O. E. LOOMIS.

INTERMITTENT GRIP DEVICE.

APPLICATION FILED FEB. 6, 1914.

1,136,821.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

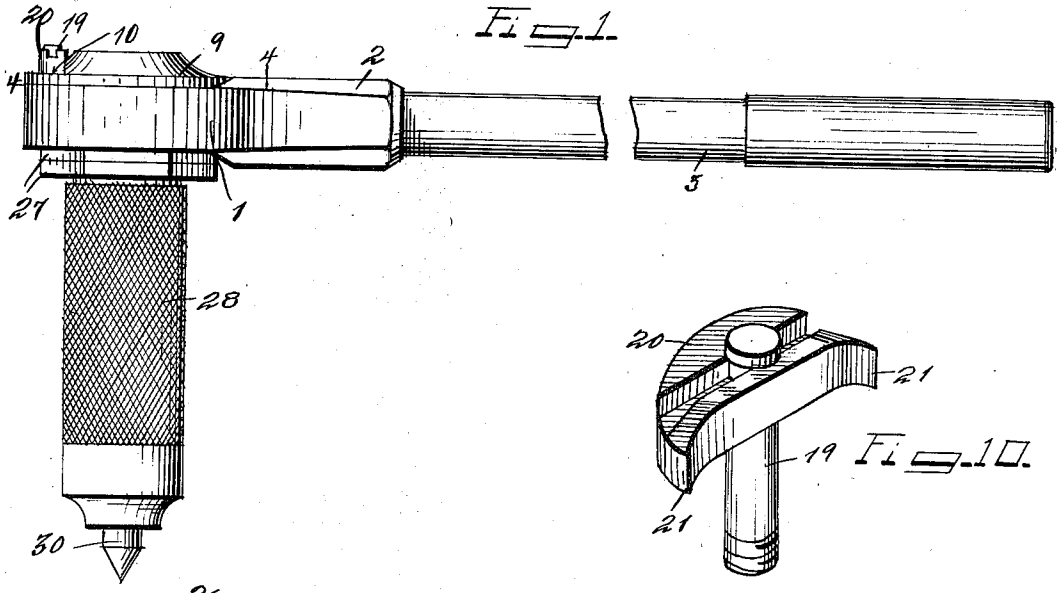


Fig. 10.

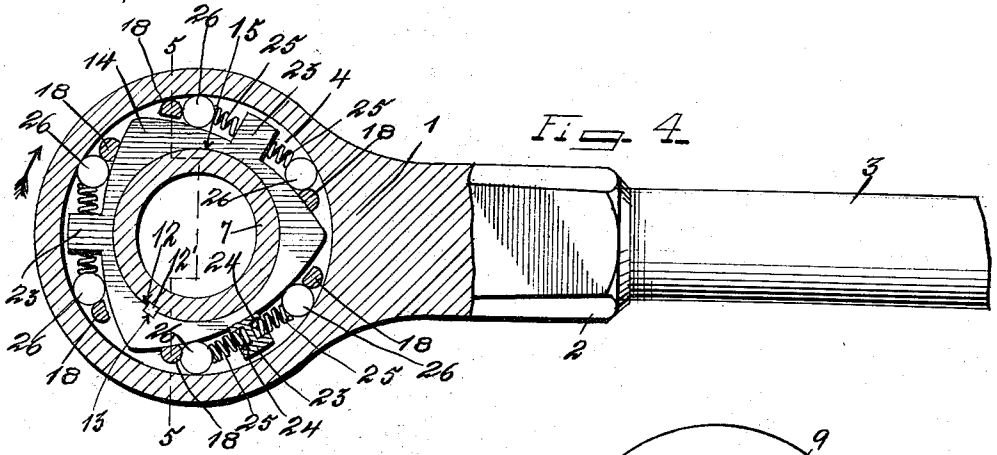


Fig. 4.

Fig. 5.

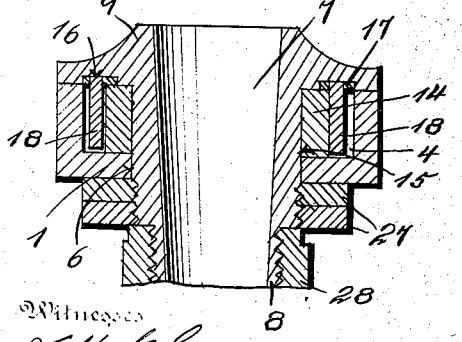
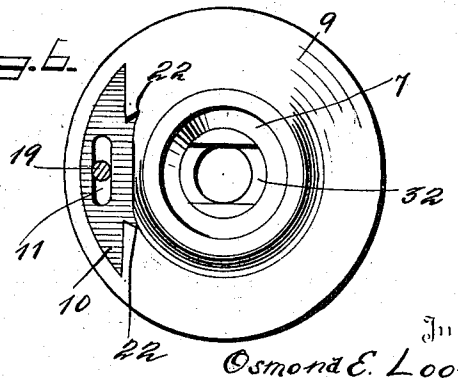


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 2.

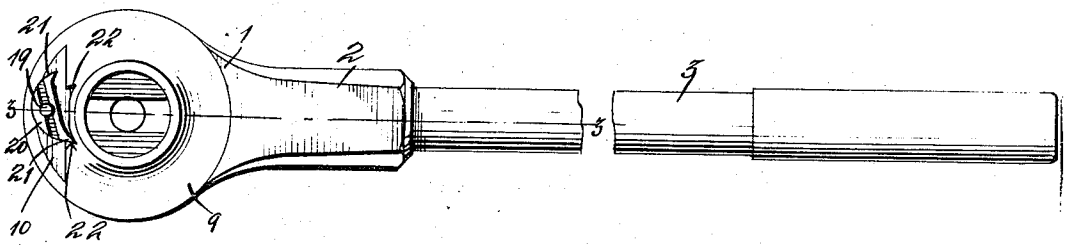

Fig. 3.

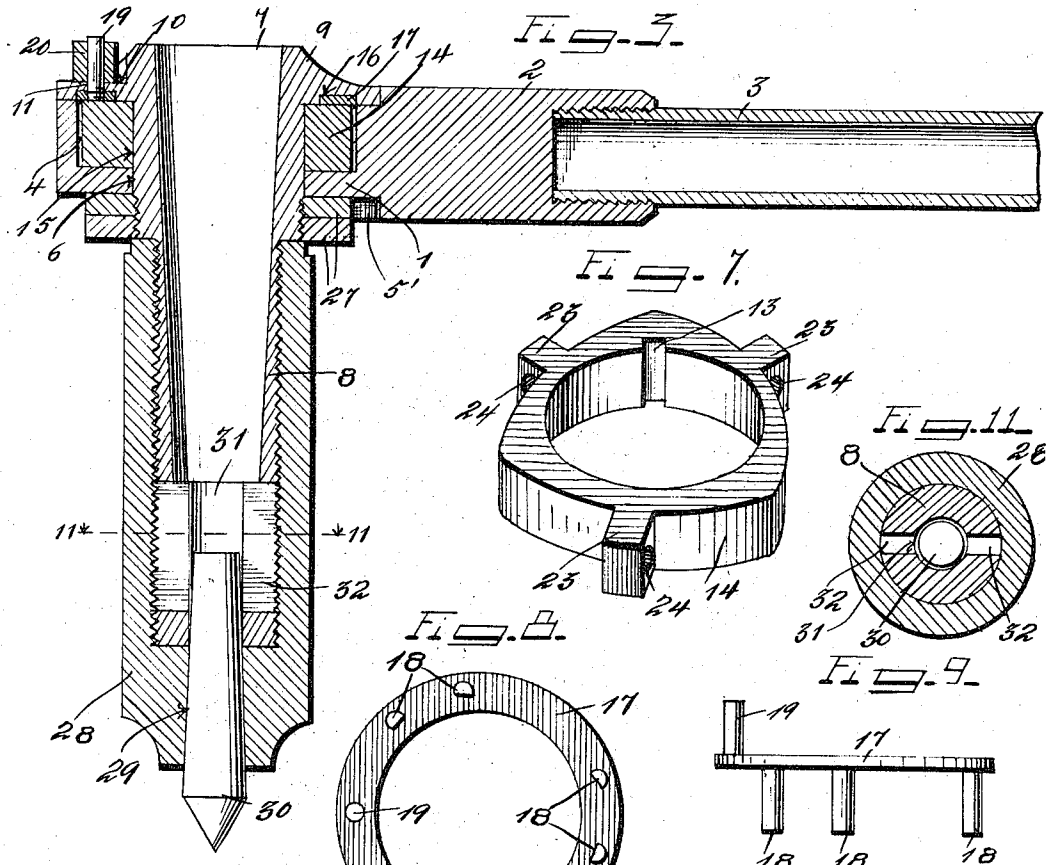

Fig. 7.

Fig. 11.

Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE.

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INTERMITTENT-GRIP DEVICE.

1,136,821. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed February 6, 1914. Serial No. 816,978.

To all whom it may concern:

Be it known that I, OSMOND E. LOOMIS, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Intermittent-Grip Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an intermittent grip device and has for its principal object the production of a device which is provided with simple and efficient means for allowing the same to be turned and operated in either direction.

Another object of this invention is the production of an intermittent grip device having a shifting plate which is adapted to shift the locking mechanism carried within the interior of the device for causing the same to operate in a desired direction.

With these and other objects this invention consists of certain novel combinations, constructions and arrangements of parts as will be hereinafter fully described and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of the intermittent grip device constructed in accordance with this invention and showing a stock carried thereby. Fig. 2 is a top plan view of the device. Fig. 3 is a section taken on the line 3—3 of Fig. 2. Fig. 4 is a section taken on the line 4—4 of Fig. 1. Fig. 5 is a section taken on the line 5—5 of Fig. 4. Fig. 6 is a top plan view of a certain head used in connection with this device. Fig. 7 is a detailed perspective view of the locking cam. Fig. 8 is a bottom plan view of the shifting plate. Fig. 9 is a side elevation of the locking plate showing the locking pins carried thereby. Fig. 10 is a detailed perspective view of the trigger member used for operating the shifting plate. Fig. 11 is a transverse section taken on the line 11—11 of Fig. 3 looking in direction of the arrows.

Referring to the accompanying drawings by numerals 1 designates the body of the intermittent grip device which is provided with a reduced hollow portion 2 adapted to carry the handle 3. This body 1 is provided with a comparatively deep rounded pocket 4 which communicates with the socket 5′ by means of the enlarged opening 6. A hollow sleeve 7 provided with the reduced threaded end 8 passes through the opening 6 formed in the body 1. This sleeve 7 is provided at one end with an enlarged head 9 having a notched portion 10 and an elongated slot 11, this elongated slot 11 passing through the head 9. In order to rotate this sleeve 7 in a desired direction, it is provided with a groove 12 which communicates with the groove 13 formed in the locking cam 14. These grooves 12 and 13 are adapted to carry the squared key 12′ for holding the locking cam 14 in fixed engagement with the sleeve 7 thereby preventing the cam 14 from having an independent rotation relative to the sleeve 7. This cam 14 is substantially triangular in shape and is provided with a central opening 15 for the reception of the sleeve 7. Since the cam 14 fits within the pocket 4 it may easily rotate for the purpose of rotating the sleeve 7.

In order to rotate the cam 14 and sleeve 7 in the desired direction by means of the body 1 and the handle 3, the head 9 is provided with the circumferential groove 16 upon its inner face connected with the interior of the pocket 4. This groove 16 is adapted to receive the circular shifting plate 17 and this plate 17 is provided with a plurality of shifting pins 18. These pins 18 are fixedly secured to the plate 17 in pairs as clearly disclosed in Fig. 8. These pins 18 extend into the pocket 14 of the body 1 while an operating pin 19 is carried so as to extend from the opposite side of the plate 17. This operating pin 19 passes through the slot 11 formed in the head 9 and carries at its outer end the trigger 20 having the beveled lips 21 adapted to fit in one of the beveled notches 22 formed in the head 9 and communicating with the enlarged notch 10. The locking cam 14 is provided at each one of its free sides with an integral lug 23 which is provided with spring receiving pockets 24. Coiled springs 25 are carried within these pockets 24 and bear at their opposite ends upon the roller bearings 26 thereby causing these roller bearings 26 to normally engage the locking pins 18. These roller bearings are loosely mounted within the pocket 4 and, therefore, are adapted to slide upon the inner portion of the shifting plate 17, as well as the interior of the pocket 4 and upon the cam 14. When the head is in the position disclosed in Fig. 1 it will be seen that these roller bearings will be held within the pocket 4 as these bearings rest

at one end upon the portion of the body 1 within the pocket 4.

When this device is to be assembled, the locking cam may be placed over the sleeve 7 so as to engage the head 9 thereof and be locked into engagement therewith by means of the lug 12'. This will cause each one of the three corners of the locking cam to be positioned between a pair of the shifting pins as clearly disclosed in Fig. 5. The springs 25 may then be placed within the pockets 24 of the integral lugs 23 at which time the roller bearings 25 will be placed so as to engage the free ends of the springs 25 and also the locking pins 18. The body 1 may then be placed over the end of the sleeve 7 so as to allow the cam, roller bearings, springs, and pins to be positioned within the pocket 4. The lock nuts 27 are then threaded into engagement with the sleeve 7 adjacent the threaded end 8 so as to efficiently hold the several parts of the device in an assembled position. A stock 28 may then be threaded into engagement with the sleeve 7 by means of the reduced threaded end 8 thereof. This stock 28 may be provided with a central opening 29 for the reception of the pin or drill 30. It will be seen by referring to Fig. 3 that the inner end of this pin or drill 30 extends into the reduced aperture 31 formed in the lower end of the sleeve 7. This portion of the sleeve is provided with alined slots 32. When it is desired to use the device without the stock 28 the stock may be removed at which time a bit or pin may be positioned within the aperture 31, and the device may be operated in the usual manner for rotating the bit or pin. The bit or pin may be easily removed by passing an article through the alined slots 32 whereas the head of the bit or pin may be struck for driving the same from engagement with the sleeve, so as to allow an instrument to be passed therethrough for forcing the pin or bit from engagement therewith.

When this device is in use the interior of the same will assume the position disclosed in Fig. 4. The plate 17 may be shifted to one side by means of the operating pin 19 and trigger 20. One of the beveled portions 21 of the trigger may then be placed in engagement with the head 9 by positioning the beveled portion in one of the beveled notches 22. When this plate 17 is shifted the locking pins 18 will also be moved. As these locking pins 18 are carried in pairs upon the shifting plate, one pin of the pair will bear directly upon the roller bearing 26 which engages the same thereby compressing the coiled spring of the particular roller bearing 26 and, thereby moving the roller bearing toward the lug, thereby allowing the roller bearing to have more room. The other locking pin of the pair, however, will move away from the roller bearing which engages it thereby causing the roller bearing 26 to be moved away from the particular lug 23 by means of the coiled spring engaging the same. This will cause the roller bearing 26 to engage the body 1 within the interior of the pocket 4. When the plate is shifted it will be seen that three of the roller bearings will be moved into binding engagement with the body 1 while three of the roller bearings will be moved from engagement therewith. As the device is shown in Fig. 4 the sleeve 7 and locking cam 14 will be rotated when the head is rotated in the direction of the arrow, or in a clockwise movement. This is caused since the roller bearings carried or positioned upon the right-hand side of their respective lugs 23 are in binding engagement with the body 1 within the pocket 4 and also in a binding engagement with the shifting pin 18 or the locking cam 14. As soon as the handle has been moved as far as possible in one direction it may be moved so as to cause the head to rotate in the counter-clockwise manner which will cause the roller bearings upon the right-hand side of the lugs 23 to be moved toward the lug compressing the springs 25. The roller bearings 26, however, upon the left-hand side of the lugs 23 will not interfere in the movement of the head or cam into binding engagement with the same as the pins 18 upon the left-hand side of the lugs 23 will hold the roller bearings from engagement with the body 1. When so desired, the trigger 20 may be pivoted upon the operating pin 19 at which time the pin 19 may shift the circular shifting plate 17 so as to cause the pins 18 to move the roller bearings 26 upon the right-hand side of the lugs 23 from engagement with the body 1 at which time the pins upon the left-hand side of the lugs 23 will allow the roller bearings upon the left-hand side of the lugs 23 to engage the body 1, thereby allowing the cam 14 and sleeve 7 to be rotated in an opposite direction to that indicated by the arrow in Fig. 4.

From the foregoing description it will be seen that a simple and efficient intermittent grip device has been produced which may operate in either direction and which is provided with a simple means for shifting the operating mechanism which will cause the same to positively operate by a binding engagement with the mechanism. It will also be seen that this binding mechanism will allow the device to operate by the least movement of the handle inasmuch as the roller bearings and shifting mechanism are so formed as to always be in a binding engagement with the locking cam.

What is claimed as new is:—

1. A device of the class described comprising a body having an operating handle, said body provided with an enlarged pocket,

said body also provided with an opening communicating with said pocket, a sleeve passing through said opening in said pocket, said sleeve provided with an enlarged head inclosing said pocket, and fitting over said sleeve, a cam positioned in said pocket, means for holding said sleeve and cam against independent rotation, said cam comprising a substantially triangular body, said cam provided with an integral lug extending from each side thereof, each of said lugs provided with a plurality of spring receiving pockets, coiled springs carried within said pockets and extending therebeyond, a plurality of roller bearings positioned within said pocket and engaging the free ends of said springs, said head provided with a circular groove, a shifting plate positioned within said groove, said plate provided with a plurality of shifting pins extending into said pocket, said pins adapted to engage said roller bearings, said head provided with a longitudinal slot, an operating pin engaging said shifting plate and passing through said slot, a trigger carried by the outer end of said operating pin, said head provided with a plurality of notches adapted to be engaged by said trigger whereby said pin may be shifted for moving said plate at which time said trigger may engage one of said notches for holding said plate in a set position, said pins engaging said roller bearings whereby when said plate is shifted a plurality of roller bearings will be moved from binding engagement with said body, and the remaining roller bearings will be moved into binding engagement with said body and said cam whereby said cam will be rotated as said body is rotated in one direction, and said body adapted to be rotated in the opposite direction without interference from said roller bearings.

2. A device of the class described comprising a body having an operating handle, said body provided with an enlarged pocket, said body also provided with an opening communicating with said body, a sleeve passing through said opening in said pocket, said sleeve provided with an enlarged head inclosing said pocket and fitting over said sleeve, a cam positioned in said pocket, means for holding said sleeve and cam against independent rotation, said cam comprising a substantially triangular body, said cam provided with an integral lug extending from each side thereof, each of said lugs provided with a plurality of spring receiving pockets, coil springs carried within said pockets and extending therebeyond, a plurality of roller bearings positioned within said pocket and engaging the free ends of said springs, said head provided with a circular groove, a shifting plate positioned within said groove, said plate provided with a plurality of shifting pins extending into said pocket, said pins adapted to engage said roller bearings, means for shifting said plate, whereby when said plate is shifting said pins will move so as to allow a plurality of said roller bearings to move in binding engagement with said body and said cam whereby said cam will be rotated as said body is rotated in one direction and said body being adapted to be rotated in the opposite direction without interference from said roller bearing.

3. A device of the class described comprising a body having an operating handle, said body provided with an enlarged pocket, said body also provided with an opening communicating with said pocket, a sleeve passing through said opening in said pocket, said sleeve provided with an enlarged head inclosing said pocket and fitting over said sleeve, a cam positioned within said pocket, means for holding said sleeve and cam against independent rotation, said cam comprising a substantially triangular body having bowed side portions, lugs formed integral upon said cam at spaced distances from the corner portions thereof, roller bearings positioned within said pocket, coil springs engaging said lugs and roller bearings for normally urging said roller bearings away from said lugs, means carried within said pocket for engaging said roller bearings and moving a plurality of the bearings in the desired direction at which time the remaining bearings will move into binding engagement with the outer bowed surfaces of said cam and the inner surface of said body whereby when said body is moved in one direction, said cam and sleeve will also be moved in the same direction, said body being adapted to move in the opposite direction without interference from said roller bearings.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

OSMOND E. LOOMIS.

Witnesses:
E. T. MALORY,
CLARENCE R. FOUST.