

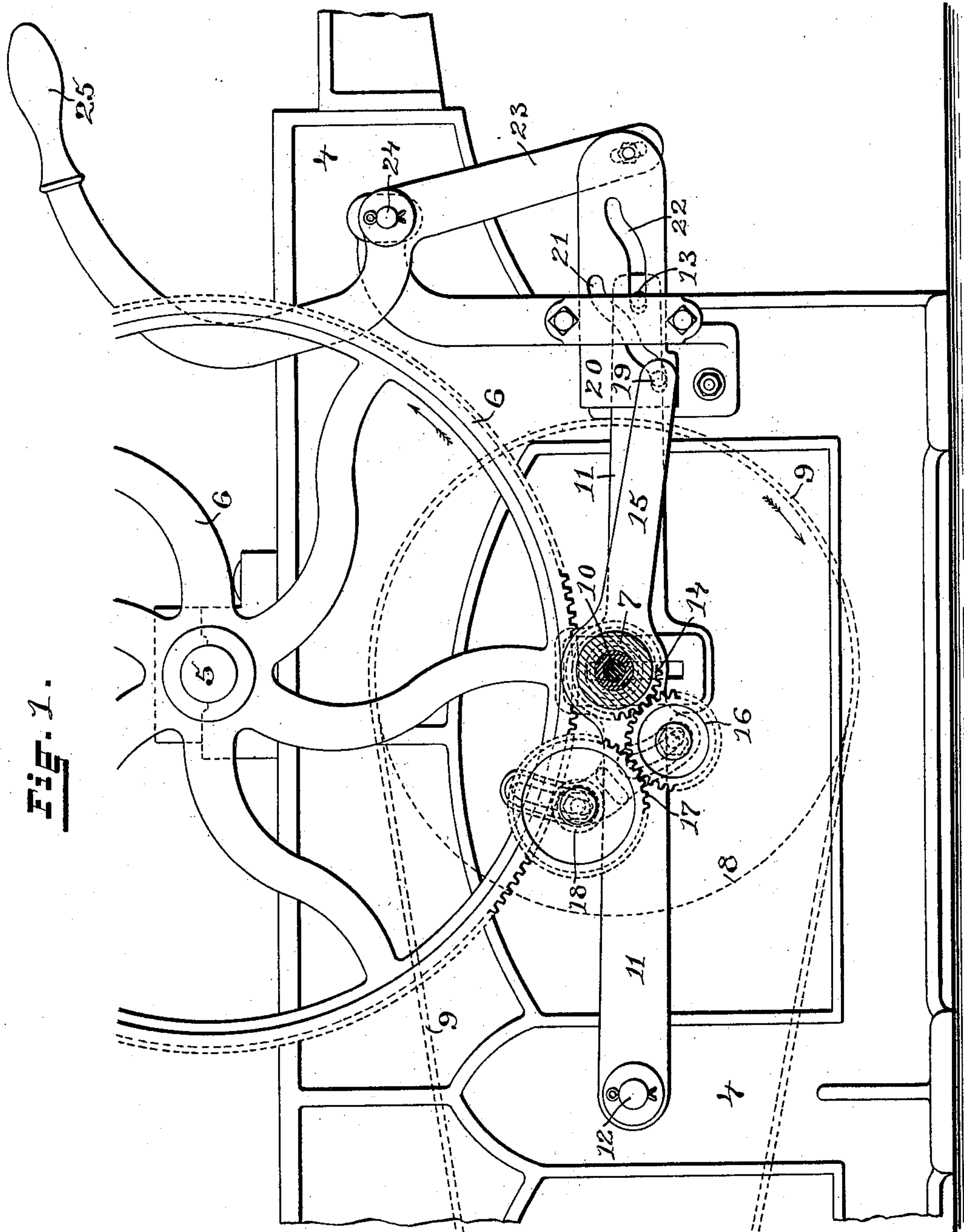
(No Model.)

2 Sheets—Sheet 1.

C. E. SMITH.  
CARDING MACHINE.

No. 599,067.

Patented Feb. 15, 1898.



**WITNESSES:**

*M. Rawdon.*

*Chas. M. Munford.*

**INVENTOR:**

*Cyrus E. Smith*  
*by Joseph A. Miller & Co.*  
*Attys.*

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Fig. 2.

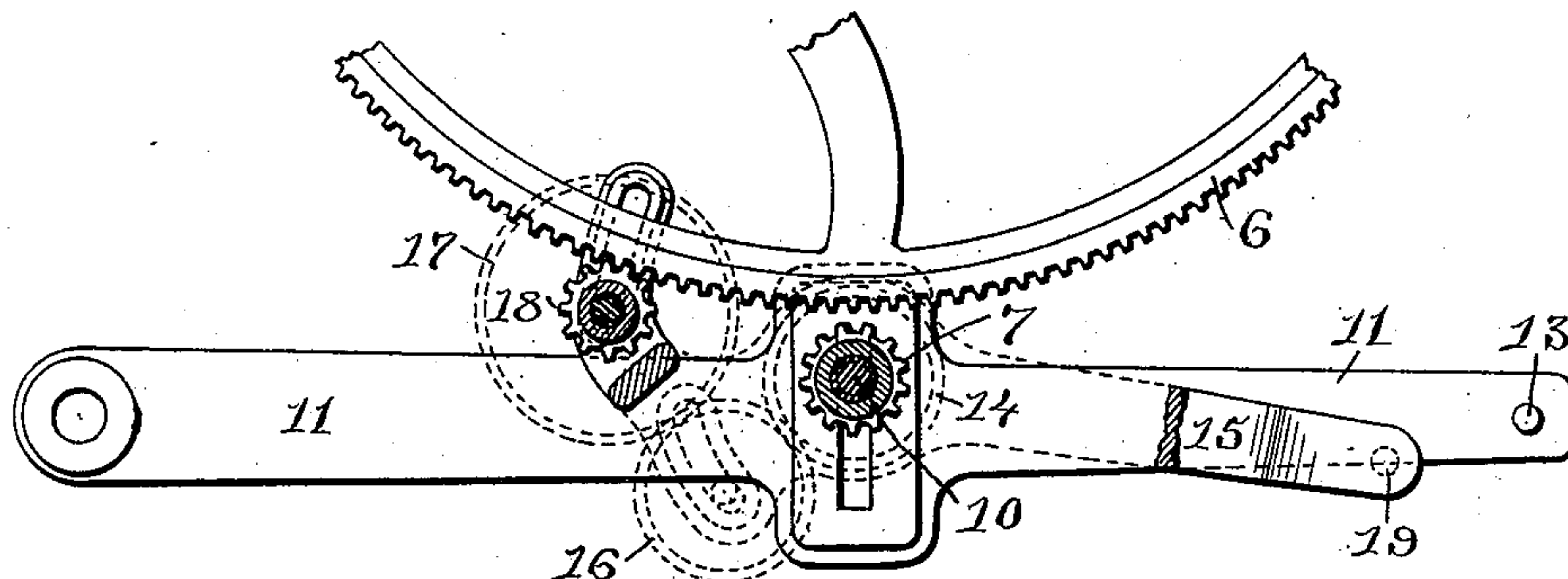
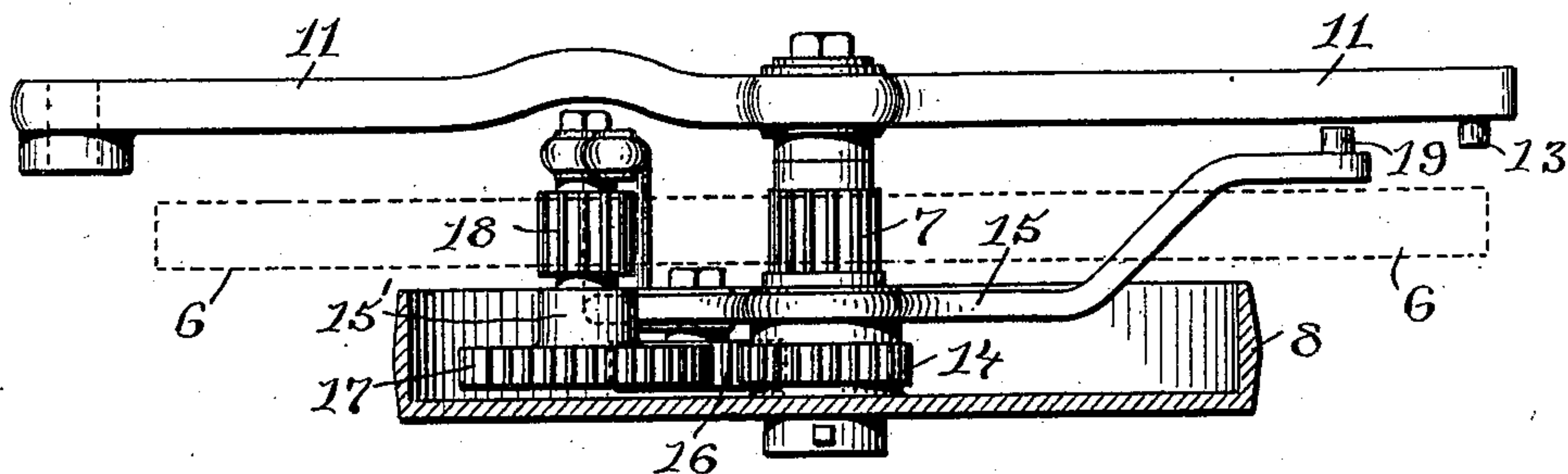


Fig. 3.



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M. Cawdon.  
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**INVENTOR:**

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# UNITED STATES PATENT OFFICE.

CYRUS E. SMITH, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR TO THE  
WHITIN MACHINE WORKS, OF WHITINSVILLE, MASSACHUSETTS.

## CARDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,067, dated February 15, 1898.

Application filed August 30, 1897. Serial No. 649,929. (No model.)

*To all whom it may concern:*

Be it known that I, CYRUS E. SMITH, of Fall River, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Carding-Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

10 In a carding-machine the fiber after it has been subjected to the actions of the main carding-cylinder and the flats or the working rolls is taken off from the main cylinder by a cylinder known in the art as the "doffer" and  
15 is taken off from the doffer in the form of a continuous sheet of fleece. This fleece passes between the calender-rolls and through a condensing-trumpet to an evener or to the railway, by which the product of several carding-  
20 machines is delivered to a railway-head. When a carding-machine is started, the fleece, commonly called the "sliver," must be connected with the sliver of the railway or with the evener.

25 In carding-machines as heretofore constructed the sliver delivered by the doffer accumulates so rapidly that it becomes difficult to piece up the sliver with sufficient rapidity to prevent the accumulation of the same.

30 The object of this invention is to provide means for regulating the speed of the doffer and the delivery of the sliver.

35 The invention has reference to a speed-changing device for the doffer of a carding-engine; and it consists in the peculiar and novel construction of operating-levers and gears, by which the speed of the doffer can be readily changed.

40 In illustrating my invention I have shown a construction which I have found in practice to produce the desired result. I do not wish to confine myself to the exact construction shown and described, as the same may be altered in some of its parts without materially  
45 changing the operation of the same.

50 Figure 1 is a side view of part of the delivery end of a carding-machine, showing the speed-changing mechanism in connection with the pinion-gear, usually called the "barrow-wheel," which engages with the gear on the shaft of the doffer. Fig. 2 is a side view, partly in section and partly in broken lines,

showing the gears connected for slow speed. Fig. 3 is a plan view of the change-gear arrangement.

Similar numerals of reference indicate corresponding parts in all the figures.

55 In the drawings, 4 indicates the side frame of the carding-machine; 5, the doffer-shaft; 6, the doffer-gear; 7, the barrow-wheel secured to or forming part of the hub of the pulley 8, which is driven by the belt 9 usually from a pulley on the shaft of the licker-in on the other end of the carding-machine; 10, the stud on which the pulley 8 and the barrow-wheel revolve. Instead of securing the stud  
60 10 in a fixed position I secure the same to the arm 11 and pivot this arm at one end to the stud 12, projecting from the frame 4, and provide the other end of the arm with the pin 13.  
65 On the hub of the pulley 8 the gear 14 is formed or secured. The lever 15 is provided with a hole fitting on the hub of the pulley 8, so as to give the lever a pivotal support on the hub. The end of the lever 15 (indicated  
70 as 15') is provided with slotted ways, in one of which is adjustably secured a stud on which the gear 16 is journaled, and in the other a stud supporting the gear 17 and the pinion 18 is adjustably secured. The pinion 18 and  
75 80 the barrow-wheel 7 are in line with the doffer-gear 6 and either can be engaged with the gear. When the barrow-wheel 7 is in engagement, the doffer is driven at full speed, and when the pinion 18 is in engagement the doffer  
85 will be driven at slow speed, because the gear 17 is larger than the gear 14 and the pinion 18 is smaller than the barrow-wheel 7.

The lever 15 is provided with the pin 19. The slide 20 has the cam-slots 21 and 22. The  
90 pin 13 on the arm 11 enters the cam-slot 22, and the pin 19 on the lever 15 the cam-slot 21. The slide 20 is connected with the lower end of the actuating-lever, which is pivoted on the stud 24. As shown in the drawings,  
95 the slide 20 is driven out, the pins 13 and 19 are at the lower ends of the cam-slots, the arm 11 and lever 15 are depressed at the ends connected with the slide 20, the barrow-wheel  
100 7 is out of engagement, and the pinion 18 is in engagement with the doffer-gear, so that the doffer is rotated at the slow speed at which the piecing up of the sliver is readily effected. When the piecing up is effected, the handle



25 of the actuating-lever is depressed and the slide 20 is pushed in, and the pins 13 and 19 follow the cam-slots 21 and 22 and raise the ends of the arm 11 and lever 15, to which they are  
5 connected. The curves of the cam-slots are formed so that on moving the slide inward the lever 15 is operated to disengage the pinion 18 before the arm 11 raises the barrow-wheel into engagement with the doffer-gear,  
10 and on moving the slide 20 outward the barrow-wheel will be disengaged before the pinion 18 engages with the doffer-gear 6.

The change of the speed of the doffer from the quick to the slow speed and back from  
15 the slow to the quick speed may be made quickly at any time desired without interfering with the continuous operation of the carding-engine.

Having thus described my invention, I  
20 claim as new and desire to secure by Letters Patent—

1. In a carding-machine, the combination with the doffer-gear, the barrow-wheel and the pulley by which the barrow-wheel is rotated, of an arm pivotally secured at one end,  
25 a stud projecting from the arm and forming the journal-support of the barrow-wheel and the pulley, a lever pivotally supported on the hub of the pulley, a gear on the hub, an intermediate gear, a gear engaging with the  
30 intermediate gear, a pinion in line with the doffer-gear, and means, substantially as de-

scribed, for moving the arm and lever to connect the pinion with the doffer-gear and disconnect the barrow-wheel or vice versa to  
35 change the speed of the doffer, as described.

2. In a carding-machine, the combination with the doffer-gear, the barrow-wheel, an arm, a stud on the arm forming the movable support of the barrow-wheel and the driving-  
40 pulley, of a pinion in line with the doffer-gear journaled on a lever, the lever, gears, and means, substantially as described, for moving the arm and lever to connect the pinion with the doffer-gear, whereby the barrow-  
45 wheel may be disconnected from the doffer-gear, and the pinion connected therewith to change the speed of the doffer, as described.

3. In a carding-engine, the combination with the doffer-gear 6, the pulley 8 and the  
50 barrow-wheel 7 connected with the pulley, of the arm 11 pivotally connected at one end to the frame, the frame 4, the stud 10 secured to the arm 11, the lever 15, the gears 14, 16 and 17, and the pinion 18, the slide 20 pro-  
55 vided with the cam-slots 21 and 22, and the actuating-lever 23; whereby the speed of the doffer may be varied, as described.

In witness whereof I have hereunto set my hand.

CYRUS E. SMITH.

Witnesses:

JOSEPH A. MILLER, Jr.,  
MOLLIE RANDON.