W. T. SEARS.

CLAMPING MECHANISM.

APPLICATION FILED SEPT. 4, 1914.

1,185,840

Patented June 6, 1916.

Fig. 2.

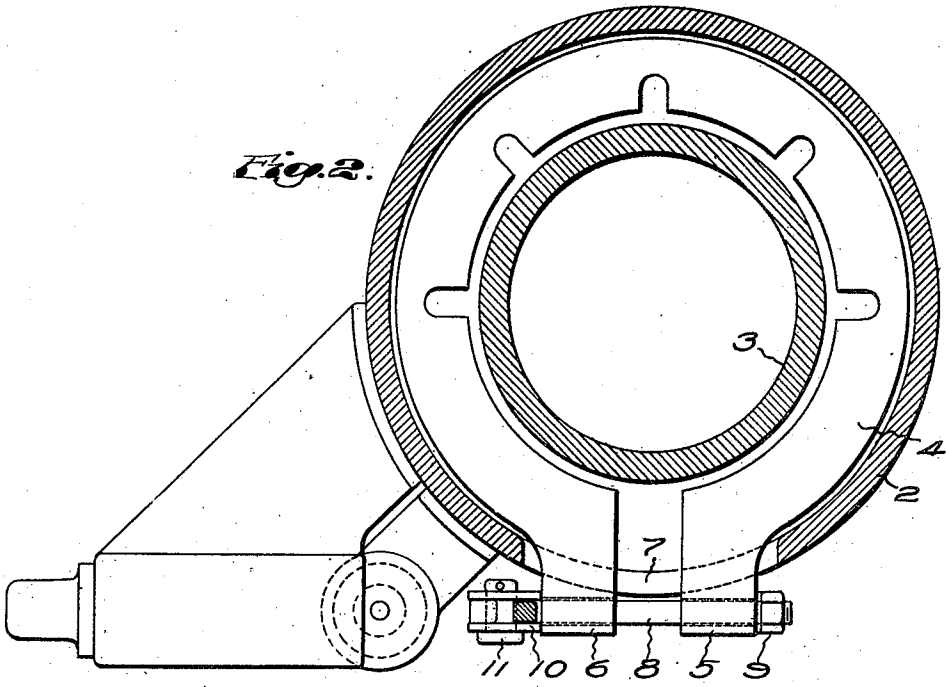
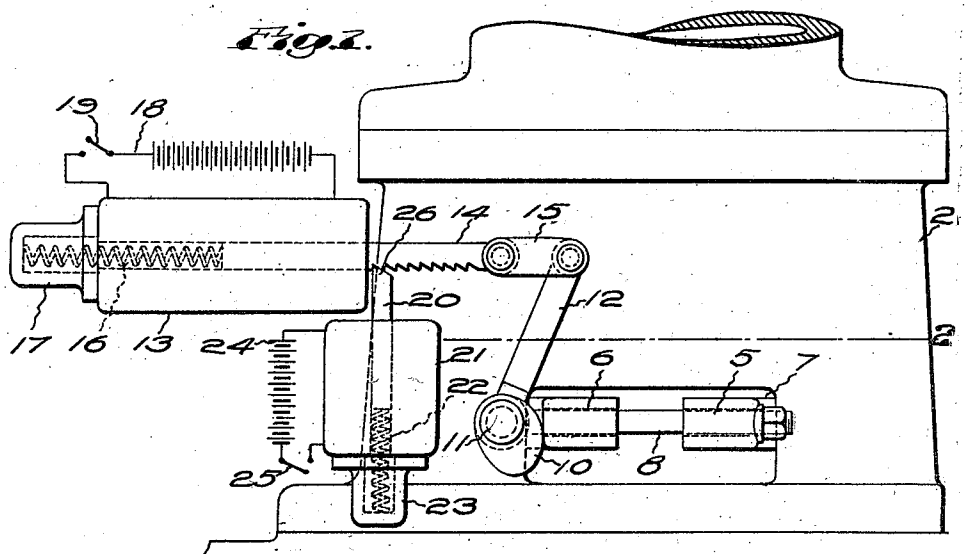


Fig. 1.



Witnesses
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UNITED STATES PATENT OFFICE.

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CLAMPING MECHANISM.

1,185,840. Specification of Letters Patent. Patented June 6, 1916.

Application filed September 4, 1914. Serial No. 860,184.

To a[ll] wh[om] may concern:

Be it known that I, WILLARD T. SEARS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Clamping Mechanism, of which the following is a specification.

This invention relates to clamping mechanism.

The invention covered herein is of the same general type as that set forth in my contemporaneously pending application Serial No. 860,183 filed September 4, 1914, and possesses all the advantages of the organization set forth in said application, but the ends are attained by different mechanism.

In the drawings accompanying and forming part of the present specification I have represented in detail one form of embodiment of the invention, which to enable those skilled in the art to practise the same will be set forth fully in the following description. I do not restrict myself, however, to this disclosure; I may depart therefrom in several respects within the scope of the invention defined by the claims following said description.

Referring to said drawings: Figure 1 is a front elevation of the lower portion of a radial drill equipped with clamping mechanism involving my invention, and, Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Like characters refer to like parts in both views.

As in the application alluded to, the clamping mechanism constituting the subject matter of the present case can be employed with advantage in various connections. In the drawings I have shown the base or bed 2 and the column 3 of a radial drill such, for instance, as shown in Letters Patent No. 1,089,442 granted to me March 10, 1914. This column or upright 3 extends into and is supported for rotary adjustment, by the base or bed 2. When the clamping mechanism is used in conjunction with such a machine, the clamping device of whatever nature the same may be is adapted to hold the column in a rotatively adjusted position.

A clamping device such as meets my conditions is a ring such as that denoted in a general way by 4, located within the hollow base or bed 2, split or divided and surrounding the column. When the ring 4, usually but not necessarily made resilient, is set it grips the column, suitable means hereinafter described being provided to thus cause the constriction of the ring. On releasing said ring it expands or unsets to free the column. I do not restrict myself to the setting of the ring by the operating mechanism hereinafter described, because said operating mechanism can be otherwise utilized as will be inferred, nor is it essential as practically intimated that the clamping device consist of a resilient ring; as a matter of fact it need not be of annular form.

As shown the ring 4 is furnished at its ends with lugs or ears 5 and 6 which project through a slot 7 in the front of the base or bed 2. The two ears have registering perforations to receive the bolt or equivalent connecting member 8 provided at one end with a suitable abutment such as the nut 9 which acts in the present case against the outer surface of the lug 5. These lugs 5 and 6 are caused to approach each other as will hereinafter appear, and when this action occurs the ring 4 will be drawn into clamping relation with the column 3 to hold the latter in a rotatively adjusted position. On outward movement of the ears relatively or otherwise the ring 4 will be unset. The end of the bolt or rod 8 opposite that provided with the abutment or nut 9 is straddled by the companion parallel members of a cam 10 pivoted to said bolt by the pin 11 or otherwise, the active surface of the cam being adapted to operate against the lug 6 and said cam being located at the lower end of the arm 12. Said arm and the cam 10 present a rocker.

In Fig. 2 the ring 4 is assumed to be open or unset, the ears 5 and 6 being separated practically their maximum extent and the cam 10 being in its inoperative position.

By swinging the arm 12 to the left in Fig. 1, the active surface of said cam will ride along the ear 6 and at the same time the bolt 8 will be drawn toward the left thus causing the two lugs to approach and the consequent setting of the ring 4. On return movement of the arm 12 to its initial position the unsetting of the ring will be caused. This is one way of operating a clamping device and by operating I mean either setting or unsetting, the arm 12 and cam 10 usually made rigid with each other, for instance by being made in one piece presenting a suitable clamping device operating member. This operating member in turn is actuated in one direction by a suitable electrically operated device as a solenoid. When the solenoid or equivalent is energized to shift the arm 12 and cam 10 it at the same time renders effective means which imparts a return movement to said arm 12. The solenoid 13 presents a suitable means for imparting an advancing movement to the ring operating member, its core 14 being connected by linkage means as 15 with the upper end of the arm 12. Back of the core 14 I have shown the coiled spring 16 inclosed in part by the solenoid and by the cap 17 connected therewith. The solenoid 13 is included in the circuit 18 having the controlling switch or push button 19.

As already noted the parts are in their primary positions in both views, the solenoid 13 at this time being deënergized. On the closing of the circuit 18 by the operation of the switch 19, said solenoid attracts or draws in its core 14, thus through the linkage means 15 swinging over the arm 12 to effect through the means already described the setting of the clamping device or ring 3. On the movement of the core into the solenoid, said core acting against the spring, compresses the latter so that on reaction of the spring when the solenoid is deenergized and provided also the core 14 be released, said spring can return the solenoid core 14 to its primary or normal position and thereby through the described means or otherwise to cause unsetting of the clamping device of whatever type it may be. The core of the solenoid or some other shiftable part of an equivalent member therefore when it effects one action at the same time renders effective another instrumentality such as a spring for performing a function. It is not essential that the core 14 or equivalent movable member render effective a spring, because analogous means might be utilized therefor. The solenoid core or similar element therefore shifts the arm 12 or performs a similar function and at the same time renders effective means which imparts a reverse movement to said arm, and I prefer to prevent temporarily operative movement of this reversing or returning means of whatever nature the same may be. In the organization shown this effect is accomplished by a latch which holds the core 14 shifted and therefore the spring 16 under compression, and a latch as 20 meets the desired conditions. This latch 20 is the core of the solenoid 21 and is backed up by the spring 22 inclosed by the solenoid 21 and the cap 23 connected therewith. The solenoid 21 is in a circuit of its own such as 24 controlled by the switch or push button 25. The operative or active end of the latch-core 20 is beveled to cooperate with the teeth 26 on the core 14, the spring 22 holding the active end of the latch 20 at all times against the toothed portion 26 of the core 14. As the core 14 is drawn into the solenoid 13 on the energization of the latter in the manner already set forth, the beveled end of the latch-core 20 rides idly along the beveled surfaces of the teeth 26, but when the core 14 is fully in the solenoid 13 the latch-core 20 by engaging the final tooth 26 will hold the core 14 in its shifted position, notwithstanding the fact that the solenoid 13 may be deenergized by the opening of the circuit 18. On the energization of the solenoid 21 by the operation of the switch 25 thus closing the circuit 24, the solenoid 21 attracts or trips the latch or core 21, thus releasing the core 14 so that the latter can be returned to its original position by the power of the compressed spring 16 to effect in the manner described, the unsetting of the clamping device 4.

When I speak of a clamping device I do not use the designation in a restricted but in a broad sense. It is evident that it is not essential that this clamping device should grip an object whether it be a column or not, the elemental consideration being that the clamping device when in operative relation should check or make hard the movement of a movable part, the clamping device therefore being in the nature of a checking or movement-retarding element.

What I claim is:

1. The combination of a base, a column extending into and rotatively supported by the base, a divided clamping member surrounding the column, in the base and provided at its ends with lugs, the base having a slot through which the lugs extend, a bolt extending freely through the lugs and provided with an abutment to engage the outer side of one lug, a cam carried by the bolt to engage the outer side of the other lug, and electrically operated means for causing the cam to constrict the clamping member.

2. The combination of a base, a column rotatively supported by said base, a clamp-

ing member supported by the base for engaging the column, a solenoid, an operating member for the clamping member operatively connected with the core of the solenoid, said core having rack teeth, a spring compressible by the core when attracted by the solenoid, and a second solenoid, the core of which is adapted to engage the teeth of the first solenoid when the latter is attracted.

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

WILLARD T. SEARS.

Witnesses:
DAVID T. NEVIN,
FRANK L. HELLINGS.