J. B. HOWE.

CLUTCH FOR FEEDING MECHANISM FOR CARDING MACHINES.

APPLICATION FILED FEB. 27, 1911.

998,003. **Patented July 18, 1911.**

2 SHEETS—SHEET 1.

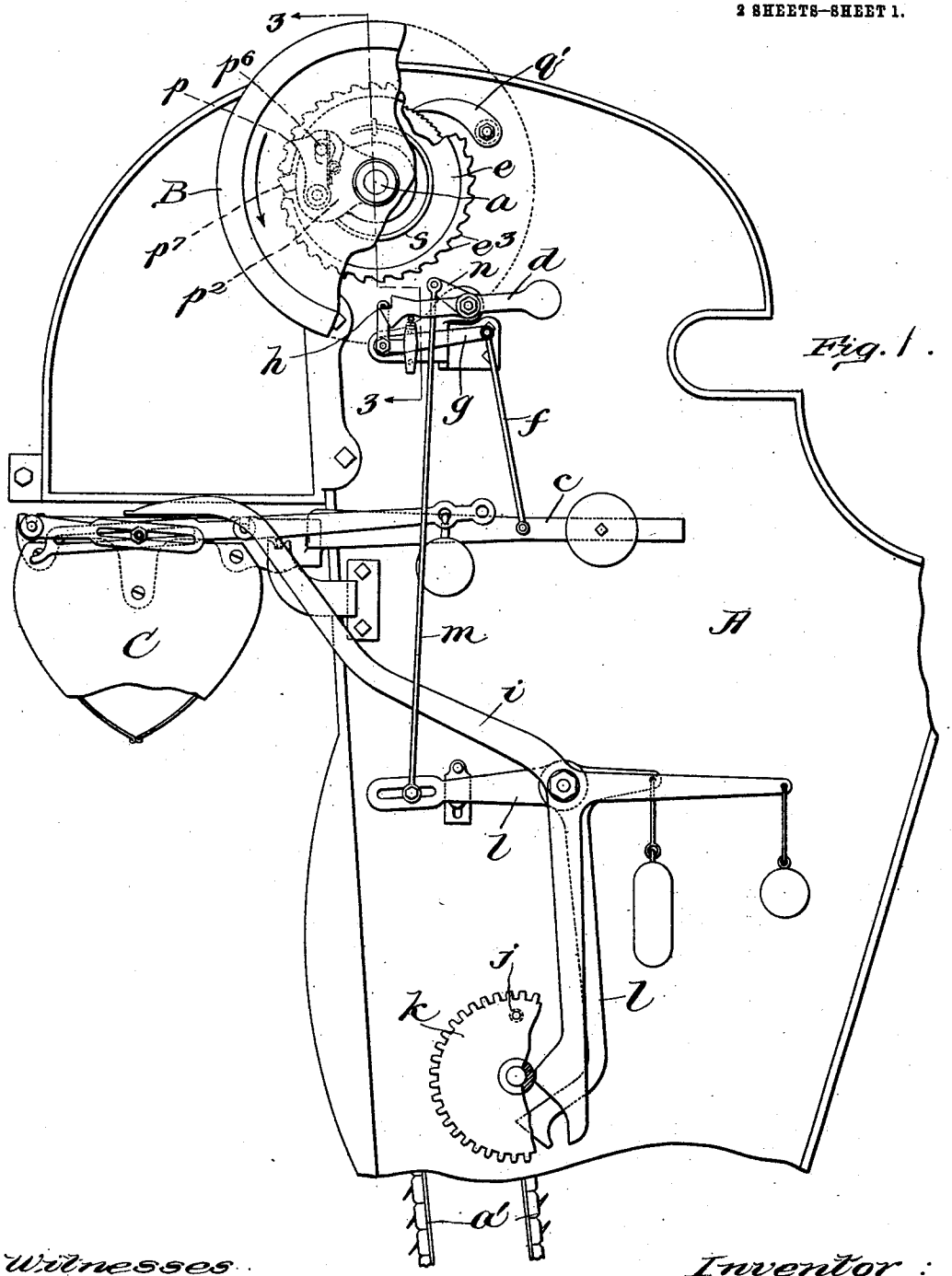

Fig. 1.

Witnesses.
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2 SHEETS—SHEET 2.

Fig. 2.

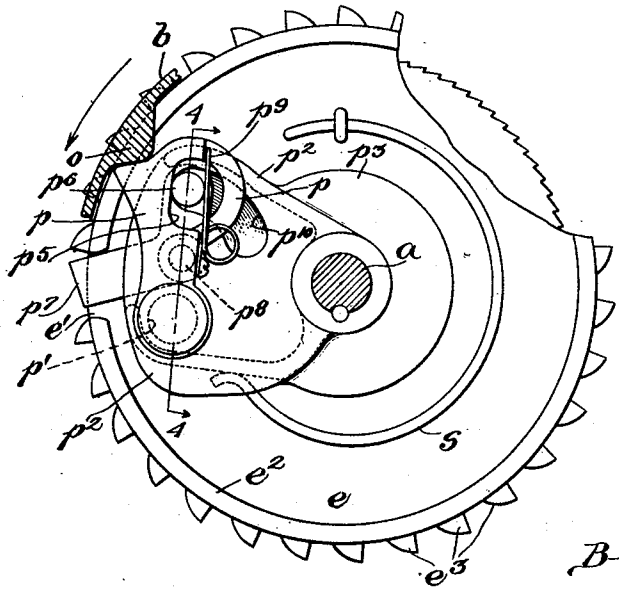
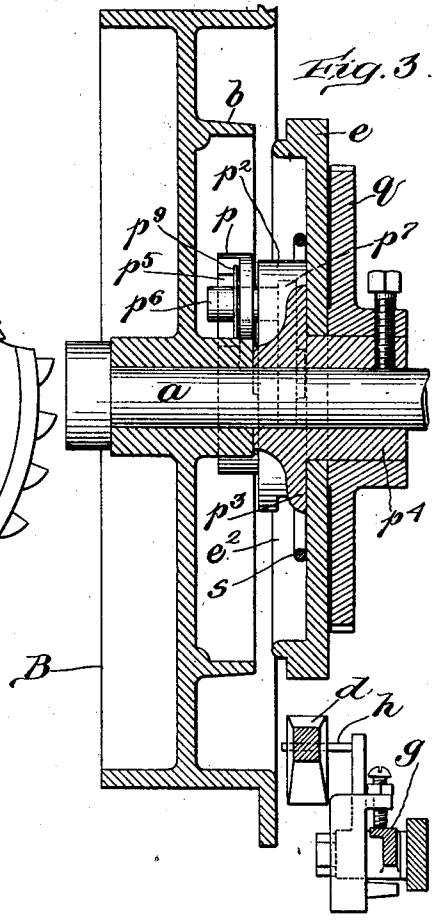


Fig. 3.



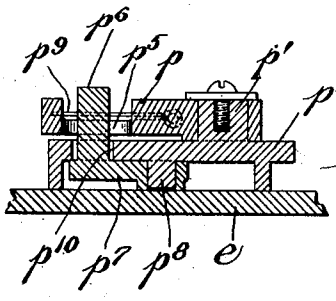


Fig. 4.

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CLUTCH FOR FEEDING MECHANISM FOR CARDING-MACHINES.

998,003. Specification of Letters Patent. **Patented July 18, 1911.**

Application filed February 27, 1911. Serial No. 611,052.

To all whom it may concern:

Be it known that I, JOSEPH B. HOWE, a citizen of the United States, and resident of Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Clutches for Feeding Mechanism for Carding-Machines, of which the following is a specification.

The invention relates to feeding mechanisms for carding machines, pickers, washers, etc., and particularly to feeding mechanisms of the general character illustrated in Letters Patent of the United States to W. C. Bramwell No. 216,373, dated June 10, 1879. Feeding mechanisms of this sort are well known to those familiar with the art, and as my invention has to do principally with the clutch and its associated parts for connecting the driving pulley with the shaft which actuates the lifting apron, it will be necessary to describe only such parts of the machine as are intimately associated with the clutch.

In the accompanying drawings which illustrate one embodiment of the invention,—Figure 1 is a side view, partly broken away, of a feeding mechanism containing the invention; Fig. 2 is an enlarged, side view of the clutch, certain parts being shown in section, and certain parts being broken away; Fig. 3 is an enlarged sectional view on line 3—3 of Fig. 1; and Fig. 4 is a sectional view on line 4—4 of Fig. 2.

A represents the casing of the feeding mechanism, *a* the shaft for actuating the lifting apron *a'*, or "spike apron" as it is usually called, B the driving pulley loose on shaft *a* and C the scale, all of usual and well known construction. The lever or latch *d* for engaging and arresting the clutch controlling wheel *e* and the mechanism for automatically operating said lever *d* are also of the usual construction.

It will be understood that when a predetermined weight of wool or other material has been deposited from the lifting apron *a'* into the scale C, the scale will tip, thereby swinging the scale arm *c* upward, pushing the link *f* and lever *g* also upward, and swinging the catch *h* to the left as viewed in Fig. 1. This releases the latch *d*, the right hand end of which is weighted, causing the left hand end to swing upward and engage one of the teeth of wheel *e*. The arresting of the wheel *e* disengages a clutch connecting the driving pulley B with the driven shaft *a*, permitting the pulley B to run idly on the shaft *a*, and stopping the delivery of material from the spike apron into the scale. The wings of scale C are then opened in the usual way by lever *i*, which is actuated by a pin *j* on gear wheel *k*. After the load is dumped the scale C returns to its original position and the continued rotation of gear wheel *k* and pin *j* swings the resetting lever *l*, which is in the form of a bell-crank, thereby pulling down link *m* which, in turn, pulls down crank *n* fast to lever or latch *d* thus swinging the latch *d* out of engagement with the wheel *e*, releasing the same and allowing the clutch again to engage shaft *a* and start the spike apron *a'*. As heretofore constructed, the clutch which is thus automatically operated consisted of a stud or pin on the inner face of pulley B, which stud was engaged by a shiftable stud or pin carried by a segmental-shaped plate secured fast to shaft *a*, the shiftable pin being moved out of engagement with the stud on pulley B when the wheel *e* was arrested. This was accomplished by the relative movement between wheel *e* and the segmental plate referred to. The action of wheel *e* however caused the shiftable stud to move only far enough to disengage from the other stud on pulley B without removing it far enough from the path of such stud to prevent the studs from striking each time they passed one another during the continuous revolution of pulley B. This resulted in the wearing of the studs and the subjecting of the machine to a shock each time the studs struck one another in passing.

One object of my invention is to overcome this defect and provide mechanism which will cause the shiftable clutch member, after being disengaged from the other clutch

member by the positive action of the clutch shifting wheel *e*, to continue its movement independently of the action of wheel *e* and withdraw completely from the path of the clutch member on pulley B which moves in a fixed path. In machines as heretofore constructed there has also been mechanism for holding the spike apron and shaft *a* from turning backward when the clutch is disengaged. This is rendered necessary for the reason that the weight of material on the upwardly traveling stretch of the spike apron tends to pull the apron downward and reverse the shaft *a* unless provision is made to counteract such tendency. The backward turning of shaft *a* would also by reversing the relative movement of the shaft *a* and wheel *e*, restore the shifting clutch member to the path of the clutch member on pulley B, thereby reëngaging the clutches notwithstanding that the wheel *e* is held stationary. This tendency of the shaft *a* and spike apron *a'* to reverse, has heretofore been prevented with moderate success by a friction wheel fast to shaft *a* and a friction strap extending nearly around the friction wheel and secured at its ends to pulley B. The strap was so adjusted that when the shaft *a* stopped, as above described, pulley B still running free and carrying the friction strap, the latter acted as a brake on the friction wheel, which had also stopped being fast on shaft *a*, and prevented the shaft *a* from reversing. The strap however did not engage the friction wheel tightly enough to act as a clutch to turn the shaft forward with the pulley B in its normal direction. Such a device was obviously uncertain in operation and wasteful of power, since it acted as a brake as well against the forward movement of pulley B when running idly, as against the backward movement of shaft *a*.

It is a further object of my invention to provide an improved and positive device for preventing the backward movement of the shaft *a* and spike apron *a'* when the clutch is disengaged. Referring again to the drawings, *o* represents a lug or projection extending inwardly from the annular flange *b* on the driving pulley B and constitutes the driving member of two clutch members. It will be seen that the driving member *o* moves in a fixed circular path about the axis of shaft *a*. The driven member, as herein shown, is the shiftable member and consists of the dog *p* the end or nose of which is adapted to engage the other clutch member *o*. The dog *p* is pivoted on a stud p' fast to the outer side of a segment-like crank piece p^2 which is keyed to shaft *a*. The crank piece p^2 is provided with a hub or sleeve p^4 and a flange p^3, and fast to the hub p^4 is a ratchet wheel *q*, the purpose of which will presently be described. Between the flange p^3 and the ratchet wheel *q* is the clutch operating wheel *e* which is loose on hub p^4. The dog *p* is made with the aperture p^5, through which projects a stud p^6 on the end of one arm of a bell crank lever p^7. The aperture p^5 is made sufficiently large to provide a substantial clearance within which the stud p^6 can play. The lever p^7 is pivoted to the under side of the crank piece p^2 on a stud p^8, and the end of said lever opposite to said stud p^6 extends through a slot or aperture e' in the annular flange e^2 on wheel *e*. A spring p^9 fastened to the dog *p* and pressing against stud p^6 tends normally to urge the dog *p* inward on its pivot p'. The crank piece p^2 is made with a curvel slot p^{10} describing an arc about the stud p^8 as a center, and the stud p^6 projects upward through the slot p^{10}. A spring *s* fastened to wheel *e* and pressing against the side of crank piece p^2 normally urges the wheel *e* in the direction of rotation of the parts represented by the arrow in Figs. 1 and 2; that is, in the direction to set the shiftable clutch member in operative position.

The operation of the device is as follows: When the driving pulley B is revolved in the direction of the arrow by the usual driving belt, with the parts in normal position, as best shown in Fig. 2, and the driving clutch member *o* in engagement with the driven clutch member *p*, the driven shaft *a* will also be turned by the crank piece p^2 on which the dog or driven clutch member *p* is mounted, and the spike apron which is actuated by the shaft *a* will carry up the material and deliver it to the scale C. When the scale C has received its predetermined weight of material it will tilt and swing the latch or lever *d* upward as already described to engage one of the teeth e^3 of the clutch controlling wheel *e*, which, it will be remembered, is loose on hub p^4 and will turn thereon relatively to the crank piece p^2 on shaft *a*. The wheel *e* is arrested by the latch *d* and the continued movement of the pulley B will first cause the bell crank lever p^7, one end of which is held in slot e' of the now stationary wheel *e*, to swing on its pivot thereby swinging the stud p^6 inwardly in slots p^5 and p^{10}, thus compressing and storing up energy in spring p^9, until stud p^6 engages the opposite side of aperture p^5 in the dog *p*. Thereupon, continued movement of the lever p^7 will positively swing the dog *p* inward on its pivot p' until the end or nose of the dog disengages from the lug *o*, thus disconnecting the pulley B from the shaft *a*, and permitting the pulley B to turn idly on said shaft. This stops the elevation and delivery of material by the spike apron to the scale. The instant the

dog p disengages from lug o, the spring p^9 is free to act and snaps the dog p still farther inward and wholly away from the path of lug o, so that when lug o again comes around in its fixed path it will pass wholly clear of the other clutch member p instead of striking it in passing.

The relative movement between the wheel e and the crank piece p^2 consequent upon the arresting of wheel e will have pressed back the spring s, which normally tends to throw the clutch member p again into operative position, and which, were there no preventative means, would assist the weighted spike apron to turn the shaft a backward. Therefore, in order to prevent the shaft a from turning backward, and to hold the clutch members in disengaged position until they are reset by the withdrawal of latch d from the wheel e, as already described, a fine toothed ratchet wheel q is provided fast to hub p^4 and shaft a. Pivoted to the casing A is a drag pawl q' which engages the teeth of ratchet wheel q and holds the shaft a against movement in reverse direction thereby holding the clutch members also in disengaged position. When the latch d is again withdrawn by the resetting devices already described wheel e is released and permitted to turn on hub p^4 under the influence of spring s in the direction of the arrow, and in so doing resets the shiftable clutch member or dog p to the position shown in Fig. 2, the slot e' acting on lever p^7 to throw stud p^6 outward, and the stud p^6 carrying with it the dog p, which is again moved into the path of lug o, whereupon the spike apron will resume its work.

I claim:

1. A clutch, mechanism to engage and disengage said clutch, said clutch comprising a driving member and a driven member, one member moving in a fixed circular path and the other member being shiftable into and out of said fixed path, and means adapted after said members are disengaged, to move said shiftable member away from said fixed path.

2. A clutch, mechanism to engage and disengage said clutch, said clutch comprising a driving member and a driven member, one member moving in a fixed circular path and the other member being shiftable into and out of said fixed path, and a spring adapted to move said shiftable member away from said fixed path after said members are disengaged.

3. A clutch, mechanism to engage and disengage said clutch, said clutch comprising a driving member and a driven member, one member moving in a fixed circular path and the other member being shiftable into and out of said fixed path, and a spring adapted to move said shiftable member away from said fixed path after said members are disengaged, the mechanism for disengaging said clutch being adapted successively to store up energy in said spring, then to withdraw said shiftable member from engagement with the other member, and then to permit said spring to move said shiftable member away from the fixed path of the other member.

4. A driving pulley and a driven shaft, a clutch therebetween, mechanism to engage and disengage said clutch, said clutch comprising a driving member fast to said pulley and moving in a fixed circular path, and a driven member shiftable into and out of said fixed path, a crank piece fast to said driven shaft on which said shiftable clutch member is mounted, and means adapted to move said shiftable member away from the fixed path of the other member after said members have been disengaged.

5. A driving pulley and a driven shaft, a clutch therebetween, said clutch comprising a driving member fast to said pulley and moving in a fixed circular path, and a driven member shiftable into and out of said fixed path, a crank piece fast to said driven shaft on which said shiftable clutch member is mounted, a clutch shifting wheel loose on said driven shaft, a lever pivoted to said crank piece and actuated by said clutch shifting wheel, adapted to move said shiftable clutch member into and out of the path of the other member, and means to move said shiftable clutch member away from said fixed path independently of said lever after said members are disengaged.

6. A driving pulley and a driven shaft, a clutch therebetween, said clutch comprising a driving member fast to said pulley and moving in a fixed circular path, and a driven member shiftable into and out of said fixed path, a crank piece fast to said driven shaft on which said shiftable member is mounted, a clutch shifting wheel loose on said driven shaft, a lever pivoted to said crank piece and actuated by said clutch shifting wheel, a stud carried by said lever and projecting into an aperture provided therefor in said shiftable clutch member, said stud adapted to move said shiftable member in either direction, and said aperture being enough larger than the stud to afford a clearance for the movement of the stud therein, and a spring tending normally to urge the shiftable member toward the stud and away from the path of the other member.

7. A flanged pulley, a shaft, and a clutch therebetween, said clutch comprising a projection extending inwardly from the flange of said pulley and moving in a fixed circular path, and a shiftable member carried by said shaft within the plane of said fixed path,

and movable outward into said fixed path and inward away from said fixed path, and means adapted after said clutch is disengaged by the inward movement of the shiftable member to move said shiftable member still farther inward away from said fixed path.

Signed by me at Boston, Massachusetts, this 21st day of February 1911.

JOSEPH B. HOWE.

Witnesses:
CHARLES D. WOODBERRY,
JOSEPHINE H. RYAN.