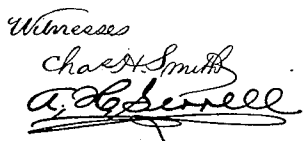


GEARING.

1,042,769.

2 SHEETS—SHEET 1.



Inventors
Thomas Collins.
Louis H Hartmann.
by Harold Terrell
Att'y.

T. COLLINS & L. H. HARTMANN.

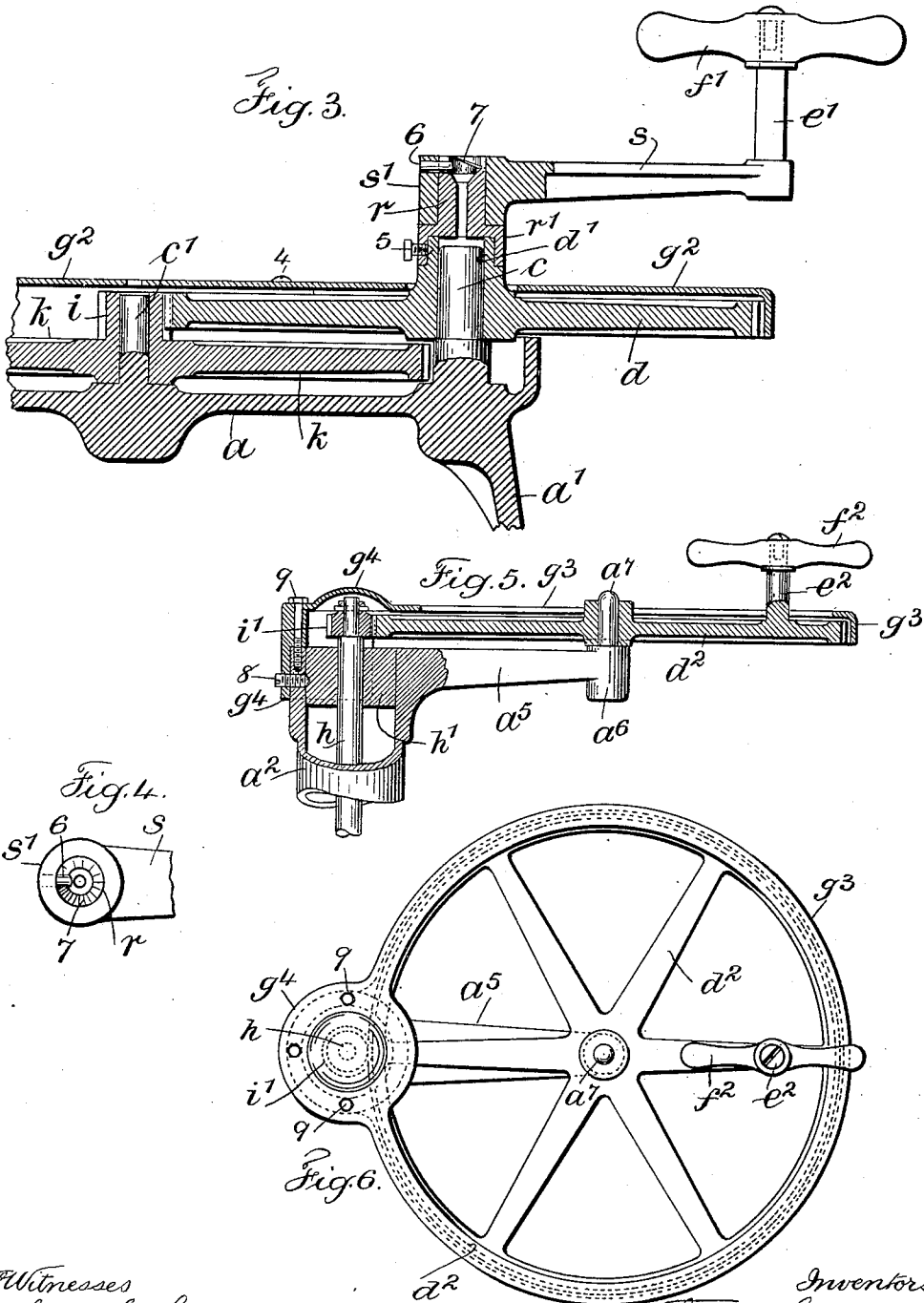
GEARING.

APPLICATION FILED NOV. 6, 1909.

1,042,769.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 2.



Witnesses
Charles Smith
A. Berrell

Inventors
Thomas Collins
Louis H. Hartmann.
 by *Harold Terrell*
 their atty.

UNITED STATES PATENT OFFICE.

THOMAS COLLINS AND LOUIS H. HARTMANN, OF BAINBRIDGE, NEW YORK, ASSIGNORS
TO AMERICAN SEPARATOR COMPANY, OF BAINBRIDGE, NEW YORK, A CORPORATION
OF NEW YORK.

GEARING.

1,042,769.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed November 6, 1909. Serial No. 526,505.

To all whom it may concern:

Be it known that we, THOMAS COLLINS and LOUIS H. HARTMANN, both citizens of the United States, residing at Bainbridge, in the county of Chenango and State of New York, have invented an Improvement in Gearing for Imparting Rotary Movement at High Speed, of which the following is a specification.

Our invention relates to a gear device manually operated for imparting rotary movement at a high speed to an object, and our invention is particularly applicable to centrifugal cream separating devices, and the same is also an improvement upon the device shown and described in Letters Patent of the United States granted to the American Separator Company as the assignee of Thomas Collins and Ernest L. Hartmann, August 20, 1907, No. 863,905.

The object of our invention and the advantage to be gained by the device embodying the same lies in the reduction of the number of parts to be manufactured, placed in the machine and operated, the reduction of friction, the expense of construction and the advantage to be gained by a direct application of the power applied particularly in a sitting posture of the operator instead of the application through intermediate bevel gearing as in the device of the aforesaid patent.

In the device of our invention we employ many parts similar to and having the same function as those shown and described in said patent. In the place of the bevel gears and the intermediate toothed wheel, we employ a spur gear in a horizontal plane in mesh with a pinion in the same plane and connected with the power applying devices, and we provide a handle directly associated with and for actuating said spur gear upon which both of the hands of the operator can be placed for the revolution of the spur gear, thereby availing of the power of both hands and arms instead of the power of only one hand and arm.

The spur gear is covered to prevent con-

tact therewith of the clothing, limbs or hands, as such contact would be liable to cause injury.

The device can be secured to a suitable platform or floor and be actuated by the operator in a sitting position with both hands grasping the handle and on a plane slightly below the plane of the shoulders.

In the drawing, Figure 1 is a vertical section and partial elevation representing the features of our improvements. Fig. 2 is a plan of the guard covering the spur gear. Fig. 3 is a vertical section showing a form of our invention and Fig. 4 a plan of a portion thereof. Fig. 5 is a vertical section showing the devices of our present invention as applied to the upper end of the machine of our aforesaid patent and Fig. 6 is a plan of the same.

Similar letters of reference are employed to designate similar parts.

In our invention as exemplified in Figs. 1 and 3, we provide what may be termed a low level drive in which the machine is particularly adapted for household purposes and is adapted to be operated by a person in a sitting position, and this in contradistinction to the device shown in Figs. 5 and 6 and also the devices shown in our aforesaid patent where the machine is particularly adapted for creamery establishments and is a high level drive machine.

Referring particularly to Figs. 1 and 3, a represents a low base or body frame supported upon legs a^1 which may be secured to a suitable platform or flooring not shown. a^2 represents a hollow guard for the bowl of the centrifugal cream separator, in connection with which b^1 is the vertical shaft of the separator and b^2 a bearing in the base of the guard. From the lower end of the vertical shaft b^1 extends an auxiliary shaft m on which is fixed a pinion k^1 of small dimensions. The base or body frame a is provided with a bearing sleeve a^4 in which is a bearing block 3 receiving the lower end of the auxiliary shaft m and a pin n passes up into the bearing sleeve 3, is screw-threaded

in its relation thereto for its adjustment and is recessed at its upper inner end for a ball o upon which the lower end of the auxiliary shaft m rests. This bearing block 3 is held in the bearing sleeve a^4 by a set-screw 2. The base or body frame a is provided with studs c c^1 in a vertical position preferably formed integral therewith and rising therefrom; the stud c being in a higher plane than the stud c^1 . A spur gear k provided with a pinion i formed therewith or secured thereto, is mounted upon the stud c^1 and the spur gear k meshes with the pinion k^1 upon the arbor or shaft of the cream separator bowl.

We provide a large spur gear d mounted upon the stud c of the body frame a in a horizontal position; the same resting upon the shoulder at the base of the stud and turning about the stud and meshing with the pinion i of the spur gear k . As shown in Fig. 1, this spur gear d is provided with a stud e in a vertical position secured to the spur gear in any desired manner and preferably reduced slightly at its upper end to receive a handle f centrally mounted thereon and adapted to be grasped by the hands of the operator, with the upper end of the stud in its connection with the handle coming between the hands. This handle f is also in a horizontal position and is removably held in place by a central screw or suitable device.

With the object of protecting the clothing, the hands or limbs of the operator from contact with the teeth of the spur gear d , we provide a guard g in the form of a circular annulus which covers the teeth and extends slightly inward over the periphery of the spur gear d , and we form with this guard a cover g^1 which extends over and above the stud c^1 , the pinion i and a part of the gear k , in part curved and surrounding the periphery of the bowl guard a^3 . The same is secured to the upper edge of the body frame or base a by tap bolts or screws 4 which pass through the said cover g^1 near the edges thereof and hold the cover part to the body frame; the annulus guard g being supported in turn from the cover.

Referring to the form of our invention shown in Fig. 3, the parts a a^1 c c^1 k i and d are the same as the parts shown in Fig. 1, except that the stud c is longer, or in other words, rises higher above the body frame, and the hub of the spur gear d is provided with a sleeve d^1 that is shouldered to receive the hollow base r^1 of a hub r ; the base r^1 being secured by a locking bolt or set-screw 5 to the upper shouldered end of the sleeve d^1 and we provide a crank arm s with a hub s^1 received over the hub r and the upper end of the hub r is provided with a circumferential cam tooth 7 and the hub s^1 of the crank arm with a radial pin 6 passing

through the same and within the same to a bearing on the surface of the cam tooth 7. This crank arm s is of a length sufficient to agree substantially with the full radius of the spur gear d , and to the hub on the outer end thereof, we attach a vertically disposed stud e^1 to which is secured a handle f^1 ; the stud e^1 and the handle f^1 being in all respects substantially the same and performing the same function as the stud e and the handle f in Fig. 1.

In the form of our invention shown in Fig. 3, it will be noticed that the guard g^2 is also a cover extending entirely over the spur gear d and at its periphery down over and inclosing the teeth of said gear so as to fully and completely protect the operator and the clothing of the operator from contact with the teeth of the spur gear. The crank arm s , its hub s^1 and the stud and handle connected therewith are readily removable from the hub r as they seat loosely over the same and in the operation of this form of our invention, this crank arm is turned by the handle and stud; the pin 6 in turning bearing against the upright or toothed face of the cam 7 in the direction of rotation serves to rotate the hub r , its base r^1 , the sleeve d^1 and the spur gear d and the parts with which the spur gear is in mesh, and should the crank arm s with the handle and stud be arrested in its movement from any cause whatsoever, no damage can result because while the spur gear d keeps on its rotation, the cam 7 undercuts the pin 6 with each rotation, alternately lifting the pin and the crank arm and dropping the same over the surface of the tooth. It is also quite apparent that in this form of our invention the crank arm, handle and stud may be removed when it is not desired to operate the machine.

In the form of our invention shown in Figs. 5 and 6, we have illustrated the hollow standard a^2 , the main vertical shaft h and its bearing h^1 in the hollow standard and the pinion i^1 from the type of high level drive machine shown in our aforesaid patent, and in order to dispense with the bevel gear shown in said patent and apply to this high level drive machine the devices of our present invention, we provide an arm a^5 extending out from the upper end of the hollow standard a^2 with a boss a^6 on its free end from which rises a stud a^7 . On this stud a^7 is mounted a large spur gear d^2 which meshes with the pinion i^1 upon the upper end of the shaft h and a stud e^2 is connected to or formed with one of the spokes of the large spur gear d^2 and is reduced at its upper end to receive the handle f^2 ; the handle being connected approximately at its center so as to leave a hand space at each side of the stud. In this device we also employ a

guard in the form of a circular annulus g^3 and integral cap g^4 ; the cap in turn being provided with a skirt member surrounding the top of the hollow standard a^2 outside of the projection therefrom of the arm a^5 ; the periphery of the guard g^3 covering over the periphery of the large spur gear and the teeth thereon. Tap bolts 9 pass vertically through the cap g^4 into the upper edge of the hollow standard to secure said parts in position and a screw-pin 8 is shown as employed passing through the cap and the hollow standard into the bearing h^1 to hold the same in position.

In all the forms of our invention, the essential features are the large spur gear in direct mesh with part of the power mechanism, a handle for both hands connected to the spur gear and a guard covering at least the periphery of the spur gear to protect the operator from contact therewith.

From the foregoing it will be apparent that in all the instances described with reference to the construction of the stud and handle, that the handle is removably held in place by a central screw or equivalent device and also that the gearing up from the spur gear d to the shaft b^1 of the separator bowl b is calculated to provide a high speed of rotation for said centrifugal separator bowl.

Considered in its relation to the parts shown in Figs. 1 and 3, the body frame is the equivalent of the hollow standard a^2 and its arm a^5 , the stud c the equivalent of the stud a^7 and the stud c^1 for the performance of like function the equivalent of the shaft h , the pinion i and spur gear k turning as effectively in the device Figs. 1 and 3 as does the pinion i^1 , shaft h and spur gear k in the device shown in Fig. 5 and our aforesaid patent.

While we have shown and described the features of our improvement with special reference to a centrifugal cream separator device, it is obvious that the features of our improvement are equally well adapted to gearing for imparting rotary movement at high speed in any mechanical structure or machine employing gearing and requiring high speed to be imparted to the devices forming part thereof.

While it is necessary for the pinion i and gear k and also for the spur gear d to have studs or arbors for their rotation, it is not obligatory that the studs c c^1 be made as parts of the body frame.

We claim as our invention:

1. The combination with a suitable standard or body frame structure, and a pinion and spur gear connected to turn together and forming part of the power mechanism, of a spur gear meshing with said pinion and in the same plane, a support for said spur

gear and a handle device operatively secured to said spur gear and radially positioned so as to be approximately over the peripheral teeth thereof to be grasped by the hand for its rotation, and a circular annulus guard and support members of integral construction and means for securing the same to the aforesaid body frame or standard, whereby the annulus guard extends around the teeth of the spur gear covering the same and the support member forms a support therefor also covering other exposed parts.

2. The combination with a suitable standard or body frame structure, and a pinion and spur gear connected to turn together and forming part of the power mechanism, of a spur gear meshing with said pinion and in the same plane, a support for said spur gear, a revoluble centrally pivoted handle device operatively secured to said spur gear and radially positioned so as to be approximately over the peripheral teeth thereof to be grasped by the hand for its rotation, and a circular annulus guard and support member of integral construction and means for securing the same to the aforesaid body frame or standard, whereby the annulus guard extends around the teeth of the spur gear covering the same, and the support member forms a support therefor also covering other exposed parts.

3. The combination with a suitable standard or body frame structure, and a pinion and a spur gear connected to turn together and forming part of the power mechanism, of a spur gear meshing with said pinion and in the same plane, a support for said spur gear and a handle device to be grasped by both hands, removable from its support and operatively secured to said spur gear and radially positioned so as to be approximately over the peripheral teeth thereof to be grasped by the hands for its rotation, and a circular annulus guard and support member of integral construction and means for securing the same to the aforesaid body frame or support, whereby the annulus guard extends around the teeth of the spur gear covering the same and the support member forms a support therefor also covering other exposed parts.

4. A device for imparting rotary movement at high speed, comprising a low body frame, means for supporting the same in a horizontal position, a device to be rotated at high speed, means for supporting and a pinion for actuating the same, a spur gear and pinion connected together and a stud of the body frame upon which the same are mounted in a horizontal position with the teeth of the spur gear in mesh with the first aforesaid pinion, another stud connected with said body frame in a higher plane, a spur gear mounted on said stud and mesh-

ing with the pinion connected with the first spur gear, and a stud and handle centrally pivoted thereto and operatively connected with the latter spur gear for imparting power and rotation thereto, and a circular annulus guard extending over the teeth of the latter spur gear and a cover preferably formed integral with said guard and extending over other exposed parts to cover and protect the same, and the cover member secured to the body frame.

Signed by us this 30th day of Oct., 1909.

THOMAS COLLINS.
LOUIS H. HARTMANN.

Witnesses:

STANLEY BEAGLE,
EARL A. WESTCOTT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."