

No. 759,291.

PATENTED MAY 10, 1904.

F. H. LIPPINCOTT.
FEED MECHANISM.

APPLICATION FILED AUG. 24, 1903.

NO MODEL.

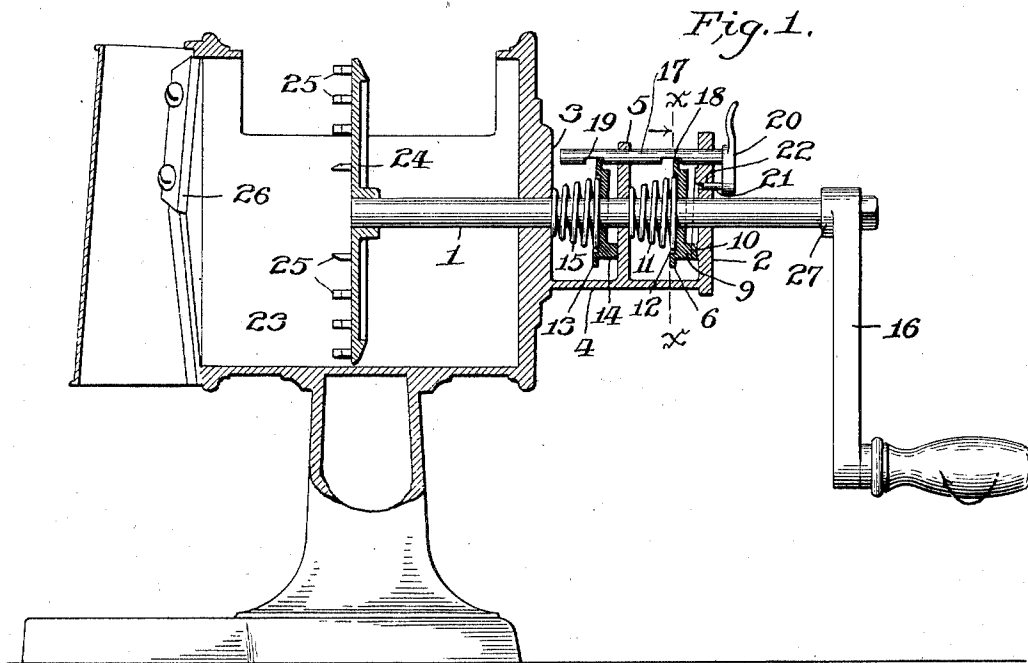


Fig. 2.

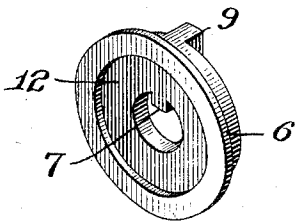


Fig. 3.

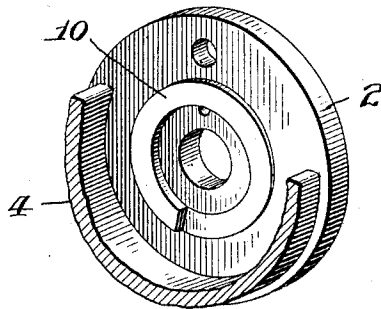
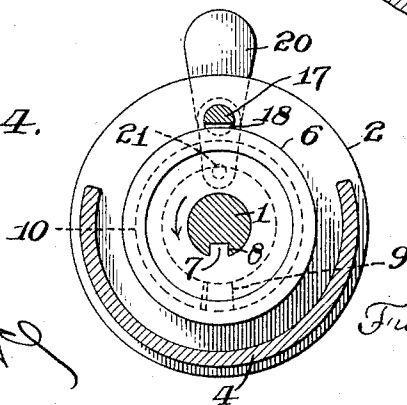


Fig. 4.



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FEED MECHANISM.

SPECIFICATION forming part of Letters Patent No. 759,291, dated May 10, 1904.

Application filed August 24, 1903. Serial No. 170,539. (No model.)

To all whom it may concern:

Be it known that I, FISHER H. LIPPINCOTT, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Feed Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a longitudinal section showing the device applied to an ice-shaving machine. Fig. 2 is a perspective, enlarged, of one of the shaft-disks detached. Fig. 3 is an enlarged perspective of the inner side of the rear head of the frame broken away, showing the cam-face thereon. Fig. 4 is an enlarged section on line *xx*, Fig. 1.

The object of this invention is to provide a simple and efficient means for automatically effecting the gradual advance (similar to that effected by a screw-thread, but dispensing with a screw-thread) of a rotatable shaft in its bearings, yet permitting the same to be readily and quickly slid back or forth longitudinally in said bearings when desired and to any extent required.

The leading feature of the invention comprises, in combination with a rotatable shaft, a disk mounted loosely thereon and adapted to rotate therewith, a fixed cam against which a projection on the side of said disk is adapted to ride, and a spring pressing against the latter, the construction being as hereinafter described, whereby diagonally opposite edges of the wall of the opening of the disk through which the shaft passes are caused to bite the shaft, and thereby hold the same, while the said cam causes the disk to carry the shaft forward to an extent equal to the pitch of the cam with each revolution of the shaft, the disk taking a fresh bite on the shaft at the end of each complete revolution of the latter.

The invention also comprises, in combination with the foregoing, means for preventing any backward sliding of the shaft during the slight intervals between the bites of the disk thereon—that is, during the instant when the

aforesaid projection of the disk passes from the high to the low portion of the cam.

The invention further relates to certain details hereinafter described and particularly pointed out.

In the drawings, 1 is a shaft, preferably of hard brass, that is free to rotate and also to slide lengthwise in bearings of heads 2 and 3 of a frame 4 and passes through a plate or partition 5 of the latter. Mounted loosely upon said shaft is a disk 6, preferably of hard steel, which is adapted to rotate with the shaft, being splined thereon by a feather 7, Figs. 2 and 4, entered into a longitudinal slot 8, Fig. 4, of the shaft. The said disk has a part or projection 9 near its periphery that bears against an angular cam-face 10 upon the inner side of the frame-head 2, being maintained in such contact by the stress of a spring 11, encircling the shaft between the disk and the partition 5. This spring, or rather the end bearing against said disk, is made, preferably, of considerably larger diameter than the shaft, so that it will bear against the disk near its periphery, and in order to maintain it (the spring) in such position that end of the spring is seated in a groove or depression 12, Figs. 1 and 2, of the disk concentric with the latter.

In front of the partition 5 is a disk 13, also mounted on shaft 1 and identical with disk 6, having a projection 14, that is caused to bear against the plane side of said partition by the stress of a spring 15, (similar to spring 11,) one end of which abuts against the disk and the other against the frame-head 3. This disk 13 is splined upon the shaft in the same way as disk 6; but it is not essential that it should be splined thereon, as will be understood when its function has been explained.

Having described the important features of the invention, I shall now describe the mode of operation thereof, as follows: It will be observed that by reason of the disks 6 and 13 being loose upon shaft 1 and the respective projections 9 and 14 thereof being some distance from the shaft, the tendency of the springs 11

and 15 is to cant the disks to a position oblique to the shaft, as seen in Fig. 1, and thus to cause the rear edge of the wall of the opening of the disks through which the shaft passes on the side opposite to the said projections and the forward edge on the other side to bite the shaft. If now the shaft be rotated (by a crank 16, Fig. 1, on the end thereof) in the direction of the arrow in Fig. 4, assuming that the projection 9 of disk 6 is then contacting with the lowest part of cam 10, the said disk, carrying with it the shaft, will at the end of a complete revolution have gradually advanced the latter a distance equal to the pitch of the cam, and so on, with each revolution of the shaft as soon as the projection 9 passes from the highest to the lowest part of the cam.

The sole purpose of the forward disk 13 is through its continuous bite upon the shaft to prevent the retraction of the latter in case there should be any back pressure thereon that otherwise would slide back the shaft at the instant the projection 9 of disk 6 recedes from the high to the low part of the cam, during which instant the said disk, taking a position at right angles or thereabout to the shaft, releases its bite on the latter.

Although the bite of the disks prevents a backward movement of the shaft, it (the shaft) may be readily slid forward by the hand to any desired extent, as obviously the drawing or pushing forward of the shaft will release the bite of the disks.

To permit the shaft to be slid back, it is merely necessary to release the bite of the disks by rocking forward the same on their respective fulcra—*i. e.*, the points of contact of the projections 9 and 14—first bringing the shaft and disks about in the position shown in Fig. 1—that is, the last-mentioned projection bearing against the lower portion of the cam 10.

As a means for conveniently releasing the bite of the disks when desired I employ a rod 17, that is slidably mounted in the frame-head 2 and the partition 5 and is cut away on the under side to form two slots 18 and 19, into which respectively project the edges of the disks 6 and 13, as seen in Fig. 1. On the outer end of said rod is a head 20, the upper part or limb of which is for convenience in sliding the rod to and fro, and a pin 21, projecting from the lower part or limb and entered into a hole 22 in the frame-head 2, prevents the rod from turning. By pushing forward the said rod the rear wall of the slots 18 and 19, impinging against the disks, respectively rocks forward the latter to the releasing position, and the shaft is slid backward while the disks are maintained in that position. Upon releasing the rod or disks the springs will return the disks to the normal or biting position. A suitable stop prevents the latter from being tilted too far—that is, farther than is necessary to release their bite on

the shaft. In the present instance the said stop is formed by the end of rod 17 contacting with the frame-head 3 when said rod is pushed forward.

My invention is particularly useful when applied to ice cutting or shaving machines—such, for example, as that shown in Fig. 1—wherein the shaft 1 extends into a cylindrical receptacle 23, supported by a suitable base, and which shaft has fixed thereon at its inner end a plate or head 24, having pins or projections 25 on the front side that are adapted to engage a lump of ice placed in front of the plate 24 and cause the ice to be carried around and gradually advanced by the rotating shaft against suitable cutting or shaving knives 26, fixed at the forward end of the receptacle.

In order to limit the forward movement of shaft 1, (in the present instance so as to prevent the projections 25 of plate 24 from coming into contact with knives 26,) I provide means whereby when the shaft has been advanced a predetermined distance the disks 6 and 13 will be caused to release their bite upon the shaft. One such means consists of a collar 27 (which may be, as shown in the drawings, the hub of the crank 16) on the shaft 1, at such distance from the end of rod 17 or the head 20 thereon that said collar coming against the rod or said head and pushing forward the rod will cause the latter to rock the disks, and thus release their bite on the shaft at the required instant, which in this instance is just before the projections 25 would otherwise strike the knives.

The disk 13 may sometimes be dispensed with; but its presence will usually be necessary or at least desirable.

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

1. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the disk mounted loosely on said shaft and rotatable therewith and having the projection adapted to contact with said cam, and the spring pressing against said disk, substantially as and for the purpose set forth.

2. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the disk mounted loosely on said shaft and rotatable therewith, and having the projection adapted to bear against said cam, the spring pressing against said disk and maintaining said projection in contact with the cam, and the spring-pressed disk mounted loosely on said shaft, and having the projection contacting with a plane surface of said frame, substantially as and for the purpose set forth.

3. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-pressed disk mounted loosely upon and rotatable with said shaft, and having the projection contacting with said cam, and means adapted to act upon

said disk to cause the same to release its bite on the shaft, substantially as and for the purpose set forth.

4. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-pressed disk mounted loosely upon and rotatable with said shaft, and having the projection contacting with said cam, the spring-pressed disk mounted loosely upon said shaft, and having the projection contacting with a plane surface of said frame, and means adapted to act upon said disks for simultaneously causing the same to release their bite upon the shaft, substantially as and for the purpose set forth.

5. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-pressed disk mounted loosely upon and rotatable with said shaft, and having the projection contacting with said cam, and means for releasing the bite of said disk on the shaft, adapted to be actuated by said shaft in its forward movement, at a predetermined time, substantially as and for the purpose set forth.

6. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-controlled disk mounted loosely on said shaft and having the projection contacting with said cam, the spring-controlled disk mounted loosely on said shaft and having the projection contacting with a plane surface of said frame, and means for simultaneously releasing the bite of said disks on the shaft at a predetermined time, actuated by said shaft in its forward movement, substantially as and for the purpose set forth.

7. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-controlled disk, mounted loosely upon, and rotatable with said shaft, and having a projection contacting with said cam, and means for automatically releasing the bite of said disk on the shaft at a pre-

determined time, by the forward movement of the latter; said means consisting of the movable rod adapted to engage said disk and a collar on said shaft adapted to engage said rod, substantially as and for the purpose set forth.

8. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-controlled disk mounted loosely upon and rotatable with said shaft, and having the projection contacting with said cam, and means for releasing the bite of said disk on the shaft consisting of the movable rod adapted to engage said disk, substantially as and for the purpose set forth.

9. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the spring-controlled disk mounted loosely on said shaft and having the projection contacting with said cam, the spring-controlled disk mounted loosely on said shaft and having the projection contacting with a plane surface of said frame, the slidable rod having parts adapted to engage said disks respectively, and a collar on said shaft adapted to engage said rod at a predetermined time in the forward movement of said shaft, substantially as and for the purpose set forth.

10. The combination of the rotatable, slidable shaft, the frame in which the same is journaled, the cam, the disk mounted loosely upon and rotatable with said shaft, and having the projection adapted to contact with said cam, the disk-controlling spring encircling said shaft and having its end of considerably larger diameter than said shaft and entered into a recess of said disk, substantially as and for the purpose set forth.

In testimony whereof I have hereunto affixed my signature this 29th day of July, A.D. 1903.

FISHER H. LIPPINCOTT.

Witnesses:

A. O. WINCHESTER,
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