No. 631,022. Patented Aug. 15, 1899.

T. R. MARSDEN.

CARDING ENGINE.

(Application filed Mar. 15, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 12.

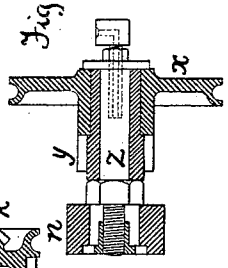


Fig. 11.

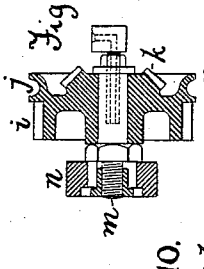


Fig. 2.

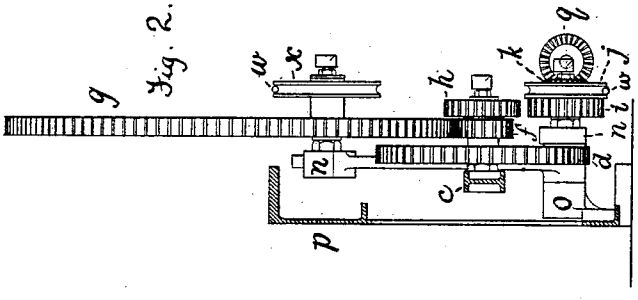


Fig. 10.

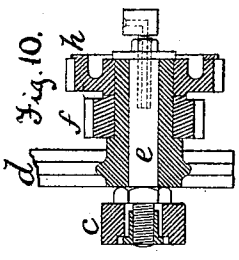


Fig. 1.

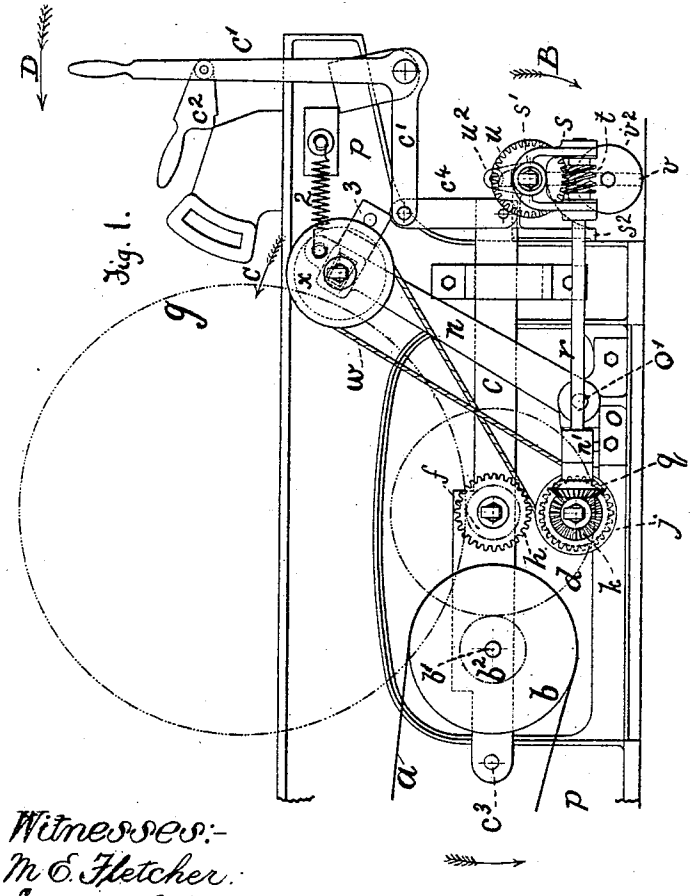
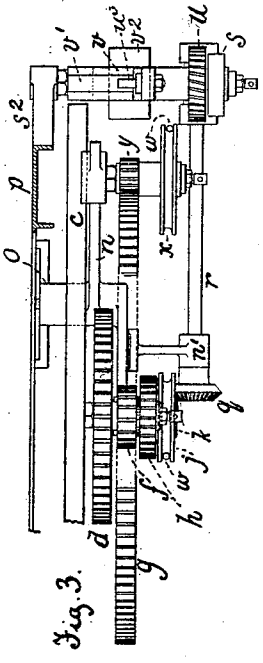


Fig. 3.



Witnesses:-
M. E. Fletcher.
Edward Vieser.

Inventor:-
Thomas R. Marsden
by attorneys
Brown & Seward

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

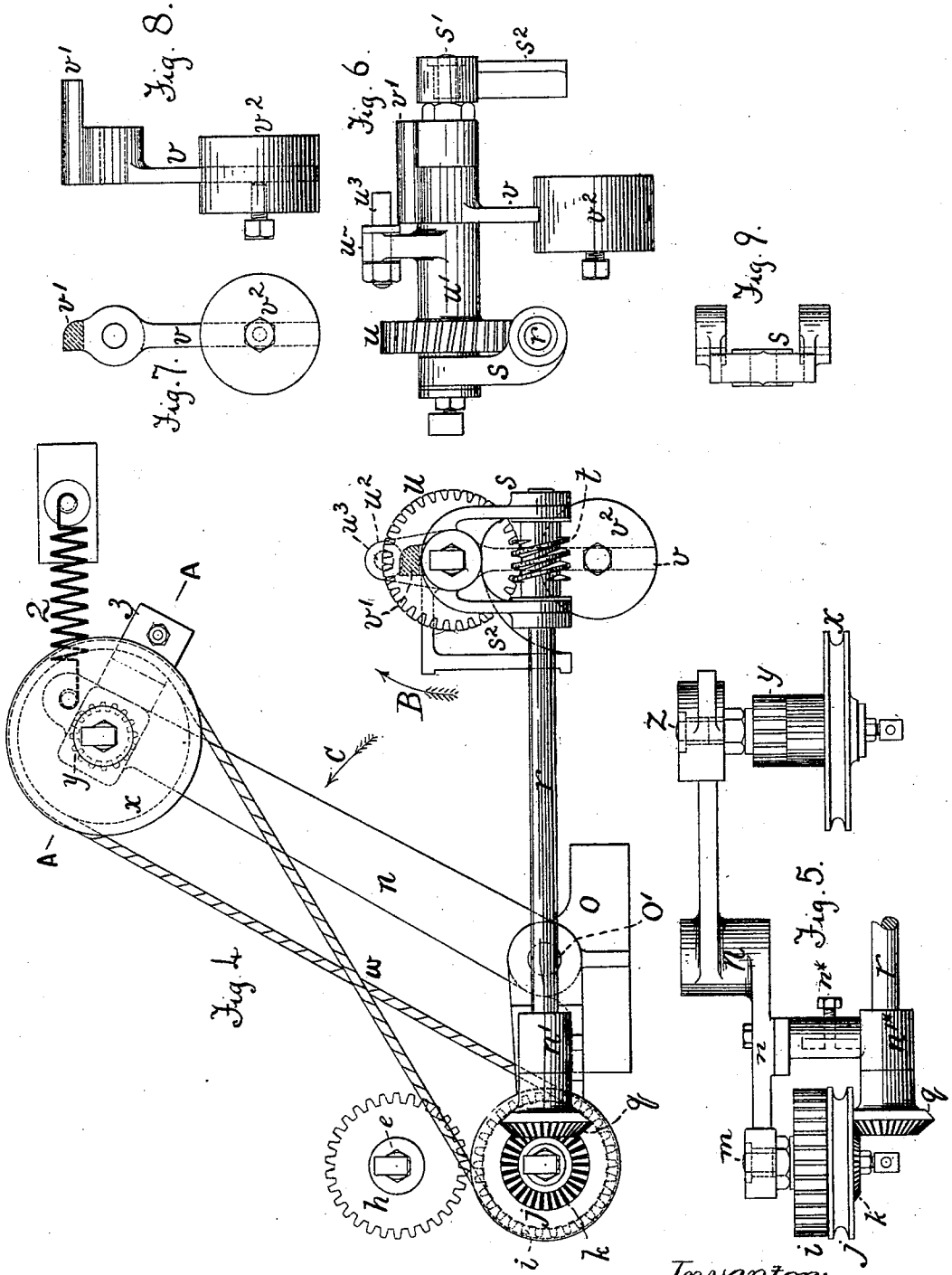
No. 631,022. Patented Aug. 15, 1899.

T. R. MARSDEN.

CARDING ENGINE.

(Application filed Mar. 15, 1898.)

(No Model.) 2 Sheets—Sheet 2.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS R. MARSDEN, OF OLDHAM, ENGLAND.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 631,022, dated August 15, 1899.

Application filed March 15, 1898. Serial No. 673,912. (No model.)

To all whom it may concern:

Be it known that I, THOMAS R. MARSDEN, manager, a subject of the Queen of the United Kingdom of Great Britain and Ireland, and a resident of Bank View, Derker, Oldham, in the county of Lancaster, England, have invented certain new and useful Improvements in Carding-Engines, of which the following is a specification.

This invention relates to carding-engines, and relates more particularly to the driving of the doffers of such machines.

In consequence of the high speed at which carding-engines are now worked the delivery of "web" or "sliver" by the doffer of a carding-engine now takes place at a speed so great that, except by an attendant of more than ordinary dexterity, the "piecing" or passing of the sliver into the bite of the calender-rollers of a carding-engine after the sliver has broken down is not effected quickly enough to avoid an accumulation of web or sliver beneath the doffing-comb, which is both objectionable and wasteful. To remove these and other objections, carding-engines have been provided with apparatus by means of which the attendant in charge of a carding-engine can reduce the speed of the doffer when piecing is to be effected and by that means reduce the speed at which the web or sliver is delivered by the doffer and so obtain more time for the piecing of broken slivers. It is the duty of attendants making use of such apparatus to set the doffers at work at full speed again immediately after piecing has been accomplished; but careless or negligent attendants often omit to do so, and the doffers are allowed to continue working at the slow speed, so that not only is the production of sliver reduced, but inferior work is done in consequence of some parts of the carding-engine being on their full speed while other parts are on the slow speed.

The object of my invention is the provision of arrangements of mechanism for the purpose of enabling the doffers of carding-engines to be made to revolve at less than their full working speed when the webs or slivers, having broken down, require to be "pieced" and preventing the doffers from being allowed to continue working at the slow speed by the mistake or neglect of the attendants in charge of such carding-engines after the piecing of the slivers has been accomplished or after such doffers have continued to revolve slowly for a sufficient length of time to allow of the piecing being done by ordinary attendants, thus insuring the prompt restoration of the doffers to their full speed.

In the accompanying drawings, in all the figures of which the same letters and numerals of reference are employed to indicate corresponding parts, Figure 1 is a side elevation of so much of a carding-engine with one form of my invention applied to it as is requisite for the illustration of my invention. Fig. 2 is an end elevation, partly in vertical section, of a portion of that which is shown in Fig. 1. Fig. 3 is a plan of a portion of that which is shown in Fig. 1, one of the wheels shown being only indicated in part, so that parts below it may be clearly shown. Fig. 4 is a side elevation upon a larger scale than Fig. 1, showing the parts which are employed in accordance with my invention in the arrangement illustrated by Figs. 1, 2, and 3. Fig. 5 is a plan of part of that which is shown in Fig. 4. Fig. 6 is an end elevation of a part of that which is shown in Fig. 4. Figs. 7 and 8 are respectively a side elevation at right angles to and a side elevation in the direction of the length of the carding-engine of a weighted lever shown but not capable of being fully illustrated in Figs. 1, 3, 4, and 6. Fig. 9 is a plan of a bracket shown but incapable of being fully illustrated in Figs. 1, 3, 4, and 6. Figs. 10 and 11 are vertical sections through some of the toothed wheels and pulleys employed in the arrangement illustrated and the parts on which they are supported, but with some parts shown in side elevation, so as to be clearer. Fig. 12 is a section, taken on the plane indicated by the line A A of Fig. 4, through a pulley employed in the arrangement illustrated in Fig. 1 and the parts by which it is supported, but showing external views of some parts and with a part shown slightly out of position, so as to be clearer.

The doffer of the carding-engine, of which part is illustrated in Fig. 1, is arranged to be driven by a belt *a*, arranged to receive motion from a pulley upon the axle of the taker-in roller of the carding-engine and impart motion to a pulley *b*, which is mounted upon a stud *b'*, secured in a drop-lever *c*, and is fur-

nished with a pinion b^2, fast upon it and gearing into a toothed wheel d. The wheel d is mounted upon a stud e, secured in the drop-lever c. To the boss of the wheel d are secured the wheels f and h. The wheel f gears into a toothed wheel g, fast upon the axle of the doffer. The drop-lever c is arranged to be capable of being turned about a stud c^3, secured in the side frame p of the carding-engine. When the drop-lever c is in its highest position, the wheel f will be in gear with the wheel g. When the drop-lever c is in its lowest position, the wheel h will be in gear with a wheel i. When the drop-lever c is in the middle position, the wheels f and h are both out of gear with the wheels they at times gear with and the doffer is allowed to remain in a state of rest. The hand-lever c' is connected to the drop-lever c by means of the link c^4. The catch c^2, which is mounted on the hand-lever c', determines the highest and middle positions of the drop-lever c. The engagement of the wheels h and i determines the lowest position of the drop-lever c. The weight of the parts mounted on the drop-lever c tends to move it downward and at the same time move the lever c' in the direction indicated by the arrow D. When the drop-lever c is moved to bring the pinion f out of gear with the toothed wheel g, the toothed wheel h is brought into gear with a toothed wheel i, formed with a pulley j and a bevel-wheel k and capable of being revolved upon a stud m, secured in the lower arm of a bell-crank lever n, capable of being oscillated upon a stud o', secured in a bracket o, mounted fast upon the side frame p of the carding-engine. The upper end of the bell-crank lever n is provided with a stud, upon which is mounted a pinion y, formed with a sleeve fast upon which is mounted a pulley x. Around the pulley x and the pulley j is passed a band w, which in Figs. 2 and 3 is only indicated in part in order that other parts may be better shown. The pinion y is so placed that it may be brought into gear with the toothed wheel g by the bell-crank lever n being oscillated in the direction indicated by the arrow C. When the drop-lever c is lowered to bring the pinion f out of gear with the toothed wheel g and the toothed wheel h is brought into gear with the toothed wheel i, the drop-lever c and the parts carried by and connected to it bear upon the toothed wheel i and the lower arm of the bell-crank lever n, and so cause the bell-crank lever n to oscillate in the direction indicated by the arrow C, so that the pinion y is brought into gear with the toothed wheel g. The pulley j being smaller than the pulley x and the wheel y being smaller than the wheel f, the bringing of the pinion y into gear with the toothed wheel g will cause the doffer of the carding-engine to revolve at the requisite slow speed.

A spring 2 is connected at one end to a stud secured in the bell-crank lever n and at the other end to a stud in a bracket upon the side frame p. The spring 2 and the weight of the pulley x and wheel y and the upper arm of the bell-crank lever n always tend to move the wheel y out of gear with the toothed wheel g as soon as the drop-lever c is raised.

The movement of the bell-crank lever n in the direction opposite to that indicated by the arrow C is limited by means of a bracket 3, secured upon the side frame p.

The bevel-wheel k, formed with the wheel i, is made to gear into a bevel-wheel q, mounted fast upon a shaft r, which at one end is capable of being revolved and slightly oscillated in a bracket n', secured to the bell-crank lever n, and at the other end is capable of being revolved in bearings provided in a yoke s, capable of being oscillated upon a stud s', secured in a bracket s^2, mounted fast upon the side frame p. The bracket n' n'^* is in two parts, as shown in Fig. 5, one, n'^*, formed with a shank or spindle (shown in dotted outline in Fig. 5) capable of turning in the other, n', which is provided with a screw n^*, entering a groove formed around the said shank and serving to retain the said part n'^* in position while permitting its oscillation. A worm t is mounted fast upon the shaft r. The worm t is made to gear into a worm-wheel u, capable of being revolved upon the stud s'. The worm-wheel u is provided with a sleeve u', upon which is formed an arm u^2, in which is secured a projecting stud u^3, which if the worm-wheel u be revolved will come into contact with and turn a weighted tumbler-lever v, which is capable of being revolved upon the stud s' and is furnished with a projecting finger v', which at times is capable of lifting the drop-lever c from its lowest to its highest position. The tumbler-lever and the sleeve u' are kept in place lengthwise of the stud s' by a collar v^*, (see Fig. 6,) which is placed on the said stud and secured by a nut thereon. When the drop-lever c is in its lowest position and the tumbler-lever v has been turned by the revolution of the worm-wheel u around the stud s' in the direction indicated by the arrow B until the weight v^2 upon the tumbler-lever v arrives above and is carried over the stud s' and tumbles over, the tumbler-lever v causes the projecting finger v' to raise the drop-lever c and bring the wheel f into gear with the wheel g and allows the catch c^2 to drop into position to hold the wheel f in gear with the wheel g. When the drop-lever c is released to disengage the wheel f from the wheel g and engage the toothed wheel h with the wheel i and the pinion y with the toothed wheel g for the purpose of driving the doffer at a slow speed, the toothed wheels h i, bevel-wheels k q, shaft r, worm t, worm-wheel u, arm u^2, projecting stud u^3, and weighted tumbler-lever v will after a certain time, depending upon the speed at which the worm-wheel u is caused to revolve, raise the drop-lever c, so as to reëngage the wheel f with the wheel g, when the doffer will again revolve at full speed. The period for which the slow revolution of the doffer is allowed to continue may obvi-

ously be limited to any required extent by the gearing employed being arranged to turn the projecting finger w^3 at a suitable speed.

When it is necessary to piece up the sliver or web from the doffer to the calenders, the attendant lifts the catch c^2, which permits the drop-lever c to change the driving of the doffer from the full speed to the slow speed to enable the attendant to piece the end. While this is being done, the tumbler-lever v is being brought into position to lift the drop-lever c. The lifting of the drop-lever c by the tumbler-lever v will change the driving of the doffer from slow speed to full speed. When the doffer is running at the full speed, the slow-motion parts are at rest.

What I claim, and desire to secure by Letters Patent, is—

1. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing, a lever capable of being oscillated, a train of gearing carried by such lever to receive motion from the mechanism carried by the drop-lever when the drop-lever is moved into one position and transmit motion to the doffer, a train of gearing to receive motion from the means by which the said mechanism carried by the drop-lever may impart motion to a train of gearing and furnished with a projecting finger to act upon the drop-lever, all arranged, employed and operating for the purpose of enabling the doffer to revolve at a slow speed when sliver or web requires to be pieced and insuring the prompt restoration of the doffer to its full speed after it has been caused to revolve at a slow speed for a time.

2. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing, a lever capable of being oscillated, a train of gearing carried by such lever to receive motion from the mechanism carried by the drop-lever when the drop-lever is moved into one position and transmit motion to the doffer, a second train of gearing receiving motion by the said means whereby the mechanism carried by the said drop-lever may impart motion to trains of gearing and comprising bevel-wheels, a shaft, a worm upon such shaft and a worm-wheel in gear with such worm, a projecting stud connected to the said worm-wheel, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and furnished with a projecting finger having within its path of revolution a part of the said drop-lever, all arranged, employed and operating for the purpose of enabling the doffer to revolve at a slow speed when the web or sliver requires to be pieced and insuring the prompt restoration of the doffer to its full speed after it has been caused to revolve at a slow speed for a time.

3. In a carding-engine the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing, a lever capable of being oscillated, a pulley at one end of the said lever and provided with means to receive motion from the mechanism carried by the said drop-lever when such drop-lever is in one position, a pulley at the other end of the said lever, a band to transmit motion from one pulley to the other, a pinion fast with the second pulley and adapted to gear into the toothed wheel upon the axle of the doffer when the drop-lever is in the said position, bevel-wheels one fast with the pulley provided with means to receive motion from the mechanism carried by the drop-lever and the other gearing into it, a shaft to carry the second bevel-wheel, a worm on such shaft, a worm-wheel in gear with the said worm, a projecting stud connected to the said worm-wheel, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and furnished with a projecting finger having within its path of revolution a part of the said drop-lever, all arranged, employed and operating for the purpose of enabling the doffer to revolve at a slow speed when the web or sliver requires to be pieced and insuring the prompt restoration of the doffer to its full speed after it has been caused to revolve at a slow speed for a time.

4. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of a toothed wheel mounted upon the said drop-lever, a lever capable of being oscillated, a toothed wheel carried by one end of the said lever and fast with a pulley and a bevel-wheel and arranged to receive motion from the toothed wheel mounted upon the drop-lever when the said drop-lever is in one position, a pulley at the other end of the said lever, a band to transmit motion from one pulley to the other, a pinion fast with the second pulley and adapted to gear into the toothed wheel upon the axle of the doffer when the drop-lever is in the said position a bevel-wheel gearing into that fast with the pulley, a shaft to carry the second bevel-wheel, a worm on such shaft, a worm-wheel in gear with the said worm, a projecting stud connected to the said worm-wheel, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and furnished with a projecting finger having within its path of revolution a part of the said drop-lever, all arranged, employed and operating for the purpose of enabling the

doffer to revolve at a slow speed when the web or sliver requires to be pieced and insuring the prompt restoration of the doffer to its full speed after it has been caused to revolve at a slow speed for a time.

5. In a carding-engine, the combination with means for driving the doffer at its normal speed and mechanism by means of which the doffer may be made to revolve slowly when the sliver or web requires to be pieced, of a train of gearing brought into action along with the means by which the doffer is caused to revolve at a slow speed and furnished with a revolving part having a finger to act upon the mechanism by means of which the driving of the doffer is controlled and insure the prompt restoration of the doffer to its full speed after it has been caused to revolve at a slow speed for a time.

6. In a carding-engine, the combination with mechanism by which the driving of the doffer is controlled, mechanism for driving the doffer at its normal speed and mechanism by means of which the doffer may be made to revolve slowly when the sliver or web requires to be pieced, of a weighted lever and a support whereon it may be revolved, a projecting finger upon such weighted lever and having within its path of revolution a part of the mechanism by which the driving of the doffer is controlled, a train of gearing comprising a revolving part with a projecting stud to act upon and turn the said weighted lever, and means whereby the mechanism by which the driving of the doffer is controlled may impart motion to such train of gearing while the doffer is driven at a slow speed, for the purposes set forth.

7. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer and mechanism by means of which the doffer may be made to revolve at a slow speed when the sliver or web having broken may require to be pieced, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing while the doffer is driven at a slow speed a train of gearing to receive motion from the said mechanism carried by the drop-lever, a projecting finger upon part of such train of gearing and having a part of the said drop-lever within its path of revolution for the purposes set forth.

8. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer and mechanism by means of which the doffer may be made to revolve at a slow speed when the sliver or web requires to be pieced, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing, a train of gearing to receive motion while the doffer is driven at a slow speed by the said means, a revolving part forming part of such train of gearing and furnished with a projecting stud, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and furnished with a projecting finger having within its path of revolution a part of the said drop-lever for the purposes set forth.

9. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer and mechanism by means of which the doffer may be made to revolve at a slow speed when the sliver or web requires to be pieced, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing while the doffer is driven at a slow speed, a train of gearing to receive motion by the said means, a worm-wheel forming part of such train of gearing and furnished with a projecting stud, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and furnished with a projecting finger having within its path of revolution a part of the said drop-lever, for the purposes set forth.

10. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer and mechanism by means of which the doffer may be made to revolve at a slow speed when the sliver or web requires to be pieced, of means by which the mechanism carried by the said drop-lever may impart motion while the doffer is driven at a slow speed to a train of gearing, a train of gearing to receive motion by the said means and comprising bevel-wheels, a shaft, a worm upon such shaft and a worm-wheel in gear with such worm, a projecting stud connected to the said worm-wheel, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and furnished with a projecting finger having within its path of revolution a part of the said drop-lever, for the purposes set forth.

11. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer and mechanism by means of which the doffer may be made to revolve at a slow speed when the sliver or web requires to be pieced, of a toothed wheel mounted upon the said drop-lever, a toothed wheel fast with a bevel-wheel and arranged to receive motion from the toothed wheel mounted upon the drop-lever when the said drop-lever is in one position, a bevel-wheel to receive motion from the said bevel-wheel and a shaft to carry it, a worm fast upon the said shaft, a worm-wheel in gear with the said worm, a projecting stud connected to the said worm-wheel, a weighted lever capable of revolution and arranged to be acted upon by the said projecting stud and

furnished with a projecting finger having within its path of revolution a part of the said drop-lever, for the purposes set forth.

12. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of means by which the mechanism carried by the drop-lever may impart motion to a train of gearing, a lever capable of being oscillated, a train of gearing carried by such lever to receive motion from the mechanism carried by the drop-lever when the drop-lever is moved into one position and transmit motion to the doffer, all arranged, employed and operating for the purpose of enabling the doffer to revolve at a slow speed when the web or sliver requires to be pieced.

13. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of means by which the mechanism carried by the said drop-lever may impart motion to a train of gearing, a lever capable of being oscillated, a pulley at one end of the said lever and provided with means to receive motion from the mechanism carried by the said drop-lever when such drop-lever is in one position, a pulley at the other end of the said lever, a band to transmit motion from one pulley to the other, a pinion fast with the second pulley and adapted to gear into the toothed wheel upon the axle of the doffer when the drop-lever is in the said position, all arranged, employed and operating for the purpose of enabling the doffer to revolve at a slow speed when the web or sliver requires to be pieced.

14. In a carding-engine, the combination with means for driving the doffer at its normal speed and a drop-lever carrying part of the mechanism by which motion is transmitted to the doffer, of a toothed wheel mounted upon the said drop-lever, a lever capable of being oscillated, a toothed wheel carried by one end of the said lever and fast with a pulley and arranged to receive motion from the toothed wheel mounted upon the drop-lever when the said drop-lever is in one position, a pulley at the other end of the said lever, a band to transmit motion from one pulley to the other, a pinion fast with the second pulley and adapted to gear into the toothed wheel upon the axle of the doffer when the drop-lever is in the said position, all arranged, employed and operating for the purpose of enabling the doffer to revolve at a slow speed when the web or sliver requires to be pieced.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 5th day of March, 1898.

THOMAS R. MARSDEN.

Witnesses:
HOWARD CHEETHAM,
JAMES BOAM MILNER.