

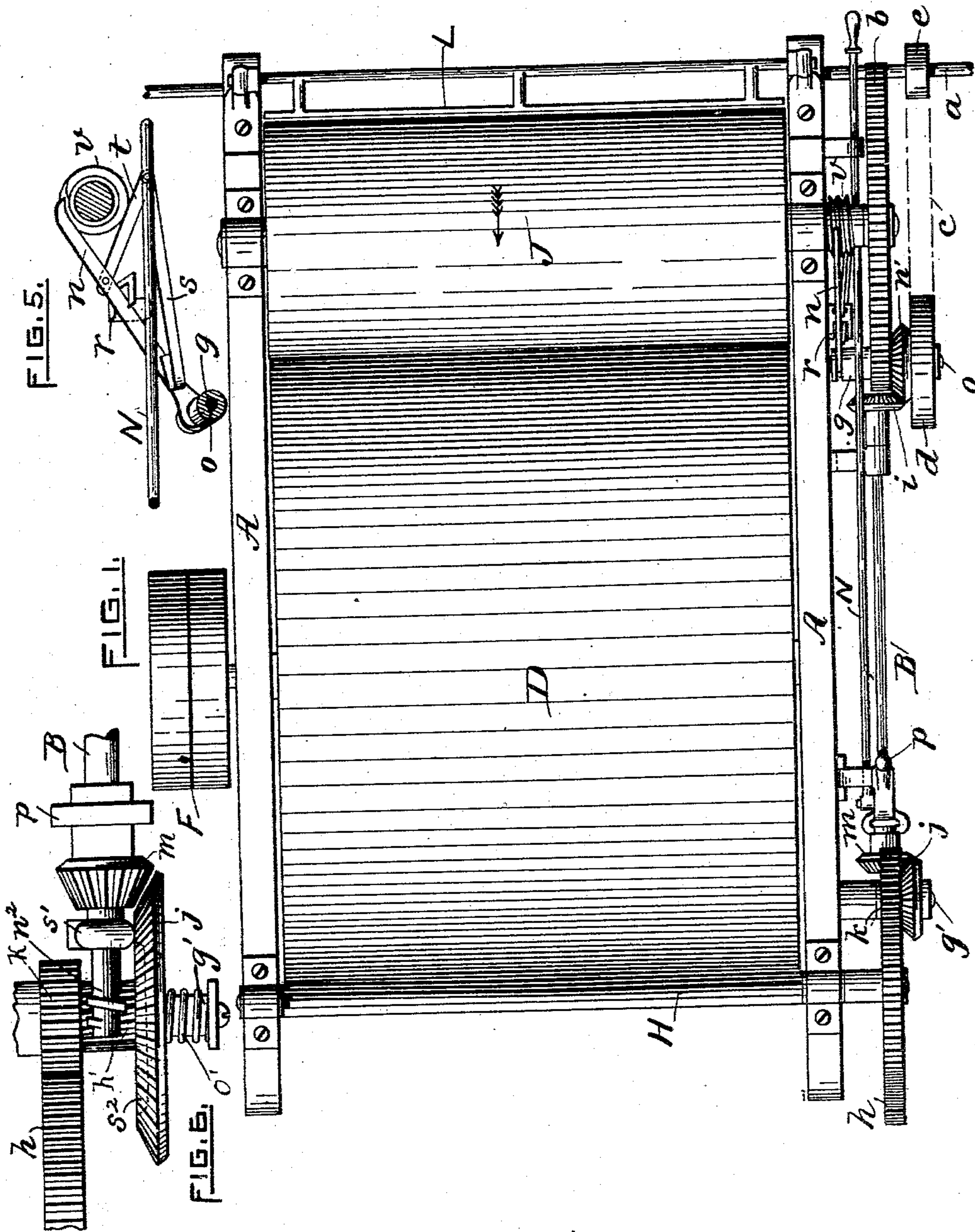
(No Model.)

2 Sheets—Sheet 1.

J. P. THOMPSON.  
CARDING MACHINE.

No. 556,872.

Patented Mar. 24, 1896.



WITNESSES.

*Charles Hamigan.*  
*J. P. Bush*

INVENTOR.

*John P. Thompson.*  
*By Benj. Arnold*  
*Atty.*

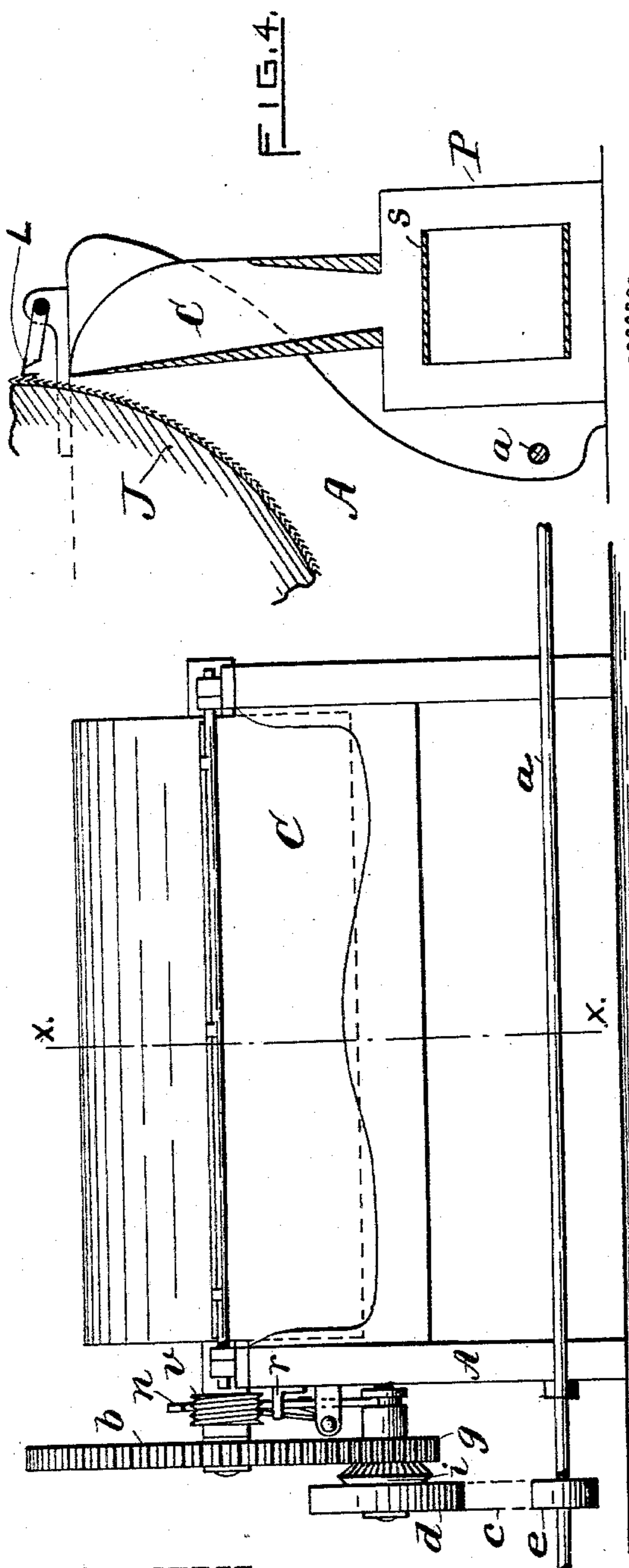
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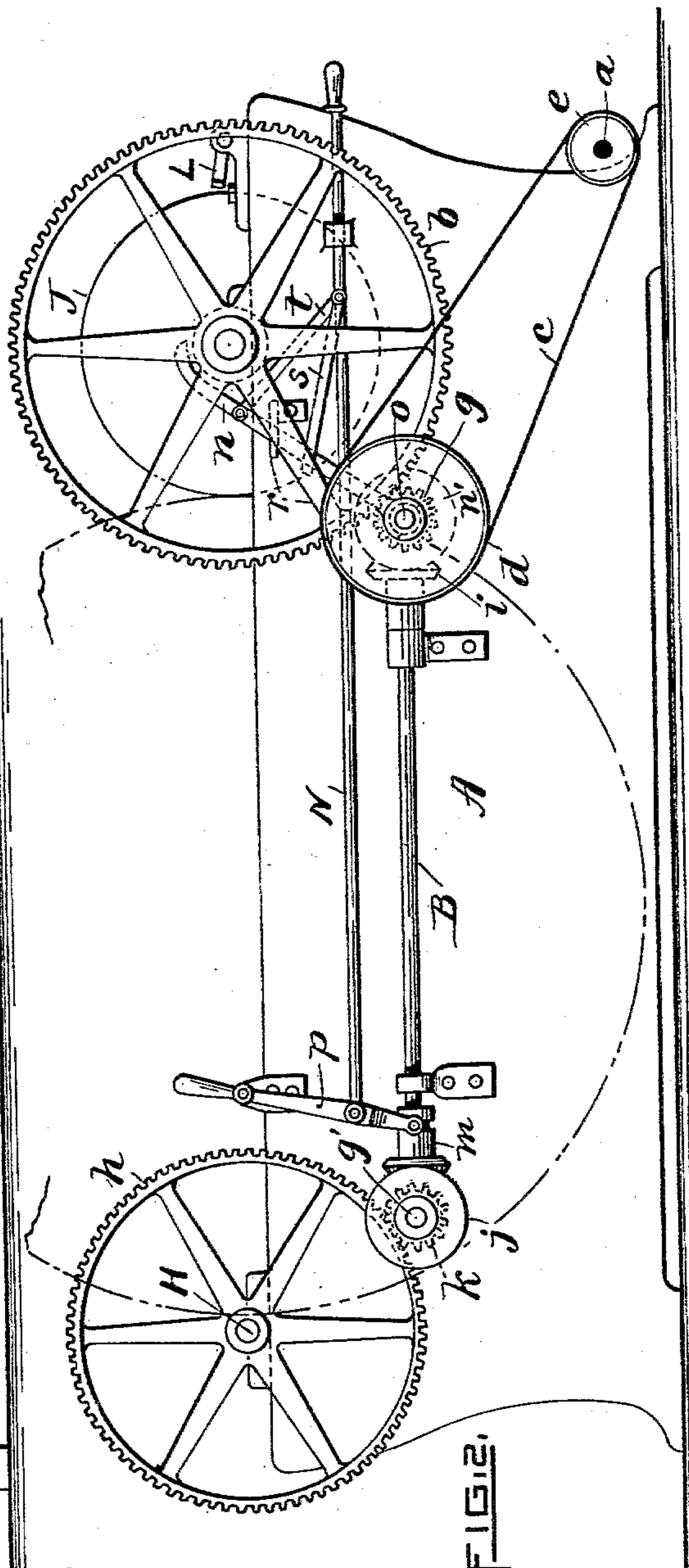


FIG. 3.

INVENTOR.

*John P. Thompson*  
*By Benj. Arnold*  
*Atty.*

# UNITED STATES PATENT OFFICE.

JOHN P. THOMPSON, OF PROVIDENCE, RHODE ISLAND.

## CARDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,872, dated March 24, 1896.

Application filed February 28, 1895. Serial No. 539,967. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN P. THOMPSON, of Providence, in the county of Providence and State of Rhode Island, have invented certain  
5 new and useful Improvements in Carding-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of  
10 reference marked thereon, which form a part of this specification.

My invention relates to carding-machines in connection with railways and railway-heads.

15 It is fully explained and illustrated in this specification and the accompanying drawings.

Figure 1 represents a top view of the carding-machine with all the parts above the main cylinder, feed-rolls, and doffer-cylinder removed. Fig. 2 is a side elevation of the carding-machine as shown in Fig. 1. Fig. 3 is an  
20 end view of the same, looking from the railway. Fig. 4 is a vertical section of the doffer comb and chute on line *xx*, Fig. 3. Fig. 5  
25 is a representation of the stopping and starting mechanism of the doffer-cylinder, the outer wheels being removed. Fig. 6 shows a modification of the mechanism for operating the feed-rolls and starting them slowly.

30 The use of the railway system of connecting a set of cards with a drawing or railway head has an objection so serious that many prefer to use a system of separate cans with  
35 coilers, one for each card, to receive the sliver, and have employes to carry these cans and cotton to the railway-head. This objection is that when one of the cards is stopped for stripping the speed of the delivery-rolls of the  
40 railway-head cannot be changed quickly enough to account for the loss of the sliver of that card. For example, if there are eight cards in the set, and one is stopped for stripping, there will be one less sliver on the railway, and when the end of that sliver passes  
45 the delivery-rolls the roving will be one-eighth smaller, and owing to the speed of those rolls a considerable length of the reduced roving will pass before that speed can be reduced by the evener to accommodate for  
50 the loss of the sliver and bring the roving up to full size again. In starting up the card again and piecing on the sliver the change in

the size of the roving will vary still more in the other direction, for when the end of the pieced sliver reaches the delivery-rolls they  
55 will be running on seven slivers, and the evener will have reduced their speed properly for that amount of cotton; but on the addition of the pieced sliver the size of the roving will be increased one-seventh, and a portion  
60 will be delivered so much above the regular size before the evener can bring the speed of the rolls back again. By this it will readily be seen that the abrupt ending and starting of the sliver is the cause of the trouble. This  
65 I remedy by stopping off the sliver gradually and tapering the end down to nothing, and when the card is started up again beginning the sliver at nothing and gradually increasing it to full size, giving the evener ample time  
70 to make the required change as the sliver decreases or increases and keep the roving of an even uniform size. I accomplish this by providing means for stopping the feed-rolls of the card before the doffer-roll is stopped  
75 and carding out all the cotton left in the machine when the feed-rolls were stopped in a gradually-decreasing sliver until all the cotton is delivered and the sliver has tapered  
80 down to nothing. Then the machine is stripped of the waste cotton, and when started up again the sliver delivered will begin at nothing and increase in size while the card is filling up with cotton until it is full and the  
85 sliver of same size as before stopping. As before described, when these changes in the sliver reach the delivery-rolls the evener will have ample time to accommodate the rolls to the tapering ends of the sliver and keep the  
90 roving of even size. Another important object is gained in this method, which is this: When a card is stopped in the usual way for stripping, it is full of good cotton, which is all stripped out and thrown into the waste  
95 with the strippings, while in my way, as described, all the good cotton in the card is run out in the tapering portion of the sliver and goes into the roving instead of the waste.

The mechanism for accomplishing my object is as follows:

A represents the body or case of the machine; D, the main cylinder; H, the feed-rolls; J, the doffer-cylinder.

B is a light horizontal shaft held in bear-

ings attached to the side of the machine-frame for the purpose of connecting the feed-rolls and the doffer-cylinder, and has a bevel-gear *i* fast on one end and a bevel-gear *m* sliding on a spline on its other end.

*a* is the railway-shaft that drives the doffer-cylinder and the feed-rolls by means of a belt *c* and pulleys *d* *e* and intermediate gear-wheels. The main cylinder and other parts are driven by a belt on the pulley *F* on the other side of the machine. A large gear-wheel *b*, fast on the shaft of the doffer-cylinder, engages with a small gear-wheel *g*, secured to the bevel-gear *n'* and pulley *d*, all three of which turn together on a stud *o* fast to the machine-frame. A large gear-wheel *h*, fast on one of the feed-rolls *H*, engages with a small gear-wheel *k*, secured to the bevel-gear-wheel *j*, the two turning on a stud *g'*, also held in the side frame. A rod *N* for starting and stopping the feed-rolls and doffer-cylinder is held to slide in bearings fast on the side of the machine. The front end of this rod *N* is pivoted to a vertical lever *p*, held on a pivot in a bracket on the side of the machine. The lower end of this lever is made forked and fitted into an annular groove in the hub of the gear *k*, so that by pulling or pushing the rod *N* by the handle on its outer end the gear *m* may be drawn out of engagement with the bevel-gear *j* or made to engage with it to stop or start the feed-rolls. The stopping and starting may also be done by working the lever *p* by the handle on its upper end. The stopping and starting of the doffer-cylinder by the rod *N* is effected by means of an inclined lever *n*, the lower end of which is made forked and fitted into an annular groove in the hub of the gear-wheel *g*, so that the gear *g* can be disengaged from the gear *b* by sliding it with the bevel-gear *n'* and pulley *d* a little distance out on the stud *o*. The lever *n* is held about midway up of its length in a slot in a bracket *r* fast on the side of the machine, the bracket serving as a fulcrum for the lever. The upper end of the lever *n* is arranged to be drawn down into a worm-wheel *v* fast on the hub of the gear *b* when the rod *N* is drawn back to the right by the connecting-bar *t*, fast at one end to the lever *n* and at the other end to the rod *N*.

A bar *s* having its inner end bent into a *V* shape has its back end attached to the rod *N* and so placed that when the rod is pushed to the left to start the doffer-cylinder the *V*-shaped end will push the lower end of the lever *n* back toward the machine and move the gear *g* by the fork into engagement with the gear *b* to start it, and at the same time the bar *t* will throw the upper end of the lever *n* up out of the worm-wheel *v*.

The operation of the above-described mechanism is as follows: The pulley *d* and gear-wheels *n'* *g* are driven by a belt from the pulley *e* on the shaft *a*. When it is desired to strip the card of the waste, the rod *n* is drawn back, which, by means of the lever *p*, slides

the bevel-gear *m* out of engagement with the gear *j*, and the feed-rolls *H* instantly stop feeding the cotton into the machine. At the same time the bar *t* will draw the upper end of the lever *n* down into the worm-wheel *v*, which will slowly carry that end of that lever in and the lower forked end out from the card, and in the course of two or three turns of the doffer-cylinder and the worm the lower end of the lever *n* will have moved the gear *g* out of engagement with the gear *b*, and then the doffer-cylinder will stop; but between the stopping of the feed-rolls and the stopping of the doffer-cylinder all the good cotton in the card has been gradually worked out into the tapering end of the sliver, as before described.

In starting up after stripping the rod *N* is pushed in from the end and the gear *m* slid into engagement with the gear *j*, and then the feed-rolls *H* will start to feed in the cotton. The doffer-cylinder is started at the same time by the bar *s* pushing the lower end of the lever *n* in by its *V*-shaped end, which moves the gear *g* into engagement with the gear *b* on the doffer-cylinder shaft. As the machine gradually fills up with cotton again, the sliver will begin at nothing and gradually increase to full size as the machine becomes full of cotton. In this way the tapering of the ends of the sliver is accomplished, upon which the evenner mechanism depends for time to make its changes.

To provide for the joining of the sliver to the railway-belt *S* when the carding begins after stopping, when, as before stated, the sliver, starting from nothing, is for some little distance from its end too light to follow down the ordinary tapering chute without lodging on its sloping sides, I make the chute about the full width of the doffer-comb clear to the railway-belt *S*, so that the end of the sliver, however light and thin it may be, can drop from the comb directly down onto the railway-belt to be carried along with it, thus doing away with all piecing by hand, the boys employed to do it, and the waste of good cotton usual in that operation. I put a stationary apron *C* at the back of the chute directly under the outer periphery of the doffer-cylinder and make its upper edge thin and sharp, that as the doffer-comb *L* vibrates up and down to comb off the sliver it beats the sliver against the thin edge of the apron and causes it to scrape off the motes and refuse, so that they will drop down back of the apron and not get into the roving, as is usually the case.

In Fig. 6 is shown an arrangement of the feed-roll driving-gear to give them a slower starting motion to lengthen out the taper of the sliver in starting up when necessary, as in stopping the sliver and starting without stripping. It consists in putting a worm-gear *h'* in front of gear *k* and fast to it, and putting the bevel-wheel *j* on the hub of the worm-wheel with a spline so it can slide in and out a little way, with a spiral spring *o'* on the stud *g'* to push the bevel-gear *j'* into engage-

ment with the bevel-gear  $m$ . A worm  $n^2$  is put on the hub of the gear  $m$ , and a swell or boss  $s'$  is put between the bevel-gear and the worm.

5 The operation is as follows: When the rod N is pushed in to start the doffer-cylinder and feed-rolls, it is pushed in only far enough for the worm  $n^2$  to catch into the worm-gear  $h'$  and turn it and the feed-rolls slowly for a  
10 short time. Then the rod N is pushed clear in, or the worm  $n^2$  is allowed to draw the gear  $m$  in until the boss  $s'$  on the hub of that gear which has held the gear  $j$  away from engaging with gear  $m$  reaches an annular recess  $s^2$   
15 made in the inner face of the gear  $j$ , and by entering the recess allows the gear  $j$  to be pushed into engagement with the gear  $m$  by the spiral spring  $e'$  and start the feed-rolls up to full speed. When the boss  $s'$  has fully en-  
20 tered the annular recess  $s^2$  the worm  $n^2$  will have overrun the worm-gear  $h'$  and the two will be free of each other. While the feed-rolls are run by the worm  $n^2$ , the main cylinder will fill up slowly and the sliver will run  
25 light and gradually increase until the main cylinder is full and the feed-rolls start up at full speed.

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

1. The combination with the feed-rolls of a carding-machine of means for starting them up slowly, consisting of a gear-wheel on one of the rolls, a gear-wheel to engage in it, a worm-gear fast to the latter gear-wheel, a  
35 bevel-gear sliding on the hub of said worm-wheel with a spline to carry it, a smaller sliding bevel-gear to engage with said larger bevel-gear, a worm-wheel on the hub of said  
40 smaller bevel-gear, and a boss on the hub of the smaller gear with a recess to receive said boss on the inner face of the larger bevel-wheel, with means to slip the smaller bevel-gear on its shaft, substantially as described.

2. In a carding-machine the combination of  
45 the following instrumentalities, the doffer-cylinder J, gear-wheel  $b$ , fast on the shaft of the doffer-cylinder, gear-wheel  $g$ , and gear-wheel  $n'$  fast on the hub of pulley  $d$ , pulley  
50  $d$ , pulley  $e$  fast on the railway-shaft  $a$ , worm-wheel  $v$ , fast on the shaft of the doffer-cylinder, lever  $n$ , bar  $t$ , to move lever  $n$ , bar  $s$  with V-shaped end, and rod N, with mechanism connecting said devices with the feed-rolls,  
55 said feed-rolls and means for operating them, substantially as described.

JOHN P. THOMPSON.

Witnesses:

BENJ. ARNOLD,

CHARLES T. HANNIGAN.