

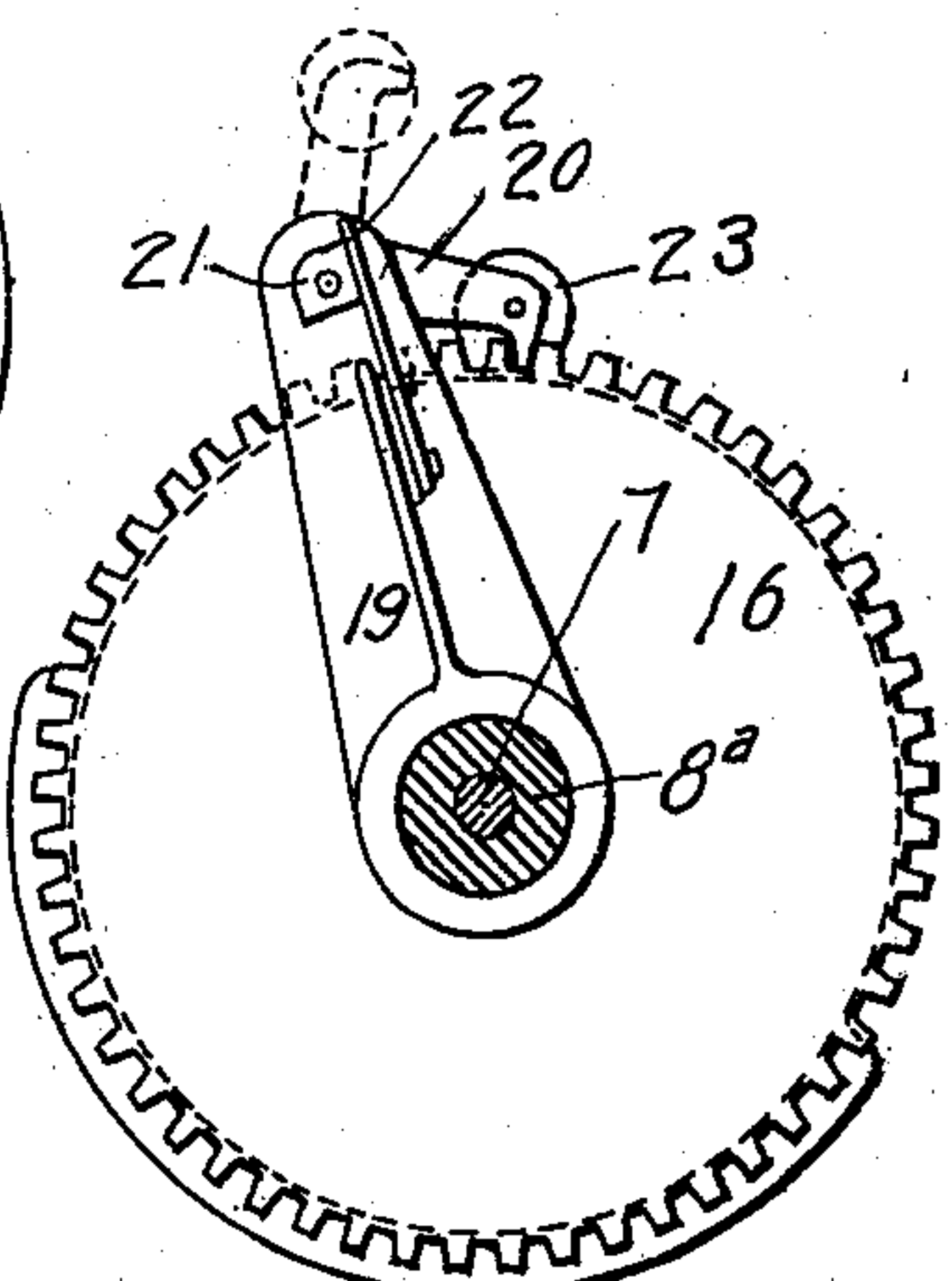
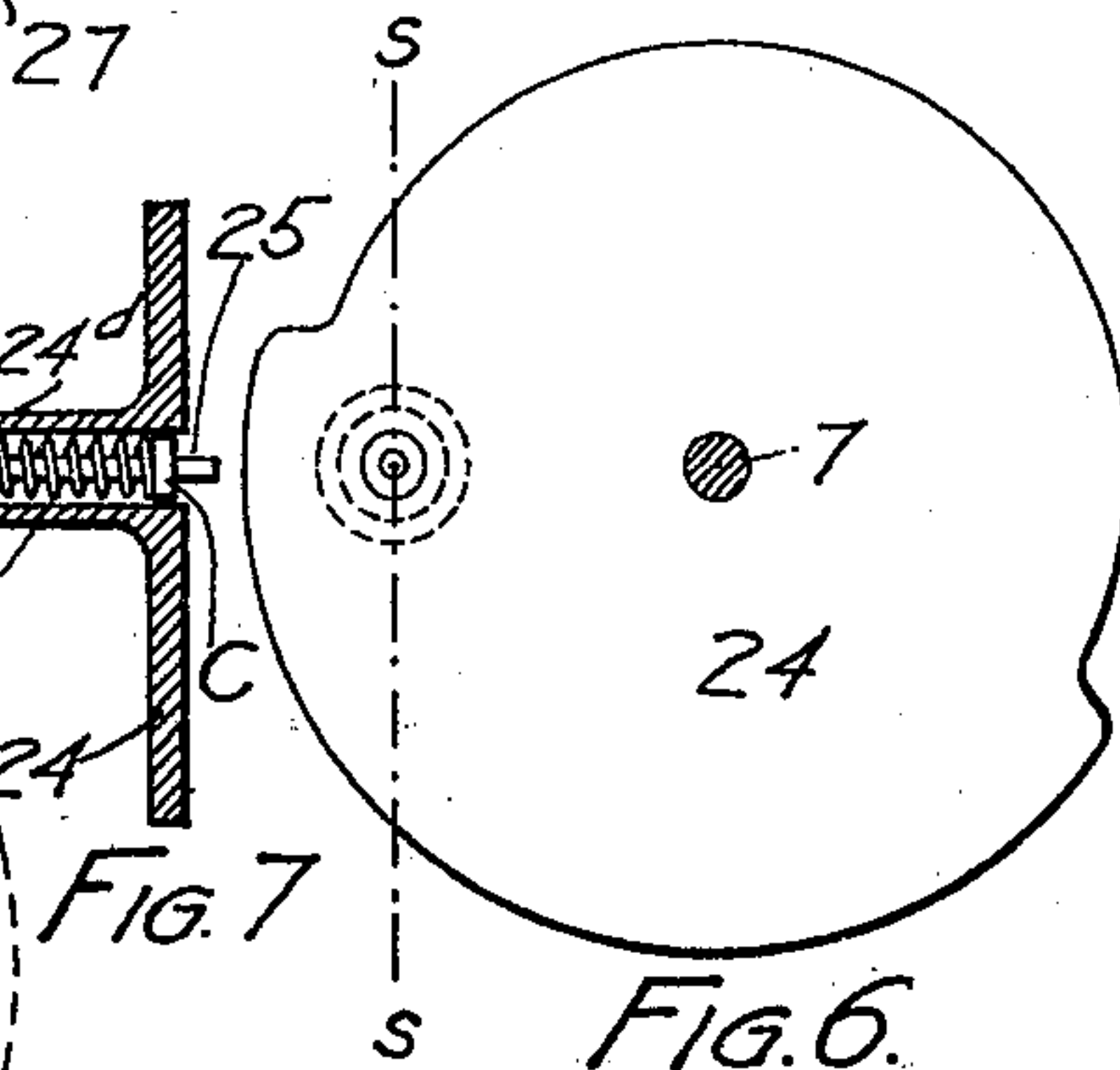
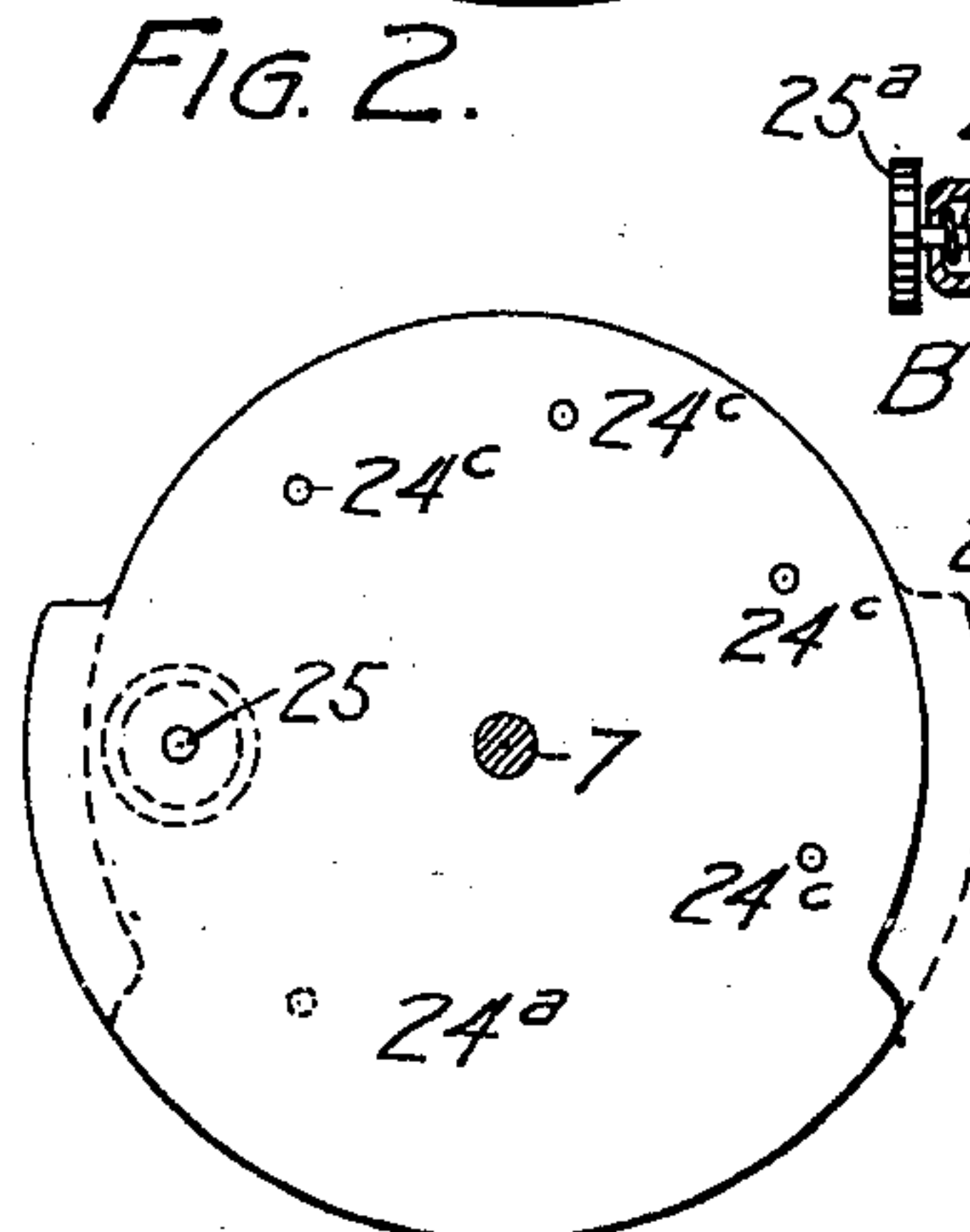
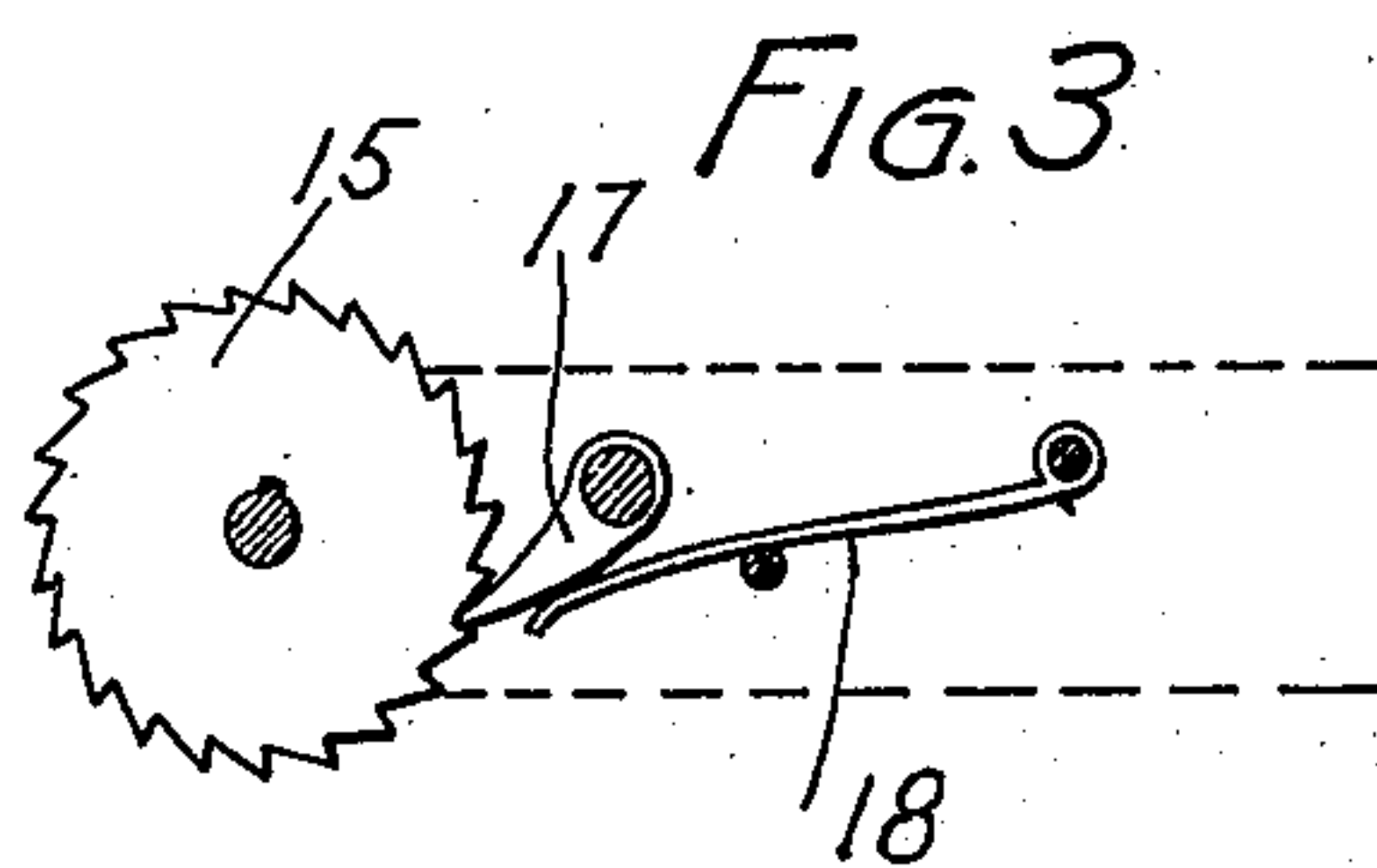
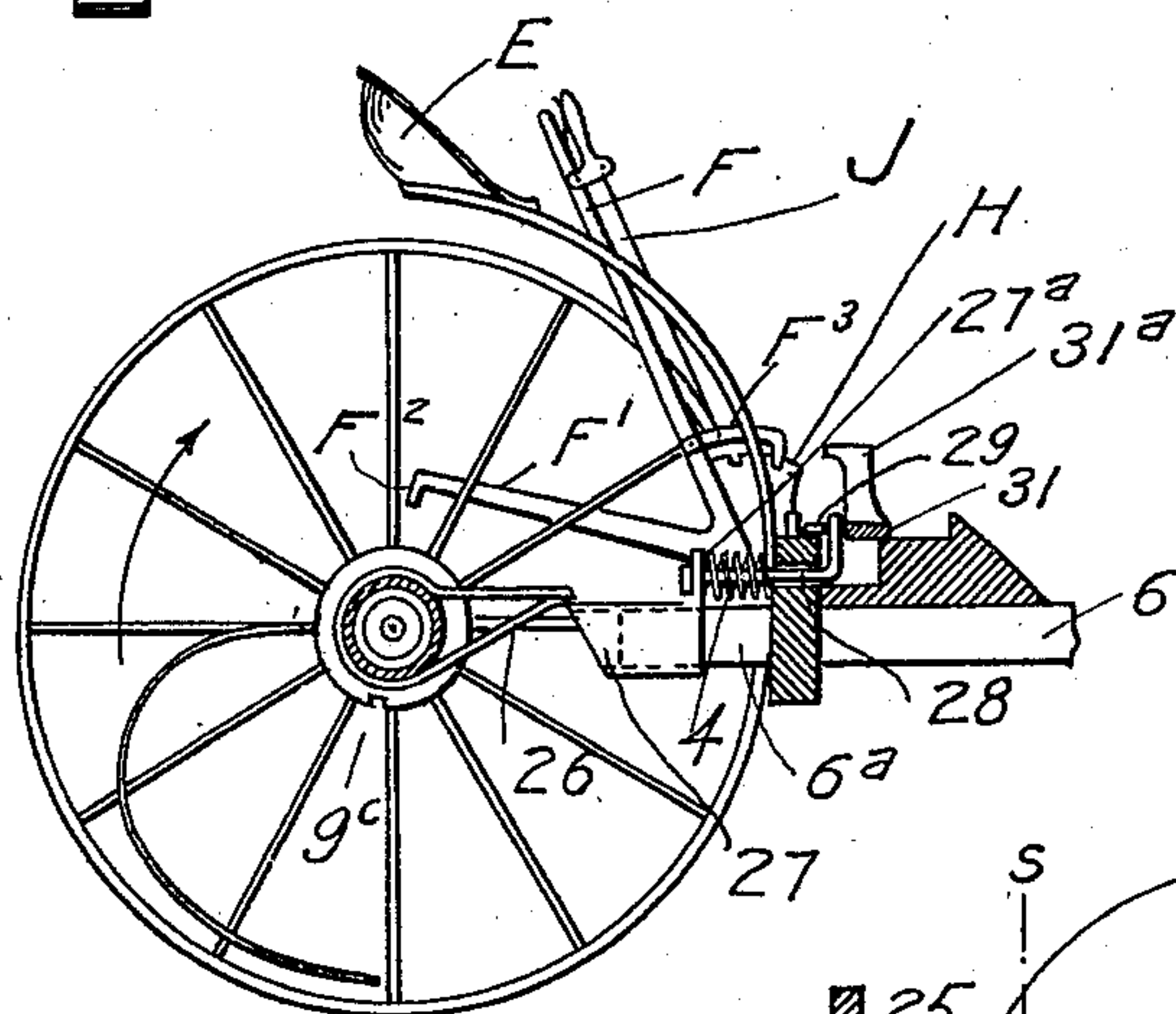
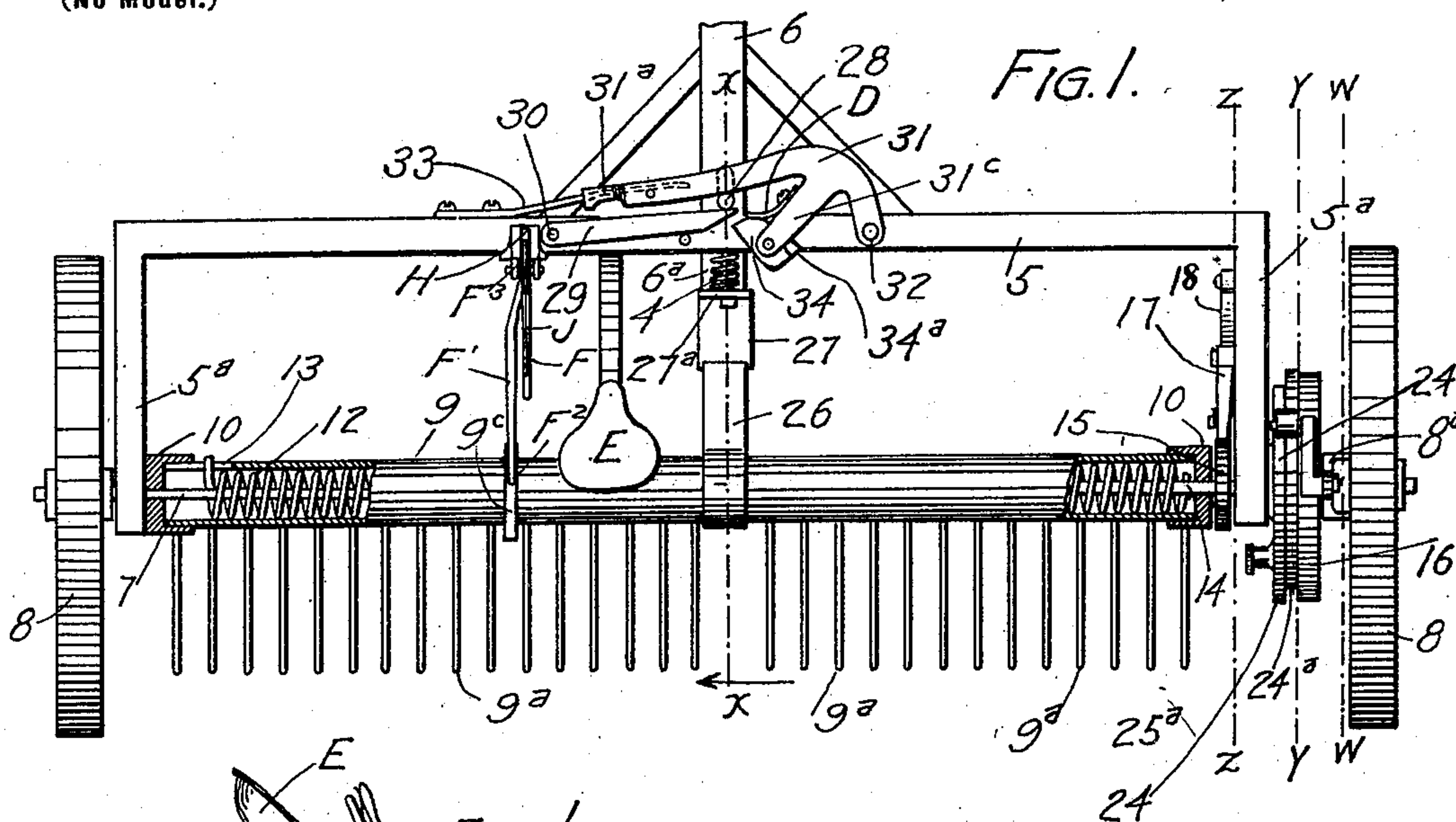
No. 670,379.

Patented Mar. 19, 1901.

E. V. SWERN.
REVOLVING HAY RAKE.

(Application filed Aug. 20, 1900.)

(No Model.)



WITNESSES:
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UNITED STATES PATENT OFFICE.

ERNEST V. SWERN, OF DENVER, COLORADO.

REVOLVING HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 670,379, dated March 19, 1901.

Application filed August 20, 1900. Serial No. 27,515. (No model.)

To all whom it may concern:

Be it known that I, ERNEST V. SWERN, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Revolving Hay-Rakes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in revolving hay-rakes; and it consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan view of my improved rake, partly in section. Fig. 2 is a section taken on the line *x x*, Fig. 1, viewed in the direction of the arrow. Figs. 3, 4, and 5 are sections taken on the lines *z z*, *y y*, and *w w*, respectively, Fig. 1. Fig. 6 is a section taken through the shaft, illustrating the stationary cam-disk. Fig. 7 is a section taken on the line *s s*, Fig. 6. In Figs. 3 to 7, inclusive, the parts are shown on a larger scale than in Figs. 1 and 2.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the U-shaped frame, to which is attached a tongue 6. In the rearwardly-projecting arms 5^a of this frame is journaled a shaft 7, whose extremities are provided with journals for the ground-wheels 8. The shaft 7 passes longitudinally through a hollow roller 9, whose extremities are fast in sockets 10, journaled on the shaft 7, adjacent the arms 5^a of the frame. Within the roller 9 is located a coil-spring 12, which surrounds the shaft 7. One extremity of this spring is attached to the roller, as shown at 13, while the other extremity is secured to the shaft, as shown at 14. To the shaft 7 are made fast two ratchet-wheels 15 and 16. The wheel 15 is engaged by a pawl 17, which locks it against movement in one direction. This pawl is pivotally mounted on one of the arms 5^a of

the frame and is normally held in engagement with the teeth of the ratchet by a spring 18. Fast on the hub 8^a of one of the wheels 8 is an arm 19, upon whose outer extremity is pivotally mounted a dog 20, adapted to normally engage the teeth of the ratchet-wheel 16. To one extremity of the spindle of the dog is made fast a small block 21, having two flat sides occupying positions at right angles to each other. A spring 22, fast on the arm 19, engages one of the flat sides of the block when the dog 20 engages the teeth of the ratchet-wheel and the other flat side of the block when the dog is disengaged from the teeth of the ratchet and raised to the position shown by dotted lines in Fig. 3.

The dog 20 carries an antifriction-roller 23, arranged to engage the peripheral edge of a disk 24, which is fast in the frame and so shaped as to permit the dog 23 to engage the teeth of the ratchet-wheel during a portion of its rotation with the ground-wheel 8, while the other portion of the disk is cam-shaped and adapted to throw the dog out of engagement with the teeth of the ratchet-wheel. In order to vary the distance between the extremities of the cam on the disk, the latter is provided with an adjustable member 24^a, located between the disk 24 and the ratchet-wheel 16. The member 24^a is provided with a cam on its periphery, which cam may be of the same length as the cam of the disk 24. When the members 24 and 24^a are so arranged that their cam portions coincide, (see Fig. 4,) the adjustable part 24^a performs no function. However, if the member 24^a be turned in either direction it is evident that the space between one extremity of the cam on the disk 24 and one extremity of the cam on the member 24^a will be varied, (see dotted lines in Fig. 4,) and since the roller 23 is long enough to engage the peripheral edges of both disks it is evident that the dog will be held out of engagement with the ratchet for a longer period during each revolution, and consequently will engage the ratchet during a short portion of each revolution. The member 24^a is journaled on the shaft 7 and is normally locked on the disk 24 by a spring-held pin 25, which engages an opening 24^c, formed in the member 24^a. There is a number of openings 24^c. The pin 25 passes through a casing 24^d, formed

on the disk 24, and is provided with a cap 25^a, which engages the casing externally: A coil-spring B is located within the casing and surrounds the pin. This spring is located between a stop C on the pin and the top of the casing. (See Fig. 7.) When it is desired to change the position of the member 24^a, the cap of the pin is pulled outwardly sufficiently to disengage the pin from the opening 24^c. The disk member is then turned until another opening 24^c is brought into line, after which the pin is released and allowed to enter the opening. Suitable rake-teeth 9^a are attached to the roller 9. To the central part of the roller is made fast a projection 26, arranged to normally engage a dog 27, slidably mounted on the rearward projection 6^a of the tongue. The dog 27 is provided with an upwardly-projecting lug 27^a, through which passes a rod 28, having a head engaging the rear side of the lug. A spring 4, surrounding the rod, is located between the lug 27^a and the frame-bar 5. This rod 28 passes forwardly through an opening in the bar 5, its forward extremity being bent upwardly to project above the bar into the path of the lever 29, fulcrumed on the frame 5, as shown at 30. A lever 31 is also fulcrumed on the frame, as shown at 32, and provided at its extremity remote from the fulcrum with an upward projection 31^a. This extremity of the lever remote from the fulcrum is also engaged by a spring 33. The lever 31 is provided with a rearwardly-projecting arm 31^c, upon which is mounted a dog 34, adapted to engage the lever 29 and force it against the upwardly-projecting extremity of the rod 28 when the part 31^a of the lever 31 is thrust forwardly, which action is accomplished by the foot of the person in charge of the machine. As the rod 28 is moved forwardly it is evident the dog 27 is given a corresponding movement, releasing the projection 26 on the spring-roller.

From the foregoing description it will be understood that as the machine moves along the arm 19 will rotate with its wheel 8 and the dog 20 will engage the teeth of the ratchet-wheel 16 and give it a partial rotation for every revolution of the wheel 8. This partial rotation turns the shaft 7 in a direction to tighten the spring 12 or places it under tension, while the dog 17 engages the ratchet 15 and locks the shaft against the return movement. At the same time the projection 26 of the spring-roller engages the dog 27 and locks the roller from turning in the direction of the shaft's movement. In this manner power is stored in the spring 12 while the teeth 9^a of the roller are gathering the hay. When it is desired to release or dump the hay, the driver presses his foot on the projection 31^a and thrusts the dog 27 forwardly in the manner heretofore explained, thus releasing the projection 26. The tension of the spring then acts to turn the roller in the direction indicated by the arrow in Fig. 2 a single revolution only, since the dog 27, actuated by the

spring 4, will return to its normal position as soon as the part 31^a is released from pressure.

The dog 34 is normally held in position to engage the lever 29 when the lever 31 is actuated, as heretofore explained, by a spring D, mounted on the arm 31^c, and the stop 34^a, which is formed on the dog and prevents the spring from moving the dog too far rearwardly.

The driver occupies a seat E, suitably mounted on the frame.

In order to hold the spring-roller in such position that the teeth will be raised from the ground, as when driving from place to place, I employ a lever F, fulcrumed on the frame at its lower extremity and having a rigid arm F', terminating in a hook F², adapted to engage a recess 9^c in the roller. These parts normally occupy the position shown in Fig. 2, being held in place by a dog F³, connected at one extremity with the lever and at the opposite extremity engaging a notch in the segment H. This dog is connected with the ordinary releasing-bar J.

When it is desired to support the teeth in the raised position, the lever F and its connections are first manipulated to drop the hooked extremity of the arm F to engagement with the roller in the same plane with the recess 9^c. Assuming there is some power stored in the spring 12, if the part 31^a is thrust forward to actuate the lever 31, as heretofore explained, the roller will be released and the recoil of the spring 12 will turn the roller until the hook F² engages the recess 9^c, when the roller will be maintained in position to support the teeth above the ground.

Having thus described my invention, what I claim is—

1. In a hay-rake the combination with a suitable frame and ground-wheels upon which the frame is supported, of a roller journaled on the frame and provided with rake-teeth, a spring connected with the roller, and means operated from a wheel of the machine for storing power in the spring to actuate the roller.

2. In a hay-rake the combination of a suitable frame, and ground-wheels upon which the frame is supported, of a roller suitably supported and provided with rake-teeth, a spring connected with the roller, and means operated from a ground-wheel for intermittently storing power in the spring to actuate the roller.

3. In a hay-rake the combination with a frame and ground-wheels upon which the frame is supported, of a shaft upon which the wheels are journaled, a roller through which the shaft passes, rake-teeth attached to the roller, a coil-spring surrounding the shaft, one extremity of the spring being connected with the shaft and the other with the roller, and means operated from a ground-wheel for storing power in the spring to actuate the roller.

4. In a hay-rake the combination with a

frame and ground-wheels upon which the frame is supported, of a shaft upon which the wheels are journaled, a roller through which the shaft passes, rake-teeth attached to the roller, a coil-spring surrounding the shaft, one extremity of the spring being connected with the shaft and the other with the roller, and means operated from a ground-wheel for intermittently storing power in the spring to actuate the roller.

5. In a hay-rake the combination with a frame and ground-wheels upon which the frame is supported, of a shaft upon which the wheels are journaled, a roller through which the shaft passes, rake-teeth attached to the roller, a coil-spring surrounding the shaft, one extremity of the spring being connected with the shaft and the other with the roller, means operated from a ground-wheel for storing power in the spring to actuate the roller, and suitable means for locking the roller against movement in response to the power of the spring.

6. In a hay-rake the combination with a frame and ground-wheels upon which the frame is supported, of a shaft upon which the wheels are journaled, a roller through which the shaft passes, rake-teeth attached to the roller, a coil-spring surrounding the shaft, one extremity of the spring being connected with the shaft and the other with the roller, means operated from a ground-wheel for storing power in the spring to actuate the roller, suitable means for locking the roller against movement in response to the power of the spring, and means for releasing the stored power at suitable intervals to actuate the roller.

7. In a hay-rake the combination with ground-wheels, of a shaft on which said wheels are journaled, a frame mounted on the shaft, a roller journaled on the shaft and provided with rake-teeth, a coil-spring surrounding the shaft and concealed by the roller, one end of the spring being connected with the shaft and the other end with the roller, a ratchet-wheel fast on the shaft, and a dog mounted on one of the ground-wheels and adapted to engage the ratchet-wheel as the ground-wheel travels, whereby power is stored in the spring to actuate the roller.

8. In a hay-rake the combination with ground-wheels, of a shaft on which said wheels are journaled, a frame mounted on the shaft, a roller journaled on the shaft and provided with rake-teeth, a coil-spring surrounding the shaft and concealed by the roller, one end of the spring being connected with the shaft and the other end with the roller, a ratchet-wheel fast on the shaft, a dog mounted on one of the ground-wheels and adapted to engage the ratchet-wheel as the ground-wheel travels, whereby power is stored in the spring to actuate the roller, another ratchet-wheel fast on the shaft, and a dog engaging the said wheel to prevent the release of the stored power.

9. In a hay-rake the combination with

ground-wheels, of a shaft on which said wheels are journaled, a frame mounted on the shaft, a roller journaled on the shaft and provided with rake-teeth, a coil-spring surrounding the shaft and concealed by the roller, one end of the spring being connected with the shaft and the other end with the roller, a ratchet-wheel fast on the shaft, a dog mounted on one of the ground-wheels and adapted to engage the ratchet-wheel as the ground-wheel travels, whereby power is stored in the spring to actuate the roller, another ratchet-wheel fast on the shaft a dog engaging the said wheel to prevent the release of the stored power, and means for locking the roller against movement in response to the power stored in the spring.

10. In a hay-rake the combination with ground-wheels, of a shaft on which said wheels are journaled, a frame mounted on the shaft, a roller journaled on the shaft and provided with rake-teeth, a coil-spring surrounding the shaft and concealed by the roller, one end of the spring being connected with the shaft and the other end with the roller, a ratchet-wheel fast on the shaft, and a dog mounted on one of the ground-wheels and adapted to engage the ratchet-wheel as the ground-wheel travels, whereby power is stored in the spring to actuate the roller, and a suitable device supported in proximity to the ratchet-wheel for holding the dog disengaged from the ratchet-wheel during a portion of its revolution.

11. In a hay-rake the combination with ground-wheels of a shaft on which said wheels are journaled, a frame mounted on the shaft, a roller journaled on the shaft and provided with rake-teeth, a coil-spring surrounding the shaft and concealed by the roller, one end of the spring being connected with the shaft and the other end with the roller, a ratchet-wheel fast on the shaft, and a dog mounted on one of the ground-wheels, and adapted to engage the ratchet-wheel as the ground-wheel travels, whereby power is stored in the spring to actuate the roller, and suitable means for disengaging the dog from the ratchet-wheel at suitable predetermined intervals.

12. In a hay-rake the combination with ground-wheels, of a shaft on which said wheels are journaled, a frame mounted on the shaft, a roller journaled on the shaft and provided with rake-teeth, a coil-spring surrounding the shaft and concealed by the roller, a ratchet-wheel fast on the shaft, a dog mounted on one of the ground-wheels and adapted to engage the ratchet-wheel as the ground-wheel travels, whereby power is stored in the spring to actuate the roller, suitable means for locking the roller against movement in response to the power stored in the spring, and suitable means for disengaging the dog from the ratchet-wheel at suitable predetermined intervals, comprising a stationary disk located adjacent the ratchet-wheel and provided with a cam formed on a portion of its periphery and projecting beyond the ratchet-teeth, the

arrangement being such that when the dog engages said cam it is disconnected from the ratchet-wheel.

13. In a hay-rake the combination with
5 ground-wheels, of a shaft on which said wheels
are journaled, a frame mounted on the shaft,
a roller journaled on the shaft and provided
with rake-teeth, a coil-spring surrounding the
shaft and concealed by the roller, a ratchet-
10 wheel fast on the shaft, a dog mounted on one
of the ground-wheels and adapted to engage
the ratchet-wheel as the ground-wheel trav-
els, whereby power is stored in the spring to
actuate the roller, suitable means for locking
15 the roller against movement in response to
the power stored in the spring, suitable
means for disengaging the dog from the

ratchet-wheel at suitable predetermined in-
tervals, comprising a stationary disk located
adjacent the ratchet-wheel and provided with 20
a cam formed on a portion of its periphery
and projecting beyond the ratchet-teeth, the
arrangement being such that when the dog
engages said cam it is disconnected from the
ratchet-wheel, and a suitable auxiliary cam- 25
disk member located adjacent the stationary
disk and adjustable to vary the length of the
cam to be engaged by the dog.

In testimony whereof I affix my signature
in presence of two witnesses.

ERNEST V. SWERN.

Witnesses:

DORA C. SHICK,
FRED. W. PARKS.