(No Model.) 2 Sheets—Sheet 1.

F. J. HENRICHSEN.

CLUTCH.

No. 363,635. Patented May 24, 1887.

Fig. 1.

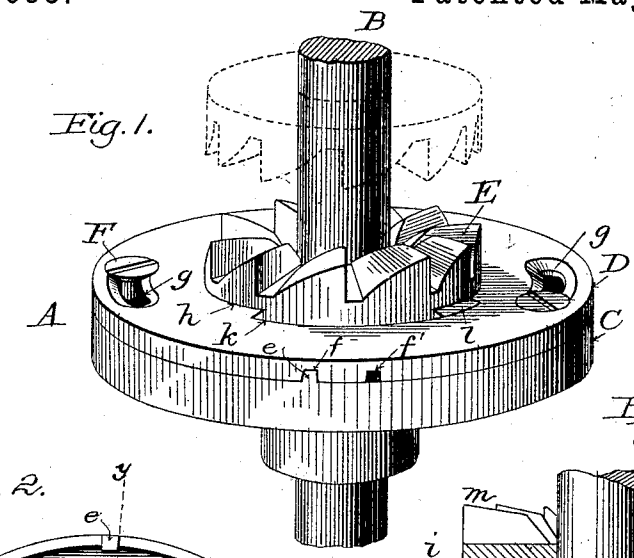


Fig. 2.

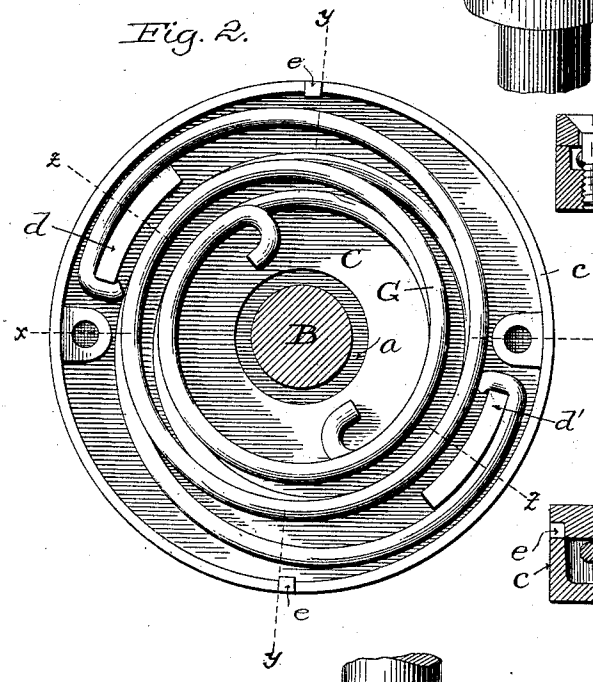


Fig. 3.
ON x-x.

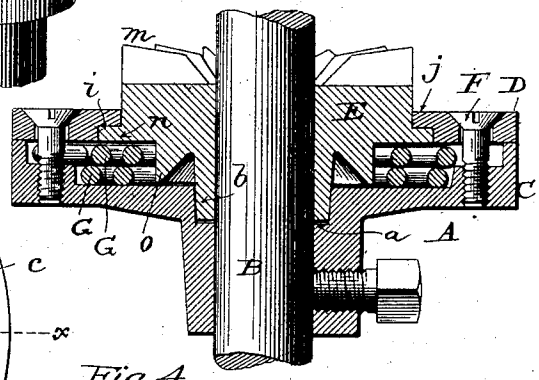


Fig. 4.
ON y-y.

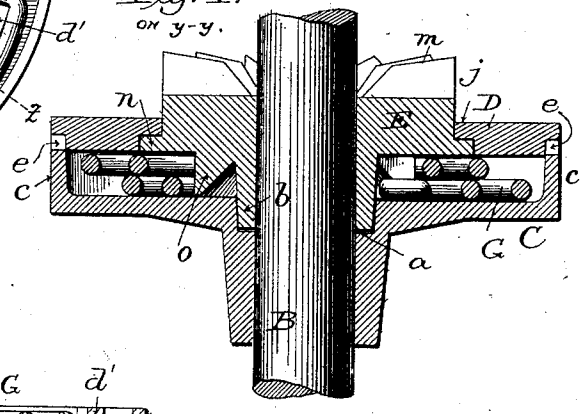
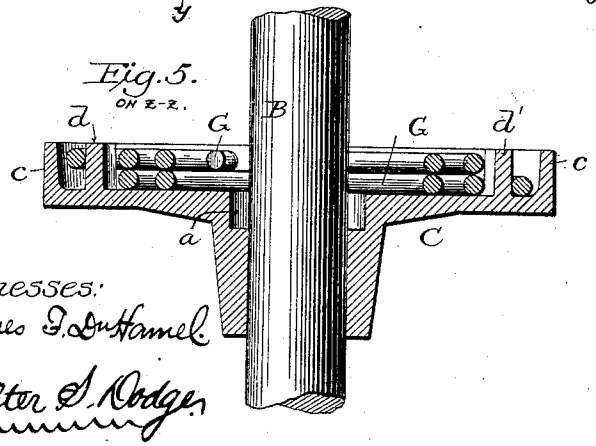


Fig. 5.
ON z-z.



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(No Model.)

2 Sheets—Sheet 2.

F. J. HENRICHSEN.

CLUTCH.

No. 363,635.

Patented May 24, 1887.

Fig. 6.

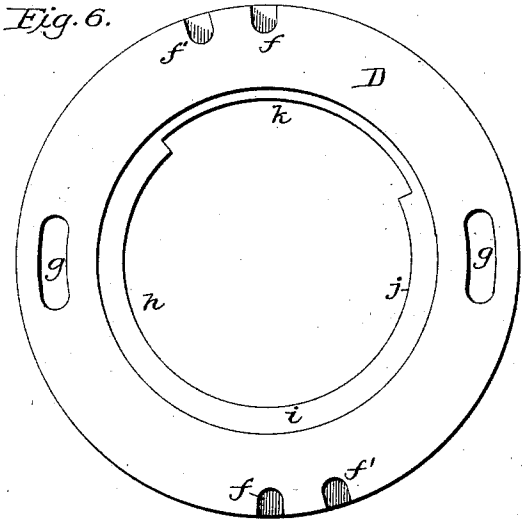


Fig. 7.

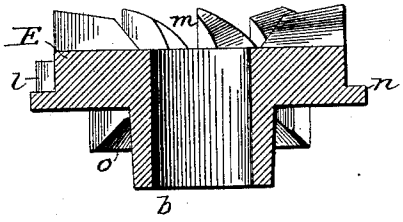
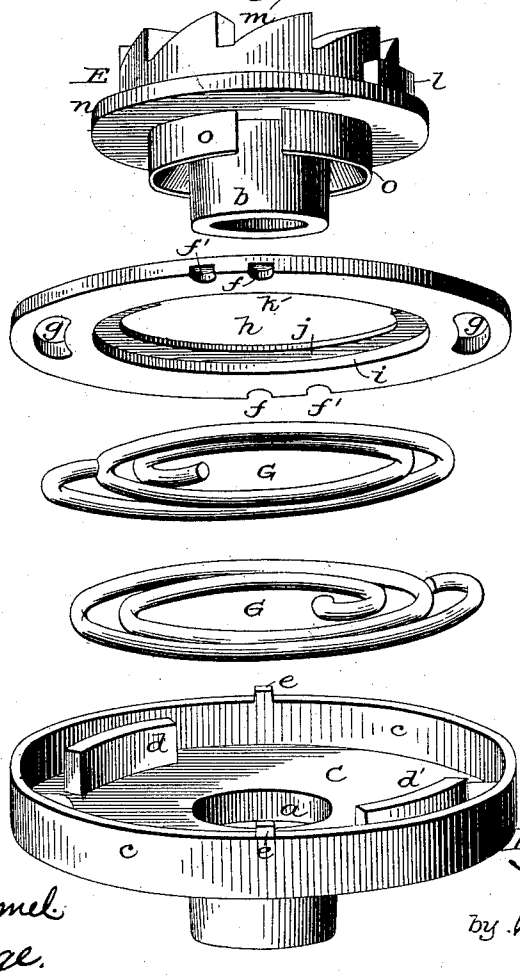


Fig. 8.



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UNITED STATES PATENT OFFICE.

FREDERICK JULIUS HENRICHSEN, OF RACINE, WISCONSIN.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 363,635, dated May 24, 1887.

Application filed January 17, 1887. Serial No. 224,661. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK JULIUS HENRICHSEN, of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Clutches, of which the following is a specification.

My invention relates to clutches; and it consists in various features and details hereinafter fully set forth and claimed, the primary object of the invention being to overcome the jar or concussion due to sudden engagement of the teeth of the two parts.

In the drawings, Figure 1 is a perspective view of my improved clutch, showing only one of the clutch-hubs; Fig. 2, a plan view with the cap-plate and clutch-hub removed; Fig. 3, a section on the line *x x*, showing the cap-plate and clutch hub in position; Fig. 4, a similar view on the line *y y;* Fig. 5, a view on the line *z z*, with the hub and cap removed; Fig. 6, a bottom plan view of the cap-plate; Fig. 7, a vertical central sectional view of the clutch-hub, and Fig. 8 a view of the parts separated.

A indicates the clutch as a whole mounted upon and rigidly secured to a shaft, B, the device comprising a case or shell, C, a cap-plate, D, and a clutching-hub, E, the cap-plate being secured to the case or shell and serving to confine the clutching-hub to its seat.

The casing or shell C, as shown in Figs. 2, 3, 4, and 5, is provided with a central socket or depression, *a*, circular in cross-section, to receive a depending hub or flange, *b*, formed upon the under face of the clutching-hub E, the socket forming a bearing for the hub E in its movements. The shell or casing C is further provided with a laterally-extending circumferential wall or flange, *c*, with lugs *d d'* in the bottom on opposite sides diametrically from each other, and, finally, with studs *e e*, also arranged diametrically opposite each other upon the face or edge of the wall or flange *c*, as clearly shown in Fig. 2.

The cap-plate D is merely a flat plate provided with two sets of sockets, *f f'*, on its under side at its edge, which are adapted to fit upon or to receive the studs *e e*, as shown in Figs. 1 and 4, the sockets *f f* and *f' f'* being arranged diametrically opposite each other, as shown in Fig. 6. Cap-plate D is further provided near its outer edge with two curved slots, *g g*, concentric with the axis of shaft B, as shown in Figs. 1 and 6, with a central opening, *h*, and with a seat or depression, *i*, upon or in its under face around the opening *h*. This construction forms a flange, *j*, which, as shown in Figs. 1 and 6, is cut away for about a quarter of its circumference, as at *k*, to receive a lug, *l*, formed upon the clutching-hub E.

Screws F pass through the slots *g* into the shell or case C, and thereby retain the cap in place upon the latter, though permitting one to be moved upon or in relation to the other without entirely removing the screws.

The clutching-hub E fits loosely upon the shaft B and is provided upon its upper face with teeth *m*, and at the base of the teeth is formed a laterally-extending circular flange, *n*, which latter is turned to fit the socket *i* in the under face of plate D. The inner or under face of flange *n* of clutching-hub E also has formed upon it two depending lugs, *o o*, which, as shown in Figs. 7 and 8, will preferably be formed in the shape of two nearly-semicircular flanges with their ends separated.

When the hub E and plate D are in place, the latter is kept to its seat or socket *a* in the shell or casing by the flange *j* of the cap, the toothed portion of the hub projecting upward through the opening *h* above the face of plate D. It will also be noticed that the lug or arm *l* upon the hub E projects into the recess *k* of the flange *j*, the space or recess *k* connecting with the opening *h* and forming merely a lateral extension or enlargement thereof.

G G indicate two coiled springs, secured at their outer ends to the lugs *d* of shell C and at their inner ends to the lugs *o o* upon the under side of the hub E. Each spring makes about two complete coils, and is conveniently attached to the lugs *d* and *o* by merely forming hooks upon its ends, the springs thereby serving to connect the hub E and the case or shell.

From the above-described construction it follows that as soon as the teeth *m* of the clutch-hub engage with or are engaged by any suitable device for locking the said device and the clutch together—as, for instance, a pawl or a second toothed hub—to cause them to rotate in unison, the clutching-hub E, being free upon shaft B, may rotate a

limited distance thereupon—a distance equal to the length of the recess *k* less that of lug *l*. As the clutching-hub thus begins to rotate the force of the springs G G is overcome, and they are wound up while the lug or arm *l* on the hub is moving the length of recess *k*. As the hub E moves or rotates, it moves the clutch as a whole through or by reason of the springs G G, or, in other words, the hub E yields when the power is first applied, the resistance increasing with the power up to a certain point, when the arm or lug *l* reaches the end of the offset *k*, unless the tension of the spring becomes sufficient to overcome the resistance of the case or shell against rotation, which will of course depend upon what is connected with or moved by said shell or case.

As suggested, it may in some cases happen that the springs will be strong enough to prevent the lug *l* from engaging with the cap-plate, in which case the strain would all come upon the springs; but such construction is not desirable, because of the constant strain upon the springs. It will also be seen that the springs may be so weak or light or the resistance offered by the driven machinery may be so great as to preclude any movement of the clutch-hub until the lug reaches the end of its movement in recess *k*, the springs in such case failing to take up the jar incident to the sudden clutching.

To permit the adaptation of the device to the special work contemplated, it is found desirable to provide for the adjustment of the springs, and this is accomplished by loosening the screws F F, lifting the cap plate D up so that its notches *f* will be out of engagement with the lugs *e*, and then replacing the cap-plate with the lugs *e* in engagement with the notches *f'*, and securing the cap-plate in place. This movement or adjustment of the cap-plate is provided for by the curved slots *g g*, and it will be noticed that when the springs have been thus adjusted the screws F will be in that end of the slots *g g* opposite to that which they occupy in Fig. 1.

It is of course to be understood that as the cap-plate is thus rotated the hub E is likewise rotated, the lug *l*, when the clutch is out of operation, being in engagement with the cap-plate, as shown in Fig. 1, and it is this rotation of the hub with the cap-plate that effects the adjustment or increased tension of the spring as the springs are secured to the hub. The object of making the lugs *o o* on the under face of the hub E in the shape of projecting semicircular flanges is that they form a hub upon which the springs may wind, as shown in Figs. 3, 4, and 5.

Inasmuch as the devices which will engage with or be engaged by the hub E will vary according to the class of machines to which the invention is to be applied, I wish it understood that I do not limit myself to the particular form of clutching-hub shown, it being apparent that the engaging-face of said hub may be constructed in various ways without departing from the spirit or substance of my invention. Likewise I wish it understood that I do not limit myself to the exact construction and arrangement of springs shown, as it is apparent that spiral springs may be used in lieu of those shown.

The clutch herein described and shown is particularly designed for use on that class of machines known as "broadcast seeders," and is found in practice to give excellent results, the construction being simple and cheap and easy of operation. It is equally applicable to grain-drills, hay-rakes, fertilizer-distributers, various machines found in machine-shops; in fact, wherever it is necessary to clutch two parts, one in motion and the other at rest.

By means of the springs which allow a yielding motion to the cluthing-hub all danger of fracture due to the sudden starting of machinery is entirely obviated.

The number of springs may be varied, as may also the number of lugs *d e o* and slots *g*.

I claim—

1. In combination with a shaft, a shell or case secured thereto, a toothed or clutching hub, and intermediate springs connecting said parts, but permitting a limited movement of one relatively to the other.

2. In combination with a shaft, a shell or case rigidly secured thereto, a clutching-hub loosely mounted upon the shaft, and a spring connected at its ends with the shell or case and the hub.

3. In combination with a shaft, a shell or case secured thereto, a clutching-hub loosely mounted upon the shaft and adapted to move a limited distance independently of the shell or case, and a spring connecting the hub and the case or shell.

4. In a clutch, the shell or case, the shaft, the loose hub, and the spring connecting the hub and shell, in combination with devices, substantially as described, for adjusting the springs.

5. In a clutch, the combination, with a shaft, of a shell or case secured thereto, a clutching-hub mounted loosely upon said shaft, a spring connecting the hub and shell, and a cap-plate secured to the case or shell and serving to hold the hub in place.

6. In combination with shaft B, case or shell C, provided with a lug, *d*, and socket *a*, hub E, provided with hub *b*, flange *n*, and lug *o*, spring G, connected at its ends to the lugs *d o*, and cap-plate D, provided with central opening, *h*, and socket *i*, all substantially as shown and described.

7. In combination with shaft B, case or shell C, having lugs *e e*, hub E, provided with lug *l*, springs G, connecting the hub and case, cap-plate D, provided with slots *g g*, and a central opening provided with an offset portion or recess, *k*, and screws F F, connecting the hub and cap-plate.

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