H. KAETKER.

SWING SAW.

APPLICATION FILED JUNE 13, 1919.

1,332,558.

Patented Mar. 2, 1920.

2 SHEETS—SHEET 1.

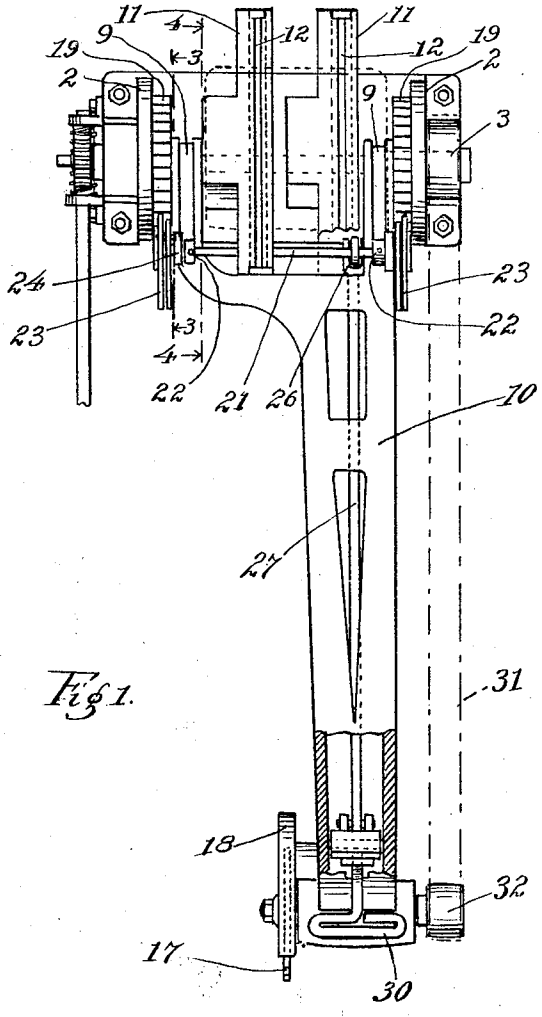


Fig 1.

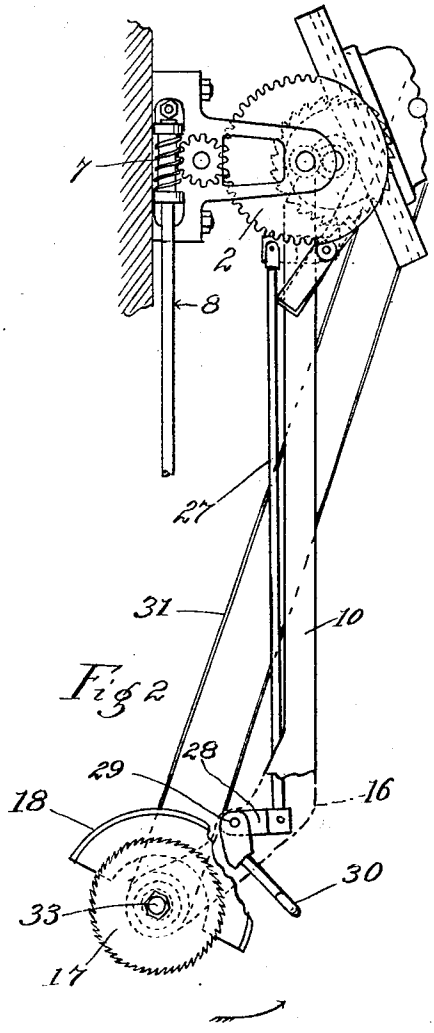


Fig 2

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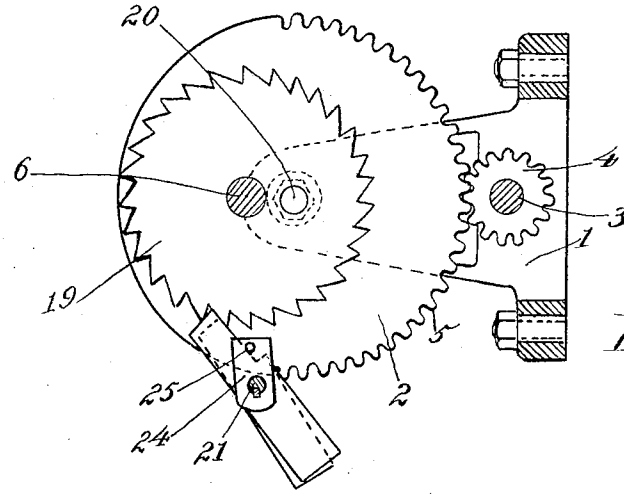


Fig. 3.

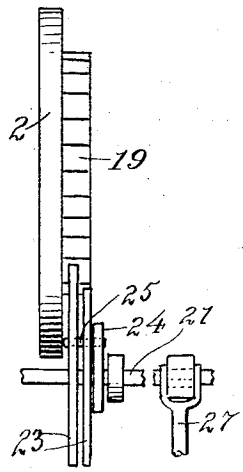


Fig. 5.

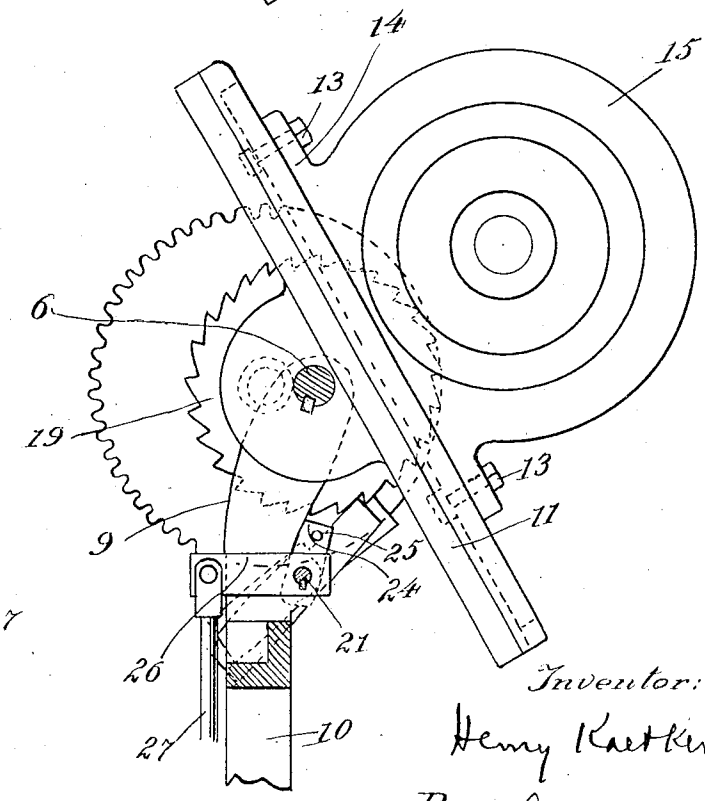


Fig. 4

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UNITED STATES PATENT OFFICE.

HENRY KAETKER, OF CINCINNATI, OHIO.

SWING-SAW.

1,332,558. Specification of Letters Patent. Patented Mar. 2, 1920.

Application filed June 13, 1919. Serial No. 303,831.

To all whom it may concern:

Be it known that I, HENRY KAETKER, a citizen of the United States, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Swing-Saws, of which the following is a full, clear, and exact description, reference being had to the drawings accompanying this specification.

My invention relates to swing saws, wherein the blade is revolved through the agency of an electric motor, and can be swung over the work, by an operator.

It is my object to provide a swing saw of improved construction over those of the prior art, in which more particularly, the swing arm is of novel shape, the electric motor is employed as a counterbalance in an easily controllable manner, and in which a safety device is provided which prevents the movement of the swing arm toward the operator unless he positively draws it toward him by the operating handle.

These objects and other advantages which will be noted I provide by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings,

Figure 1 is a front elevation of the device.

Fig. 2 is a side elevation thereof.

Fig. 3 is a detail section on a larger scale taken on the line 3—3 of Fig. 1.

Fig. 4 is a like section taken on the line 4—4 of Fig. 1, looking in the opposite direction to Fig. 3.

Fig. 5 is a detail front elevation of the parts involved in the safety stop device.

My device as shown, is adapted to be mounted on a side wall in the factory by means of a pair of brackets 1, 1, which in turn revolubly support the mounting plates 2, 2. A shaft 3 extends across between the brackets, and has on each end a pinion 4, which meshes with the teeth 5 of the plates, and an additional pinion 4, by means of which the shaft 3 is revolved.

The disks carry, eccentrically, the shaft 6 which is the supporting shaft for the motor and swing arm, and it can be seen that by revolving the pinions 4, the position of the shaft 6 will be changed, this vertical displacement being limited by the degree of eccentricity of the shaft 6 to the center of revolution of the disks 2. This revolution of the pinions is accomplished by a worm 7 journaled on the side of one of the brackets, and meshing with the outer one of the pinions 4 (Fig. 2). This worm is operated by revolving the shaft 8 thereof, by any suitable hand wheel mounted thereon (not shown). The worm will serve as a lock to the position of the main shaft 6 since it is nonreversible except when positively operated.

Keyed to the shaft 6 are the brackets 9 of the swing arm 10 and also keyed on this shaft are the motor mounting rails 11. These rails are independent of each other and can be moved along the shaft 6 to accommodate the base of a desired motor.

The rails have slots 12 therein, through which pass the bolts 13 of the motor base 14.

By adjusting the bolts 13 the motor 15 can thus be slid along the rails and secured in place where desired. I set the rails at an angle to the vertical so that the shifting of the motor along the rails will increase or decrease its distance from the shaft 6 whereby I provide a counterbalance for the swing arm and also take up small amounts of belt slack.

It should be particularly noted that the swing arm 10 is formed with an elbow 16 and that the saw 17 is journaled in the arm beyond this elbow so that when the operator swings the arm toward him the elbow will precede the saw and the driving belt and if any portion of the device strikes the operator it will be this elbow and not the saw. The saw is shown as provided with the usual guard 18.

The elbow 16 not only provides the factor of safety above noted, but also strengthens the arm, as the bend is opposed to the operating strain. The conformation of the arm, furthermore, permits the main body thereof to assume an approximately vertical position when at rest with the saw disengaged from the work.

Coming to the locking device for the swing arm, this lock is released by the operator when he pulls over the arm, and comes into operation to stop the movement of the arm toward the operator the instant that he ceases to draw the arm toward him positively.

My preferred embodiment of this lock is as follows; secured along with the mounting plates 2, 2 of the device are ratchet wheels 19, 19. The ratchet wheels are held in fixed

relation to the plates 2 by means of the stud or stub shafts 20 which mount the plates 2 centrally on their brackets and by the shaft 6 which passes through plates 2, said shaft 6 also passing through the center of the ratchets 19.

Pivotally mounted on a shaft 21, which is journaled on the swing arm by means of brackets 22, are the pawls 23. There are four of these pawls each one of slightly different length and they are held in mesh with ratchet 19 by gravity. There are two pawls bearing against the face of each ratchet, said ratchets being made wide enough for the purpose. It should be noted of these pawls and ratchets that they are arranged to prevent the swing arm from moving toward the operator and thus, that the pawls must be disengaged for the saw to be used. More or less than two pawls could readily be used for each ratchet as will be apparent.

Keyed to the shaft 21, adjacent the pawls, on each end of the shaft are plates 24 that carry knock-off pins to throw the pawls out of engagement with the pinions. On the shaft is an arm 26 to which is pivoted the rod 27 that extends down to a point adjacent the elbow 16 in the swing arm. It is there connected to a bell-crank 28 pivoted at 29 in the arm 10. The operating handle 30 is mounted in the bell-crank and when the operator pulls the handle toward him in order to pass the saw over the work, the initial movement of the handle will raise the rod 27 and throw the pawls out of mesh by the mechanism just described.

Should the saw become broken or any accident occur, the first thing the operator would do would be to stop pulling on the handle which would at once result in permitting the pawls to come into engagement. If the operator should let go of the handle and permit the arm to swing back of itself, the pawls would come into mesh to stop the arm from surging forward and hold it stationary as soon as it reached its normal position. It can be seen that this device is a great factor of safety because it prevents the saw from swinging back and forth like a pendulum and this eliminates the chance of the operator being struck by the saw blade.

The saw or other form of blade is operated by means of belt 31 passing over pulley 32 in shaft 33, which mounts the saw blade. The belt 31 is actuated by means of motor 15 in the usual manner.

It is readily to be observed that the device now described is exceedingly compact and strong and that it can be mounted on the side wall or ceiling of a factory or suitable uprights with little or no difficulty. The operation of the device, except with regard to the details above noted is the same on any swing saw and accordingly no general statement of operation other than what has been said is believed to be necessary.

The failure to mention equivalent structures to the structural details on my invention has not been intended to eliminate the application of the doctrine of equivalents in the construction of my claims that follow. In using the word "saw" in the claims I desire to cover any cutting device having a rotary blade.

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

1. In a swing saw, the combination of a wall bracket, a shaft supported thereby, a swing arm and a motor rigidly mounted on said shaft having a driving belt for a device on the arm with the mounting means for the motor adapted to receive it slidably, whereby, the motor may be adjusted in position to act as a counterbalance for the arm and belt tightening means.

2. In a swing saw, the combination of a swing arm, a rock shaft to which said arm is secured, and a motor mounting member mounted on the shaft in fixed relation to the swing arm, said member being set at an angle to the vertical, and adapted to slidably receive a motor, whereby the motor may be adjusted in position to act as a counterbalance for the arm.

3. In a swing saw, the combination of a swing arm, a rock shaft to which said arm is secured, and a motor mounting member mounted on said shaft in fixed relation to the arm, said member being adapted to slidably receive the motor, whereby the motor may be adjusted in position to act as a counterbalance for the arm.

4. In a swing saw, the combination of a shaft, a swing arm on the shaft, a motor also on the shaft, rotatable supporting members having means for mounting them on the desired support, said shaft being mounted eccentrically of said rotatable supporting members, and means for rotating said supporting members to adjust the vertical position of said swing arm and motor.

5. The combination with a pivotally supported arm for a swing saw, of a motor mounting means connected to the said swing arm, said motor mounting means set at an angle to the vertical, and provided with means for retaining a motor at a plurality of positions, whereby the distance of the motor from the pivotal center of the swing arm may be adjusted for the purpose described.

6. The combination of a pair of wall brackets, rotatable plates mounted in said wall brackets, means for rotating said plates, a shaft mounted eccentrically in said plates, a swing arm for a swing saw rigidly mounted on said shaft, and a motor mount-

ing means for a driving motor, also mounted rigidly on said shaft, as and for the purpose described.

7. In a swing saw, the combination with a supporting means for a swing arm, of a swing arm pivotally mounted thereon, a blade on said arm, said arm being formed with an elbow intermediate its ends, with the point of the elbow directed toward the operator of the device, for the purpose described.

8. A new and useful swing arm for swing saws comprising a portion for mounting on a support, a portion whereon a blade is mounted, and an elbow formed intermediate said portions, and positioned and directed so as to be interposed between the blade mounting portion and the operator of the device.

9. In a swing saw, a supporting means for a swing arm, a swing arm pivotally mounted thereon, and depending vertically therefrom, said arm having a bend therein adjacent its lower end, arranged to direct the lower end away from the operator of the device, and a saw mounted on said lower end.

10. The combination with a swing arm, and saw, of means for pivotally mounting said arm, whereby the saw may be moved across the desired piece of work, and a safety lock for said arm, adapted to prevent its movement toward the operator except upon continuous maintaining open of said lock.

11. In a swing saw, the combination with a swing arm pivotally mounted so as to swing over the desired work, of an operating handle for the operator whereby to swing said arm, and a lock for said arm, adapted to prevent its movement toward the operator except upon positive pulling on the said operating handle.

12. In a swing saw, the combination with a swing arm pivotally mounted so as to swing over the desired work, of an operating handle for the operator whereby to swing said arm, a pawl and ratchet device for preventing movement of the swing arm, toward the operator thereof, said pawl and ratchet device having a knock-off element operatively connected to the operating handle, whereby the drawing of the handle toward the operator will release the pawls.

13. The combination with a swing arm pivotally mounted so as to swing over the desired work, a saw thereon, an operating handle for the arm, a locking device for the arm to prevent its movement toward the operator, said operating handle being connected to the said locking device, said connection adapted to enforce a preliminary release of the lock upon actuation of the operating handle in drawing the arm over the work.

14. The combination with a swing arm pivotally mounted so as to swing over the desired work, a saw thereon, an operating handle for the arm, a locking device for the arm to prevent its movement toward the operator, said operating handle being connected to the said locking device, said connection adapted to enforce a preliminary release of the lock upon actuation of the operating handle in drawing the arm over the work, and to initially lock the arm against further movement toward the operator upon release of the handle.

15. The combination with a swing arm for a swing saw pivotally mounted on a suitable support, said arm having an elbow at the lower end thereof, of an operating handle pivotally mounted on said arm beyond the elbow, a pawl and ratchet device for preventing movement of the arm toward the operator, said device having a knock-off element, with the said handle connected beyond its pivot to said knock-off element, as and for the purpose described.

HENRY KAETKER.