Oct. 13, 1925.

1,556,582

N. E. BOOTH

INTERMITTENT FEEDING DEVICE

Filed Aug. 3, 1922

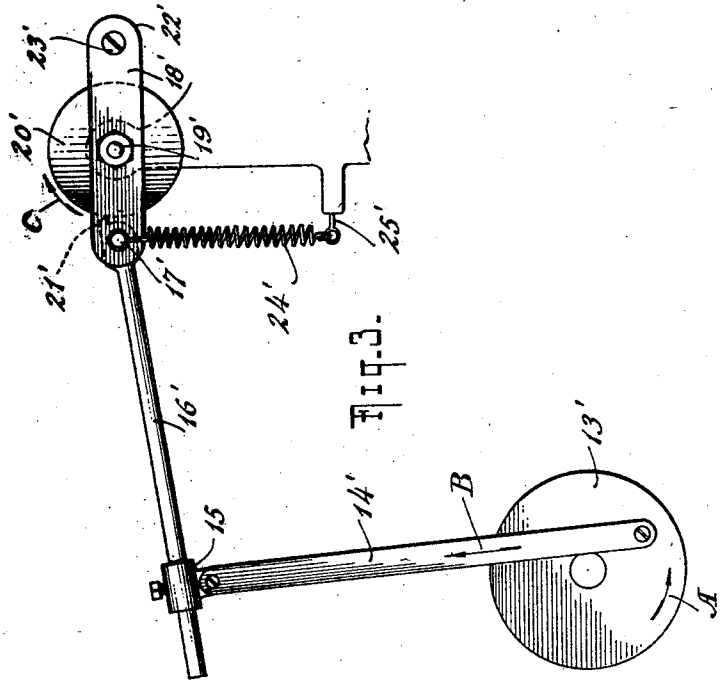

Fig.3.

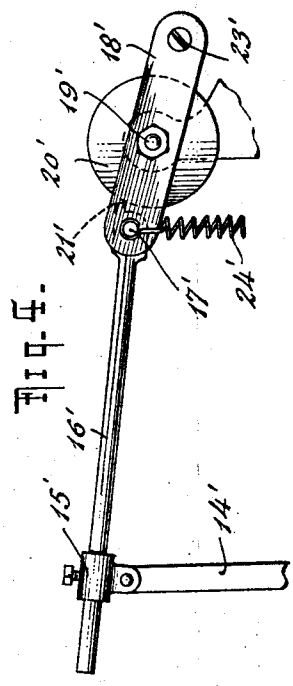

Fig.4.

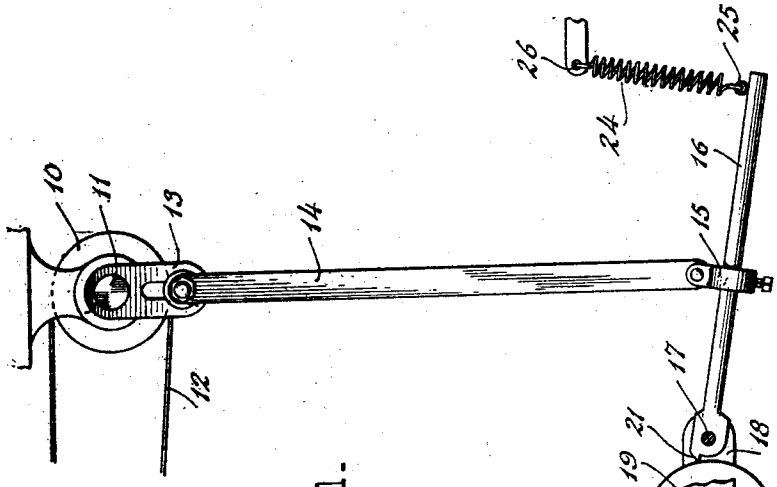

Fig.1.

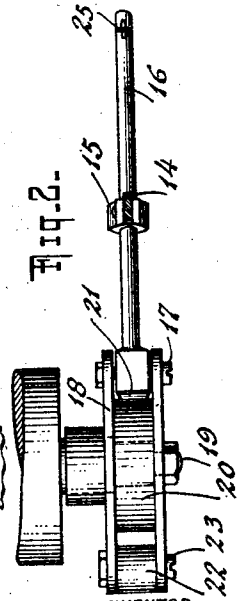

Fig.2.

INVENTOR
NELSON E. BOOTH

BY Richards & Geier.
ATTORNEYS

Patented Oct. 13, 1925. 1,556,582

UNITED STATES PATENT OFFICE.

NELSON E. BOOTH, OF BROOKLYN, NEW YORK.

INTERMITTENT FEEDING DEVICE.

Application filed August 3, 1922. Serial No. 579,509.

To all whom it may concern:

Be it known that I, NELSON E. BOOTH, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Intermittent Feeding Devices, of which the following is a specification.

The intermittent feed devices in the form of pawl and ratchet wheels while of quite general application are subject to the following serious objections; if because of the provision of the ratchet teeth any variations of the feeding strokes are necessarily limited and predetermined by the distance between the adjacent teeth of the wheel, consequently if the relative movement or stroke between the wheel and pawl is adjusted to feed a distance for example equal to 3½ teeth of the ratchet wheel, the pawl will only feed three teeth or it will sometimes feed three teeth and at other times feed four teeth. It will thus be seen that the extent of the feed can not be varied within narrow limits except by reducing the number of teeth upon the ratchet wheel which involves reducing the size of the teeth and consequently the strength thereof, so that it becomes impossible to use the smaller teeth if any great amount of resistance is offered to the feeding action of the device. It has also been proposed to use a toothed pawl or a similar serrated feeding member which engages a wheel having a plane surface.

The principal object of the present invention is to provide an intermittent feed device which will overcome the objectionable features of the constructions above described and to provide an intermittent feed device which can be adjusted to produce a feeding movement of the smallest fractional parts of an inch and to so construct the device that the feeding movement will at all times be positively produced and may therefore be accurately determined according to the desired conditions.

A further object is to so construct a device of this character that the engaging pressure between the pawl and cooperating wheel will be proportioned to the amount of resistance offered by the feeding member actuated by the wheel.

For the accomplishment of these and such further objects as will hereinafter be apparent to those skilled in the art to which this appertains, the invention consists in the construction, combination and arrangement of parts herein specifically described and illustrated in the accompanying drawings, wherein is shown a preferred embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the claim hereunto appended.

In the drawings, forming a portion of this specification—

Fig. 1 is a side elevation of a feeding device embodying my invention.

Fig. 2 is a top view of the structure shown in Fig. 1.

Fig. 3 is a side view similar to Fig. 1 of a modification showing the device at the beginning of a feeding stroke.

Fig. 4 is a side view of the structure shown in Fig. 3 at the end of the feeding stroke.

As shown in Figs. 1 and 2 of the drawings, the numeral 10 indicates a driving pulley mounted upon a shaft 11, a belt 12 being trained about the pulley 10 and a suitable driving pulley (not shown). Mounted upon the end of the shaft 11 is a crank arm 13 to which is adjustably secured the upper end of a pitman rod 14, the lower end of which is pivotally connected to a yoke bracket 15 adjustably mounted upon a toggle link 16 pivoted as at 17 to a pair of plates 18 forming the companion toggle link. The plates 18 are pivotally mounted upon a shaft 19 upon which is fixedly secured a feed wheel 20 preferably constructed of phosphor bronze or similar material and having its periphery turned off to provide a smooth surface with which is adapted to engage the toothed end 21 formed upon the inner end of the toggle link 16. A spacing block 22 is clamped between the plates 18 by means of the bolt 23 to hold the plates rigidly in position, the thickness of the spacing block being suitably proportioned to provide sufficient clearance between the inner faces of the plates and the side face of the feeding wheel, and thereby permit the free movement of the plates about their pivotal mounting upon the shaft 19. Suitable resilient means such as the coiled spring 24 is provided one end of which is secured as at 25 to the toggle link and the other end of which is anchored as at 26 to any suitable stationary support.

In the form shown in Figs. 3 and 4, the construction of the members 14′ to 23′ is

the same as that shown in Figs. 1 and 2, the driving crank disc 13′ for the pitman 14′ in this form being located below instead of above the feeding device, and the spring 24′ in this form being attached to the pivot 17′ instead of at the outer end of the rod 16′.

The operation of the device will be described with reference to Figs. 3 and 4 of the drawing, assuming that the parts are in the position shown in Fig. 3 and that the crank disc is rotating in direction indicated by the small arrow A, the pitman 14′ will move upwardly in the direction of the arrow B, and will cause the toggle link 16′ to move upwardly about its pivot 17′. The pivot 17′ is mounted in the plates 18′, which are pivoted to rotate about the shaft 19′ and the upward movement of the toggle link 16′ would normally cause the pivot 17′ and plates 18′ upwardly in a direction to break the toggle if it were not for the presence of the spring 24′ which resists this upward movement and causes the toothed end 21′ to be held in engagement with the circumferential face of the wheel 20′. The action of the spring 24′ as will be obvious tends to force the toggle formed by the links 16 and plates 18 into alignment to the position shown in Fig. 4, which action is increased by the resistance offered to the rotation of the wheel 20′, by the parts actuated thereby. Due to the holding of the tooth 21′ in firm engagement with the wheel 20′, the upward movement of the link 16 will cause the tooth to immediately dig into the wheel and cause it to move in the direction of the arrow C. The resistance offered by the wheel will be communicated to the tooth along the periphery of the wheel which resistance obviously will be in the opposite direction to the rotation of the wheel and will exert its force substantially at the central pivot 17′ of the toggle in a direction to straighten the same. It will thus be seen that the resistance offered to the feeding movement is directly applied to increase the gripping action of the feeding device and that consequently the extent of the feed will always be positively and accurately accomplished. It will also be obvious that the extent of the feed can be readily adjusted or varied to the thousandth part of an inch if desired by merely moving the brackets 15 or 15′ along the rods 16 or 16′ or by adjusting the point of connection of the rod 16 or 16′ to the crank 13 or crank disc 13′ respectively. The downward motion of the pitman 14′ will cause the toggle to break and immediately release the tooth 21′, the link 16′ swinging about the pivot 17′ as will be readily understood.

In the form shown in Figs. 1 and 2, the connection of the spring 25 at the outer end of the link 16 will cause the link to fulcrum about the pivot 17 to cause the tooth 21′ to normally engage the wheel 20, the pivotal connection of the link 14 with the bracket 15 permitting the link to fulcrum about the pivot 17.

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

In an intermittent feeding device, a shaft, a rotatable feeding wheel provided with a smooth circumferential face mounted on said shaft, a toggle link pivoted upon said shaft, a second toggle link pivotally connected to the first named toggle link adjacent the circumferential face of said wheel, said second link having a toothed end, and means having one end connected to a fixed support and its other end to the pivotal connection between said links to normally force said links into alignment and said toothed end into engagement with said wheel.

In testimony whereof I have affixed my signature.

NELSON E. BOOTH