sleeve 26, which in turn is fastened to the inner end of the spindle 25. All three of these recording wheels are thus mounted together side by side, but in such a manner that the first will turn freely with its spindle independently of the last two and their spindle.

It is customary in apparatus of this type to permit the minute recording wheel to turn intermittently in accordance with the movements of the time mechanism, and the wheel 21 is so controlled in the present case.

The main spindle 13 carrying the minute-hand is preferably the principal controlling element, and the movements of this spindle are employed in the apparatus shown for controlling the intermittent or step-by-step movements of the minute-recording wheel. For the purpose of permitting such intermittent movements without employing vibratory or similar escapement devices I provide preferably two rotary elements or wheels, one controlled by the shaft 13 and the other controlling the intermittent movements of the shaft 24 and so construct and combine them that the second of the two elements will be intermittently released by the first and permitted to turn and will then be locked by the first so that it can not turn again until the first has moved a farther distance sufficient to permit another release. The first of these rotary elements is preferably carried directly by and moves in unison with the spindle 13. It is indicated herein at 27. The second of these rotary members is preferably carried directly by and moves in unison with the minute recording wheel 21 and is indicated at 28. As here illustrated the wheel 27 is a flanged or crown wheel having notches or tooth-spaces 29 spaced at intervals apart corresponding to minute intervals on the minute recording wheel 21; while the wheel 28 is also a crown wheel having teeth 30 spaced at the same intervals. The teeth 30 and the notched rim of the wheel 27 rotate in the same vertical plane, and the two wheels are so disposed that their peripheries overlap to a considerable extent, the wheels being so constructed and organized as to permit one tooth 30 of the wheel 28 to pass through a notch 29 at the left side of said wheels as seen in Fig. 5 and pass within the periphery of the wheel 27, the turning of the minute recording wheel being stopped immediately after passing of said tooth within the inner side of the flange of the wheel 27 by another tooth 30 near the opposite edge of the wheel 27 striking against the inside wall of the flange of said wheel. On the next escape the tooth 30 last referred to will pass through the adjacent notch at the right-hand side of the wheel 27, as seen in Fig. 3, and out beyond the flange of said wheel, and immediately thereafter the next succeeding tooth at the left of the wheel 28 in Fig. 3 will come into contact with the outside wall of the flange of the wheel 27, which will stop the further movement of the minute recording wheel. Thus the wheel 28 with its recording wheel 21 will be intermittently released and stopped from opposite sides of its arc of intersection with the flanged wheel 27, one release taking place at one end of the arc and the succeeding stop at the opposite end of the arc and at one side of the flange, while the next release will take place at the opposite end of the arc

from the first release, and the next succeeding stop will be at the end of the arc outside that at which said first stop took place, and will also be effected by the opposite side of the flange. Thus the two wheels intermeshing and intermittently releasing and locking in this manner constitute an escapement having none but rotary parts, and assuring the intermittent release and subsequent locking of the minute recording wheel.

The power required to turn the shaft 24 carrying the minute recording wheel and the wheel 28 may be derived from any suitable source, but I prefer to use for turning the shaft 24 and also for turning the shaft 25 a source of power independent of that which drives the spindle 13 carrying the minute hand. Two separate sources of power may be employed for the spindles 24 and 25, and these may be similar in construction. They are designated generally by 31 and 32. Each consists of a movable barrel containing a spring one end of which is secured to the barrel and the other end to a winding spindle, these winding spindles being designated by 33 and 34. Ratchet-wheels, such as 35 and 36, having locking pawls or clicks 37 and 38, are also shown for preventing unwinding of the springs. The movement of the barrel 31 is transmitted in this case by a spur-gear 39 to the pinion 40 carried by the shaft 24, while that of the barrel 32 is transmitted by a spur-gear 41 to a pinion 42 secured to the shaft 25. Thus the minute recording wheel 21 and the recording wheels 22 and 23 for recording the hour and A. M. and P. M. constantly tend to turn when released by the escapement devices which control their action.

The escapement mechanism for releasing and locking the minute recording wheel before and after each intermittent movement thereof has been described. That for controlling the releasing and locking of the hour recording wheel and the A. M. and P. M. wheel is substantially similar except that the teeth of the wheel released are farther apart and the notches in the flange of the controlling wheel are also farther apart. The notched controlling wheel of the escapement mechanism for the hour recording wheel is indicated at 43 and the toothed wheel controlled thereby is indicated at 44, while the notches of the wheel 43 are designated by 45 and the teeth of the wheel 44 are shown at 46. The controlling wheel 43 is secured to the spindle 47 journaled in the main plates 2 and 3 and is disposed oppositely to the wheel 27, that is, with the flanges of the two crown wheels facing toward each other. The wheels 28 and 44, however, face oppositely and away from each other. The wheel 44, as in the case of the wheel 28, is or may be secured directly to one of the wheels controlled by it, it

being fastened in this case directly to the side of the A. M. and P. M. wheel. The teeth 46 and the notches 45 are disposed at such intervals as to assure the release of the hour recording wheel each time the minute recording wheel makes a complete rotation, the inner and outer walls of the flange of the wheel 43 serving to lock the hour recording wheel against movement at all other times.

In order that the notched controlling wheel 43 may move a single step—that is, a distance equal to the interval between two notches 45—at each complete rotation of the minute recording wheel, suitable carrying means will be provided. In this case, as in the case of the escapement mechanism hereinbefore described, I prefer to use an all-rotary mechanism, that is to say, coacting elements movable in circuits about their axes. The particular type of mechanism which I have illustrated as the carrying means in this construction is a Geneva stop movement comprising Geneva and stop wheels 48 and 49, the latter having the usual tooth or roller 50 adapted to pass into and out from the tooth spaces of the Geneva wheel. The stop-wheel 49 and the tooth or pin 50 constitutes the primary element of the carrying means and are secured in this case to the minute recording wheel for movement in unison therewith, while the Geneva wheel 48 is secured to the shaft 47 for movement in unison with the controlling wheel 43 of the hour wheel escapement. Thus each time that the minute recording wheel makes a complete rotation the pin 50 will turn the Geneva wheel 48 one step and said wheel will then be locked by the periphery of the stop-wheel 49 until the minute recording wheel makes another rotation. The releasing, locking and carrying means thus described constitute a very simple and effective means for controlling the necessary step-by-step movements of the minute and hour recording wheels and for preventing overthrow thereof.

Means will also preferably be used for recording the day, month and year, as well as the hour and minute of the morning or afternoon at which a record is made. For the purpose of making such records I have shown at 51, 52 and 53 wheels for recording the day, month and year. These wheels are carried by the spindle 54 journaled in the plates 2 and 6 near the top of the machine. The wheels 52 and 53 may be turned either by hand or by the mechanism, as may be desired. The central wheel or day-recording wheel 51 is preferably turned from the hour recording wheel 22 by a cam 55 secured thereto, which cam has in one side thereof a notch 56 into which the point of a pawl 57 may drop at each complete rotation of the cam-wheel 55. The pawl 57 is secured to a

rock-shaft 58 journaled at its opposite ends in the plates 3 and 6 and carries a rock-arm 59 to which is pivoted an actuating pawl 60 meshing with the teeth of a ratchet-wheel 61 preferably formed integral with the day recording wheel 51. A spring 62 serves to supply power for operating the pawl 60 to turn said ratchet-wheel. It will be obvious that at each complete rotation of the cam-wheel 55 the ratchet-wheel 61 will be turned one step by the pawl 57 being forced into the notch 56 and the pawl 60 correspondingly actuated by the spring 62, after which the continued rotation of the cam-wheel will withdraw both of said pawls. Thus the day recording wheel will be turned each time the hour recording wheel makes a complete rotation, it being understood that the hour recording wheel has two complete sets of recording numerals 1 to 12, corresponding respectively to the A. M. and P. M. types on the wheel 23.

What I claim is:

1. A time recorder, comprising clockwork, minute and hour recording wheels having type faces facing in the same direction and substantially parallel with the axes of said wheels respectively, means for actuating the clockwork and said recording wheels, a pair of differential escapement mechanisms one interposed between the clockwork and the minute recording wheel and the other between the minute and hour recording wheels and each consisting of a pair of intermeshing wheels the escape-wheel of each pair being in fixed relation with its respective recording wheel, and carrying means between said recording wheels.

2. A time recorder, comprising clockwork, minute and hour recording wheels having type faces facing in the same direction and substantially parallel with the axes of said wheels respectively, means for actuating the clockwork and said recording wheels, a pair of differential escapement mechanisms one interposed between the clockwork and the minute recording wheel and the other between the minute and hour recording wheels and each consisting of a pair of intermeshing crown wheels the coacting portions of which move in a common plane the escape-wheel of each pair being in fixed relation with its respective recording wheel, and carrying means between said recording wheels.

3. A time recorder, comprising clockwork, minute and hour recording wheels having type faces facing in the same direction and substantially parallel with the axes of said wheels respectively, means for actuating the clockwork and said recording wheels, a pair of differential escapement mechanisms one interposed between the clockwork and the minute recording wheel and the other between the minute and hour recording wheels and each consisting of a pair of intermesh-

ing crown-wheels the controlling wheel of each pair having a notched annular flange coöperating with teeth of the other wheel of the pair and the inner and outer walls of
5 said flange forming alternately stops for said teeth the escape-wheel of each pair being in fixed relation with its respective recording wheel, and carrying means between said recording wheels.
10 4. A time recorder, comprising clockwork, minute and hour recording wheels, independent motors for said clockwork and each of said recording wheels, a pair of differential escapement mechanisms one interposed

between the clockwork and the minute recording wheel and the other between the minute and hour recording wheels and each consisting of a pair of intermeshing wheels, and carrying means between said recording wheels. 15 20

Signed at New York, in the county of New York, and State of New York, this 4th day of September, A. D. 1908.

JULIUS ALSENZ.

Witnesses:

C. S. CHAMPION,
R. CHAMPION.