

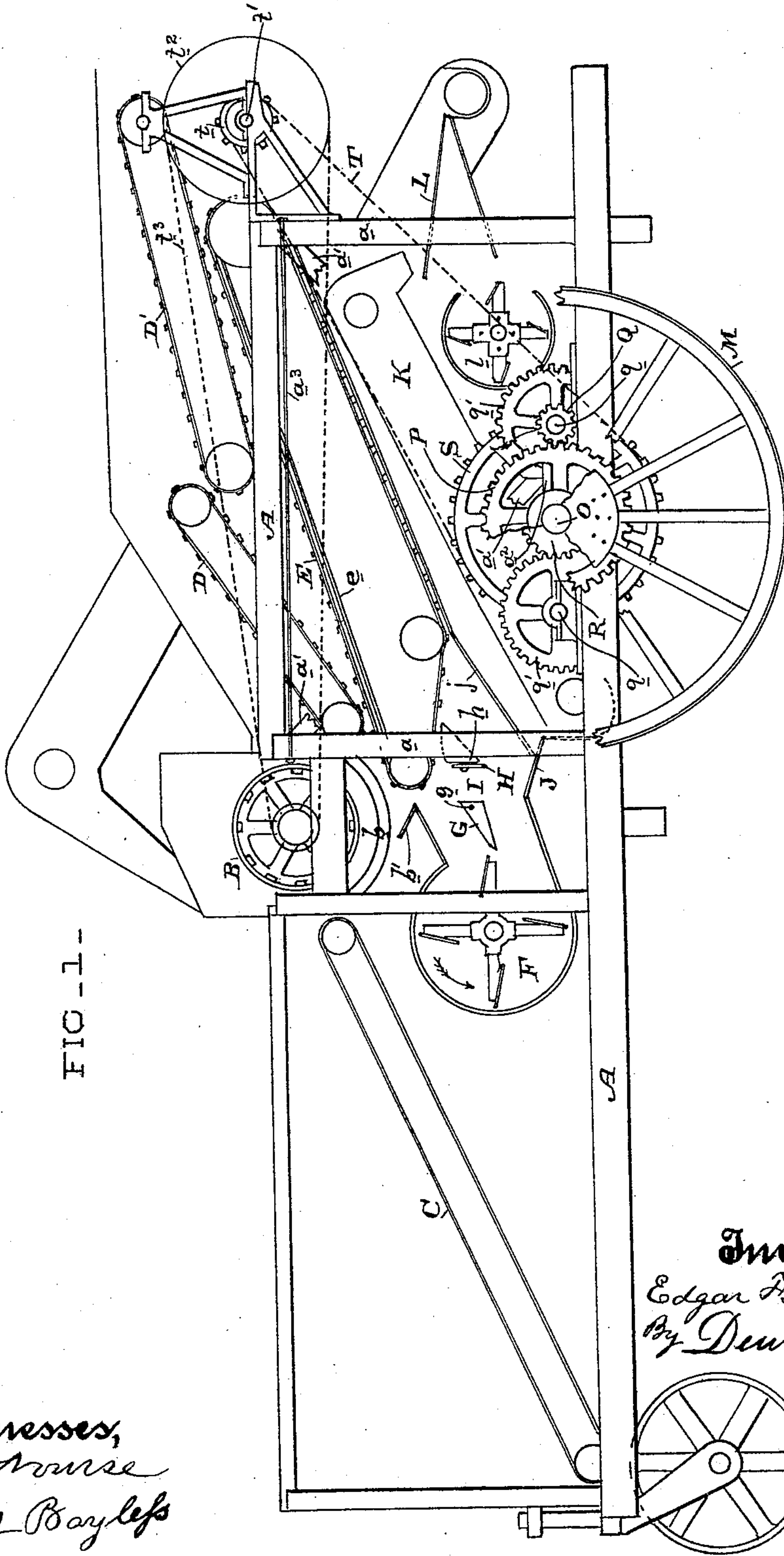
(No Model.)

4 Sheets—Sheet 1.

E. F. SANFORD.  
THRASHER.

No. 454,230.

Patented June 16, 1891.



Witnesses,  
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J. A. Bayless

Inventor,  
Edgar A. Sanford  
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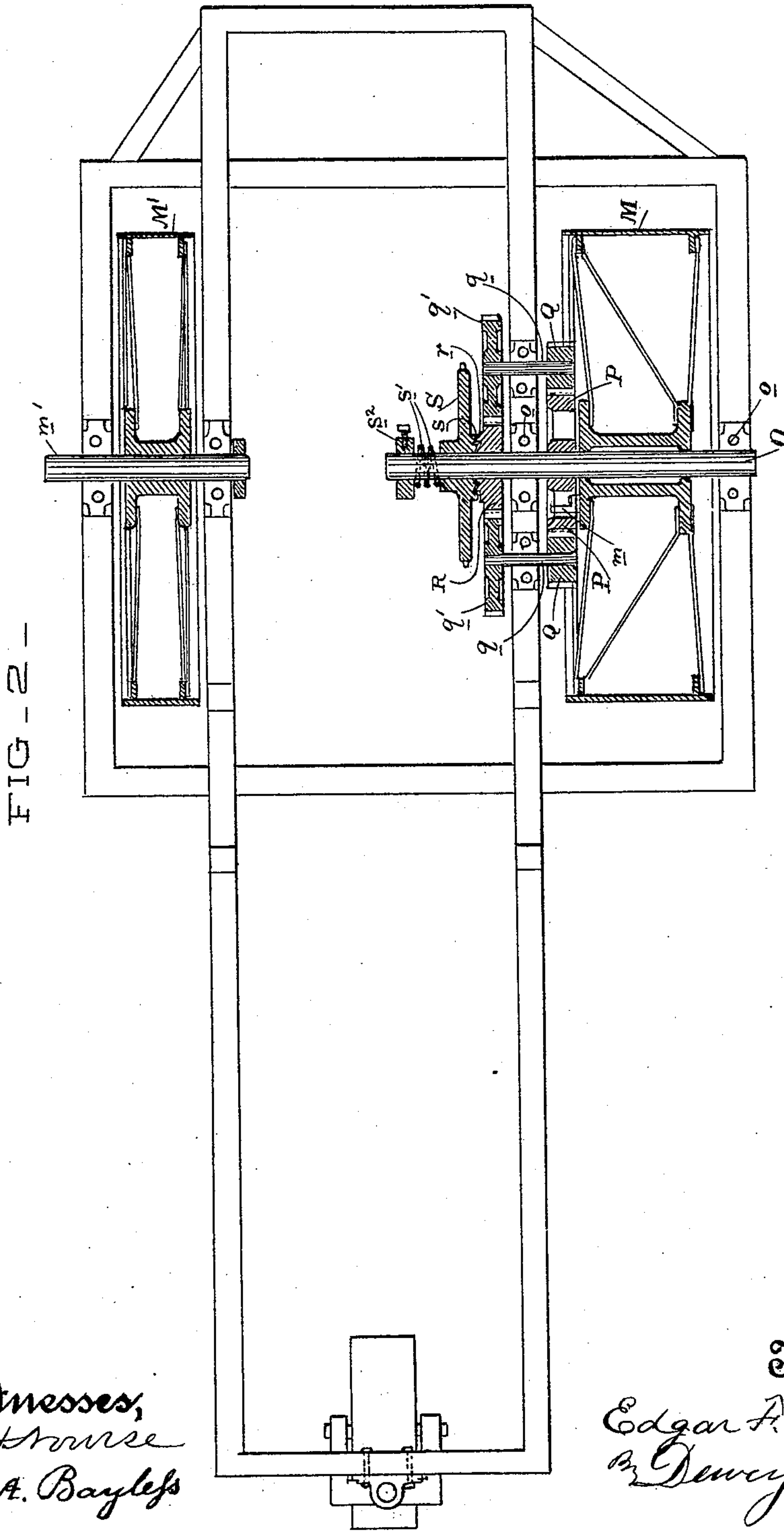
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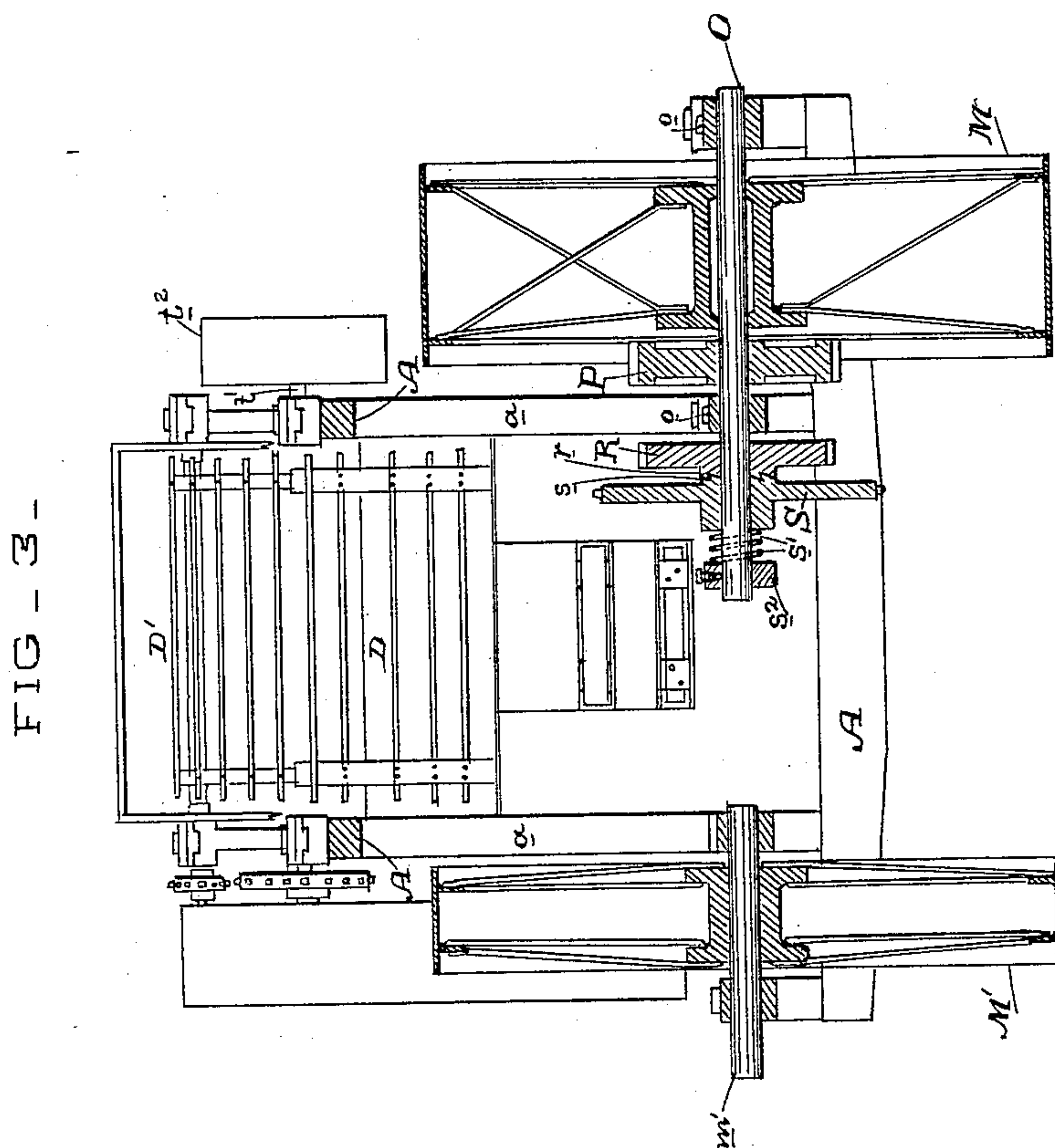
(No Model.)

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(No Model.)

4 Sheets—Sheet 4.

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Fig- 4-

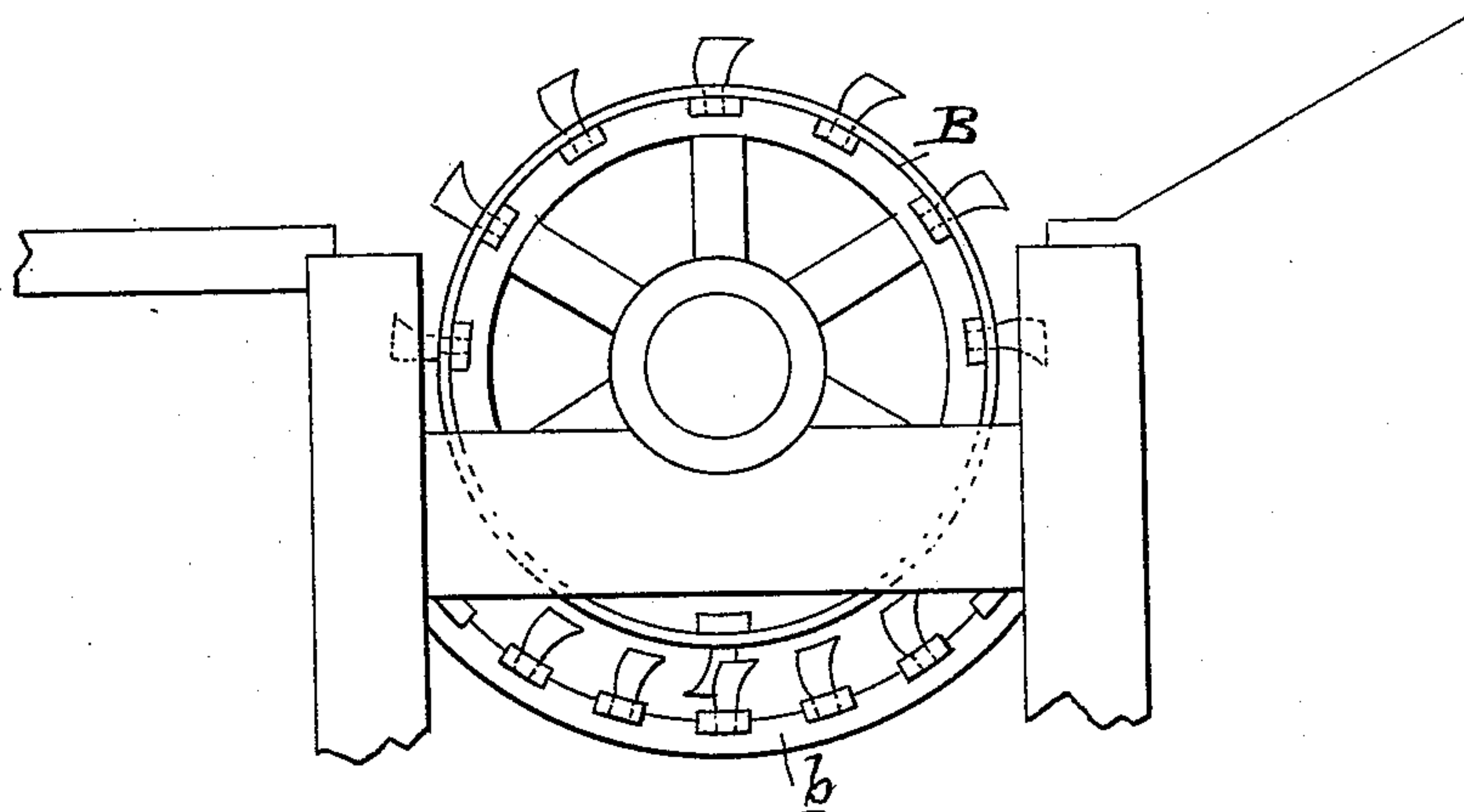
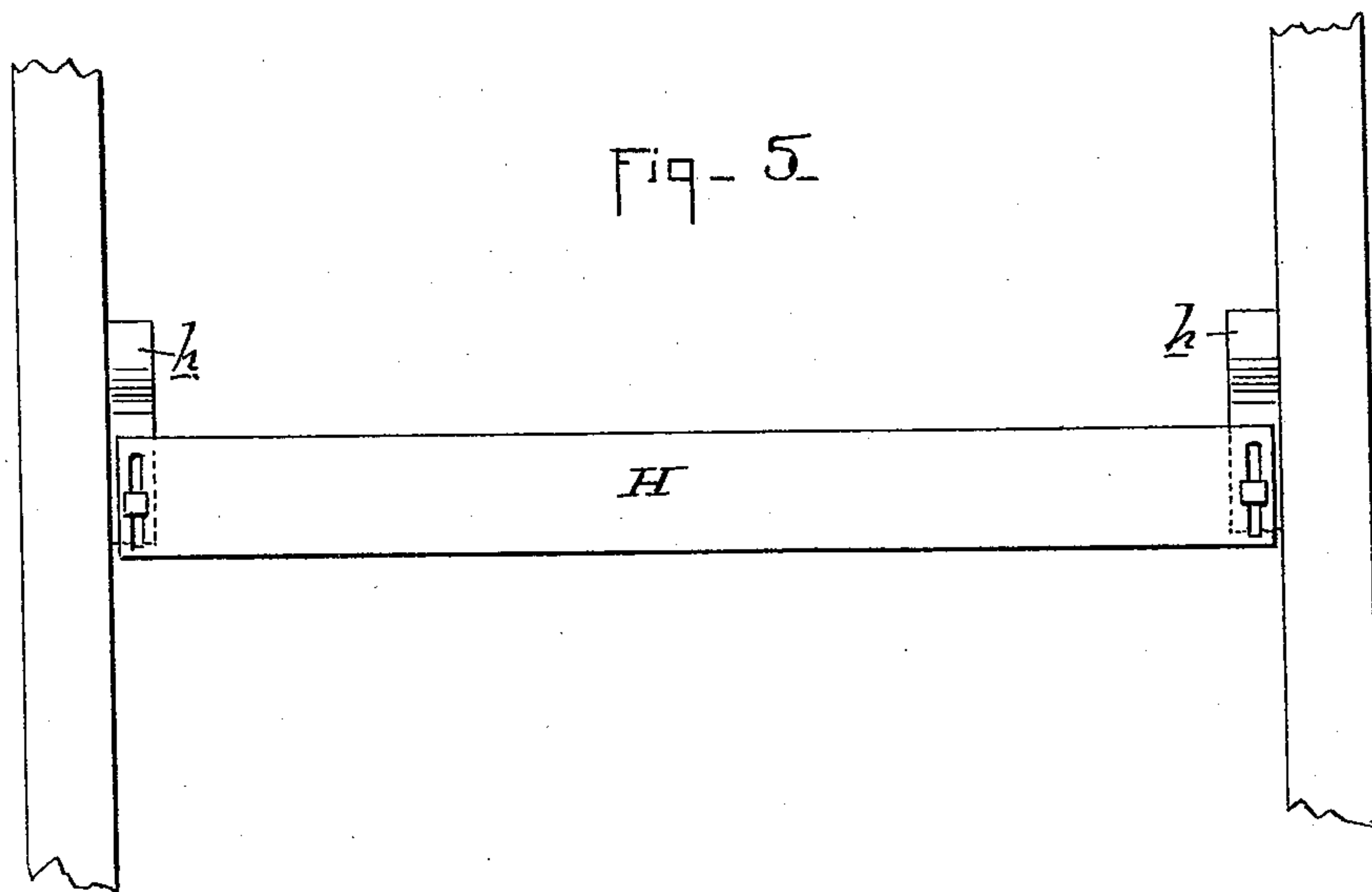


Fig- 5



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# UNITED STATES PATENT OFFICE.

EDGAR F. SANFORD, OF MERCED, CALIFORNIA.

## THRASHER.

SPECIFICATION forming part of Letters Patent No. 454,230, dated June 16, 1891.

Application filed January 6, 1891. Serial No. 376,905. (No model.)

*To all whom it may concern:*

Be it known that I, EDGAR F. SANFORD, a citizen of the United States, residing at Merced, Merced county, State of California, have  
5 invented an Improvement in Thrashers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the general class of thrashing-machines, and especially to travel-  
10 ing thrashers and to such thrashers as are united with heading-machines and known as "combined harvesters;" and my invention consists of the constructions and combinations of devices, which I shall hereinafter fully de-  
15 scribe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side view of my machine. Fig. 2 is a plan of the power-transmitting  
20 mechanisms. Fig. 3 is an end elevation of the machine. Figs. 4 and 5 are details of construction.

A is the frame of the machine.

B is the cylinder to which the headed grain  
25 is fed by means of a draper C. Under the cylinder is a grated concave *b* (see Fig. 4) and an inclined guide-board *b'*.

D is a straw-carrier, and D' is a second straw-carrier. Under these is a return-car-  
30 rier E, consisting of spaced cross-slats carried by side belts and traveling over a plate *e*.

F is a fan adapted to direct its blast into and across the space which is under the cylinder and concave. The rear end of the re-  
35 turn-carrier extends into this space at a point above the fan. Within this space and in front of the fan is an adjustable directing-board G, extending the whole length of the space from side to side of the machine. This directing-  
40 board is pivoted at the point *g*, and by its position it serves to divide the blast of the fan, as will be presently described. It is of a triangular shape, with its wide end away from the fan. Opposing the wide end of this di-  
45 recting-board is a transverse plate H, which is carried by a bearing-piece *h* and is preferably mounted thereon so as to slide up and down, as by means of a screw and slot. (See Fig. 5.) Between this plate and the wide  
50 end of the directing-board is formed a vertical passage I, which is directly below the end of the return-carrier E and the guide-board *b'*

under the concave. Under this passage is an inclined guide-board J, which communicates with the lower end of an elevator K, the up- 55 per end of which is in position to discharge its contents upon the shoe L, of which *l* is the fan.

The directing-board G, as before stated, di-  
60 vides the blast from the fan F, and when this board is about horizontal the greater part of the air is directed under it and passes directly upwardly through the passage I, while a portion of it continues under the plate and a por-  
65 tion over it and beyond it. Now when the point of the directing-board is lowered, more of the air may be directed up past said point and across the upper surface of the board and across the top of the vertical passage I, while a portion still continues below. This adjust- 70 ment of the directing-board, therefore, enables me to carry out its several purposes according to the character of work being done.

The passage I is a confined one, being walled in by the board G and the plate H on the 75 sides, and by the sides of the machine-frame on the ends, but is open top and bottom.

The object of this construction is as follows: A great deal of the grain and chaff is separated from the straw in the grated con- 80 cave, and dropping through said concave is guided directly downwardly by board *b'* into the passage I. Further separation from the straw takes place on the straw-carriers, and the grain and chaff are returned by the 85 carrier E and dropped into the passage I. Thus from the very beginning the separation is taking place of the grain and chaff from the straw. These being dropped into the ver-  
90 tical passage I are met by two main currents of air, the first being the upcurrent directed upwardly through the confined passage I, and which serves to sustain the chaff at the upper end of the passage while allowing the grain, on account of its weight, to fall through onto 95 the guide-board J below. The second current is the one passing above the directing-board and across the path of the falling material, and which serves to blow away the chaff for-  
100 wardly through the spaced slats of the carrier E. Whatever grain may accompany the chaff under the power of the second current of air will fall down upon an inclined return-board *j*, and the chaff will be blown on by the third



or under current, said last-named current being regulated by the adjustment of the plate H, and the former currents relatively regulated by the adjustment of board G.

5 The essential feature in this operation is the confined passage I, into which the grain and chaff are dropped, and the meeting of the material with an upward blast of air in the passage, whereby the chaff is suspended  
10 and is blown away by the cross blast or current. This separation of the chaff from the grain is thorough enough to impose but light work upon the shoe, which does the remaining separation.

15 The construction of the frame A is shown in Fig. 1. The uprights  $a$  are braced by the diagonal braces  $a'$ , of which there are four, two on each side, and two at each end. Two of these are here shown broken away in their  
20 middle portions, their upper ends being secured in the corners of the frame, and their lower ends abutting and resting on a bearing  $a^2$  below. A tie-rod  $a^3$  extends between the upper portions of the uprights on each side,  
25 and serves to tighten the parts. This makes of the entire frame a truss-frame, which greatly strengthens it and permits it to be made lighter.

M is the traction-wheel of the machine, and  
30 M' is the opposing wheel. The latter is mounted loosely on its shaft  $m'$ , which is carried on suitable boxes on that side of the frame.

The traction-wheel M is mounted loosely  
35 on a fixed shaft O, which does not extend across the frame, but simply has two bearings  $o$  and is a fixed non-rotary shaft. Upon this shaft is also mounted freely a large gear P, which derives rotation from the wheel by  
40 means of arms  $m$ , which are firmly secured to the wheel and extend between the spokes of the gear. The gear meshes on each side with a small pinion Q on counter-shafts  $q$ , which extend inwardly, and each carries a gear  $q'$   
45 on its inner end. On the shaft O is mounted loosely a central gear R, with which the gears  $q'$  mesh, one on each side. This gear R has an inner clutch-face  $r$ , with which the clutch-face  $s$  of a sprocket-wheel S engages, said  
50 wheel being also loose upon the shaft O. The clutches are normally held in engagement by means of a spring  $s'$  held to place by a collar  $s^2$ . From the sprocket-wheel S extends an endless chain T to a sprocket pulley or wheel  $t$  above  
55 and on the same side of the machine. This is carried by a counter-shaft  $t'$ , and on said shaft is a pulley  $t^2$ , from which an endless belt  $t^3$  extends to and drives the cylinder B, all these parts being on one side of the machine.  
60 There are several advantages in this construction. One is that, all the parts being loose on the shaft O, said shaft by removing the collar  $s^2$  on its inner end can be readily taken out, thereby freeing all the parts when it  
65 is necessary to remove them for repairs or the substitution of others. Another is that the strain on the parts is equalized by the

meshing of the gears on each side as the power is transmitted from the center outwardly on each side, and then back again to 70 the center. And still another is that all racking of the frame is avoided by having the power mechanism wholly on one side the frame, and transmitting its force in a line forward and back so that the strain is in the 75 line of the frame-beam on one side.

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

1. In a thrasher, a walled or confined pas- 80 sage open top and bottom and into which the grain and chaff are delivered, a fan, and an adjustable directing-board for dividing the blast of the fan, whereby a portion passes upwardly through the passage and a portion 85 passes transversely across it above, one of the walls of the passages being adjustable, substantially as herein described.

2. In a thrasher, the combination of the adjustable swinging directing-board and the 90 vertically-adjustable plate opposing said board, the two forming an intervening passage, and the fan, the blast of which is divided by said board, substantially as herein described.

3. In a thrasher, the combination of the 95 cylinder, grated concave, straw-carrier, and return-carrier with the adjustable directing-board, the adjustably-secured opposing plate, forming with said board the intervening passage I, and the fan-blower, the blast of 100 which is divided by said board, substantially as herein described.

4. In a thrasher, the combination of the adjustable directing-board and opposing 105 plate, forming between them a vertical passage I, the fan-blower, the blast of which is divided by said board, the inclined guide-board J, the elevator, and the shoe, substantially as herein described.

5. In a thrashing-machine, the frame 110 thereof having the uprights  $a$ , the diagonal braces  $a'$ , and the tie-rods  $a^2$  at the upper ends of the uprights, substantially as herein described.

6. In a thrashing-machine, the traction- 115 wheel and the non-rotary shaft O, on which said wheel is loosely mounted, in combination with the gear loosely mounted on the shaft, the arms connecting the wheel with the gear, the pinions meshing with the gear on 120 each side, the counter-shafts of said pinions, the gears on the inner ends of said shafts, the central gear loosely mounted on the shaft O, and with which the gears on the counter-shafts engage on each side, the sprocket- 125 wheel, and a clutch device between the sprocket-wheel and the gear, substantially as herein described.

7. In a thrashing-machine, the combination of the traction-wheel, the gear connected 130 therewith, the pinions engaging the gear on each side, the counter-shafts of said pinions, the gears of the counter-shafts, the central gear with which said counter-shaft gears en-



5 gage on each side, sprocket-wheel, and a clutch mechanism between said wheel and central gear, and the shaft O, on which the traction-wheel gear, central gear, and sprocket-wheel are loosely mounted, the counter-shaft above having a sprocket-wheel and pulley, the endless chain between the sprocket-wheel on the shaft below and the sprocket-wheel on the counter-shaft above, and the belt between the

pulley and the cylinder of the thrasher, substantially as herein described.

In witness whereof I have hereunto set my hand.

EDGAR F. SANFORD.

Witnesses:

FRANK HAWELL,  
WILLIAM McDONALD.