No. 822,714. PATENTED JUNE 5, 1906.

J. P. BARTHOLOMEW.

RATCHET MECHANISM FOR TOOLS.

APPLICATION FILED FEB. 24, 1905.

Fig. 1.

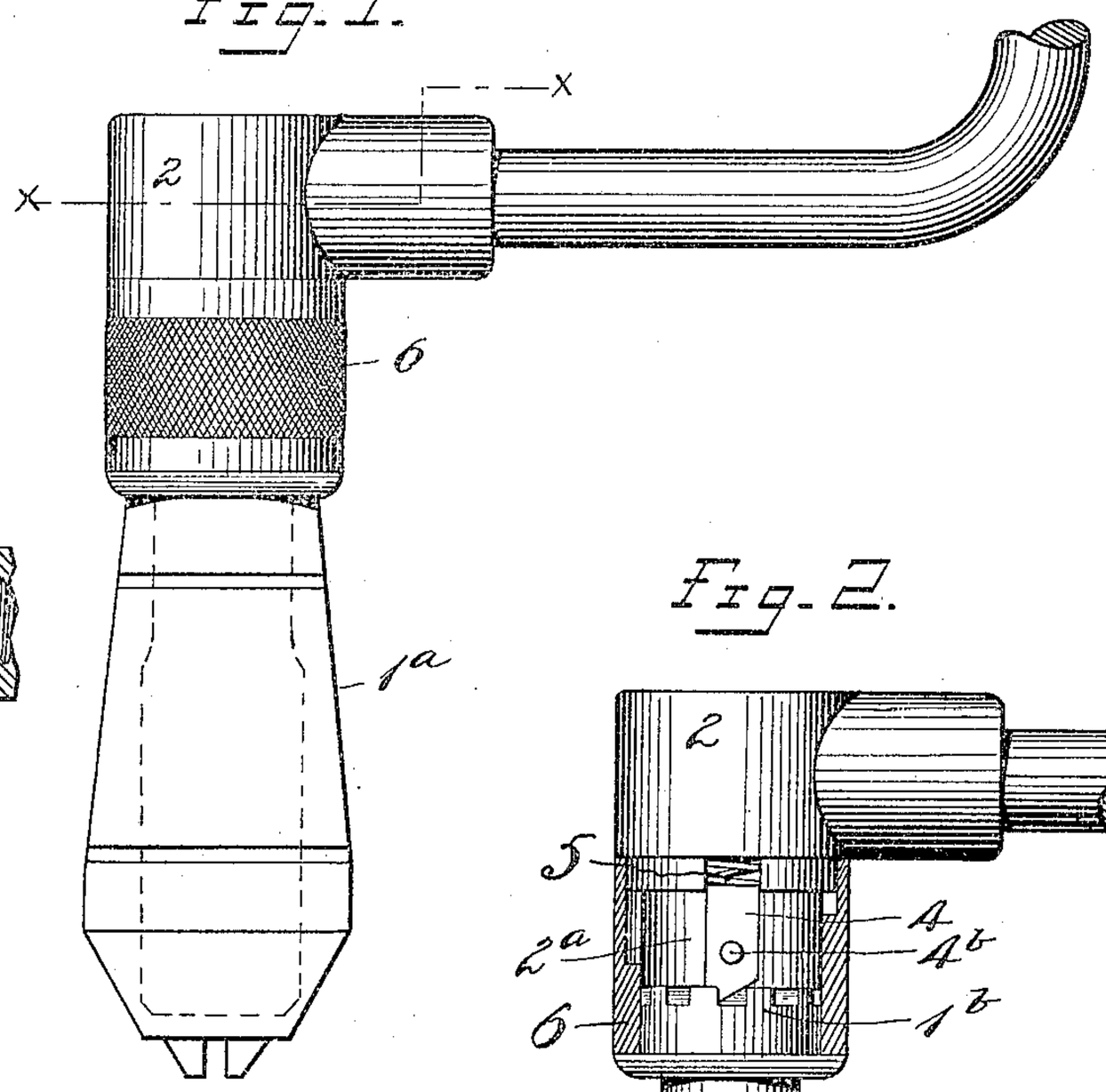


Fig. 4.

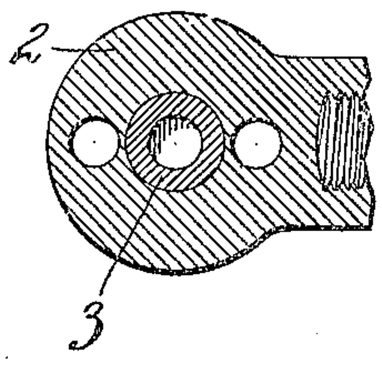


Fig. 2.

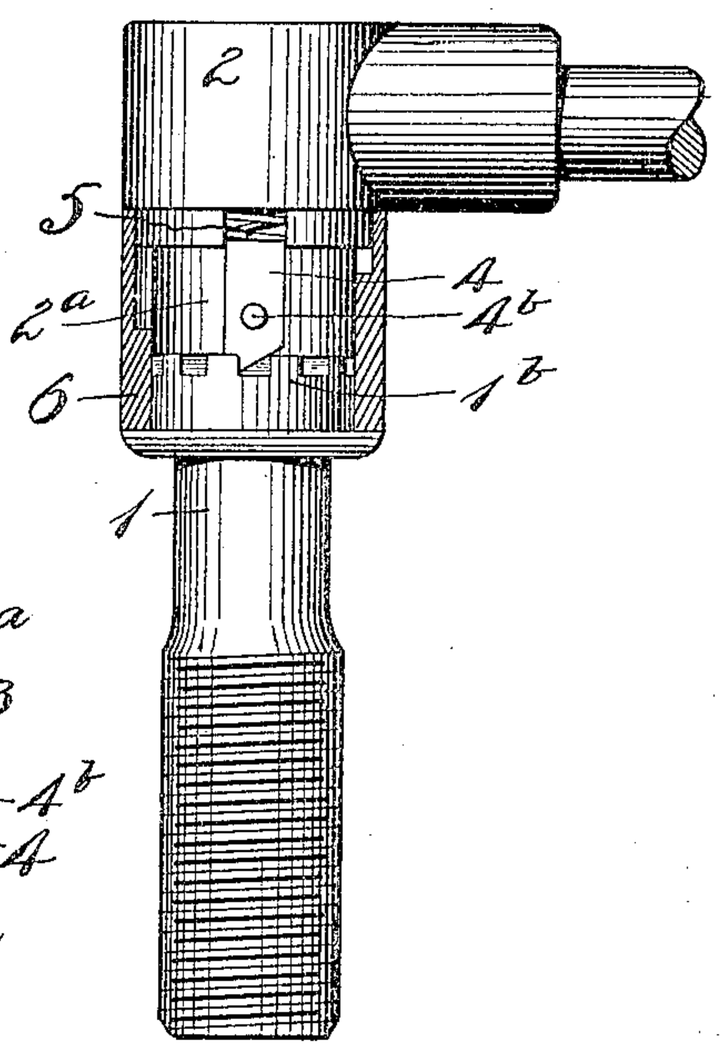


Fig. 3.

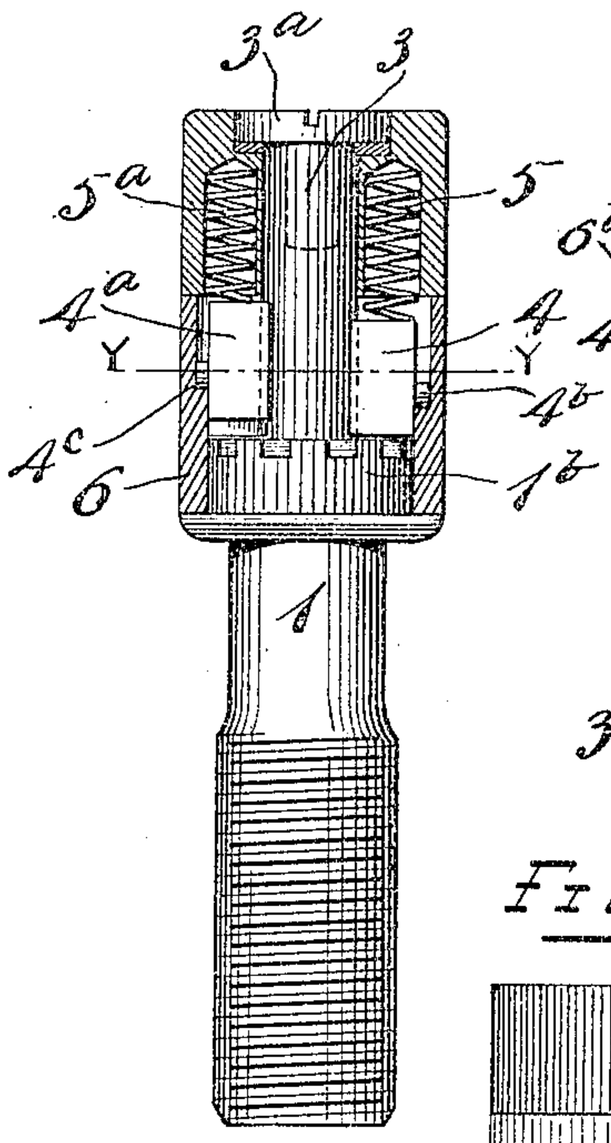


Fig. 5.

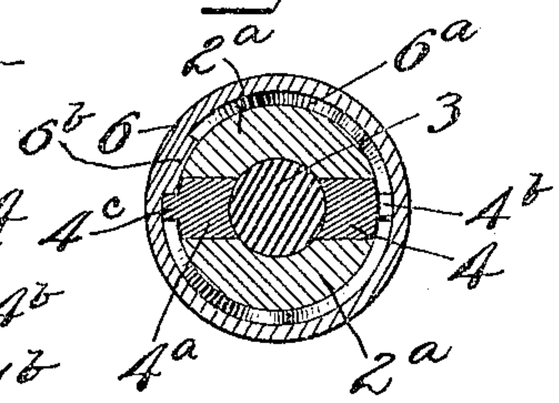


Fig. 6.

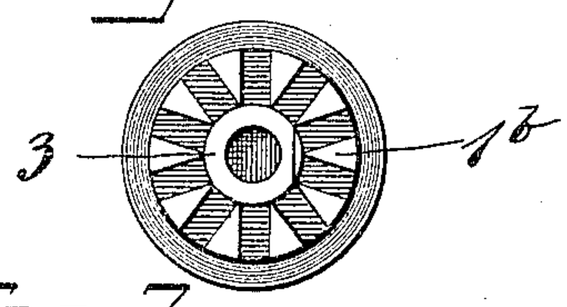


Fig. 8.

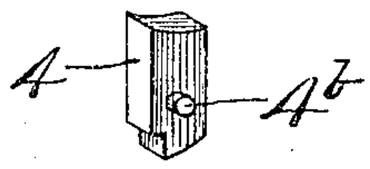
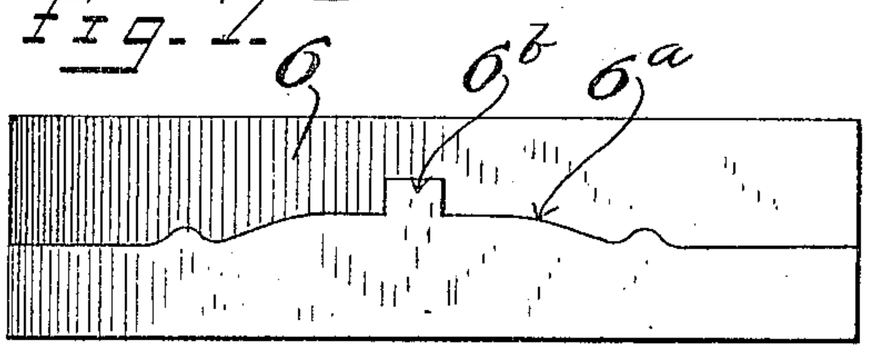


Fig. 7.



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RATCHET MECHANISM FOR TOOLS.

No. 822,714. Specification of Letters Patent. Patented June 5, 1906.

Application filed February 24, 1905. Serial No. 247,206.

To all whom it may concern:

Be it known that I, JOSEPH PECK BARTHOLOMEW, a citizen of the United States, residing at Bristol, Hartford county, Connecticut, have invented certain new and useful Improvements in Ratchet Mechanism for Tools, of which the following is a full, clear, and exact description.

My invention relates to improvements in ratchet mechanisms for tools—for example, bit-braces.

It comprises a driving part and a driven part so connected thereto that it will be interlocked therewith when the former is turned in either direction or whereby it will be interlocked with the driving part only when the latter is turned in one direction.

It is the object of the invention to provide simple, strong, and effective mechanism for interlocking said parts, the said mechanism being controllable by a readily-accessible means.

In the accompanying drawings, Figure 1 is a side elevation of my invention as applied to a bit-brace, a portion of the latter being shown. Fig. 2 is a similar view, one of the parts being shown in section to reveal the internal construction. Fig. 3 is a view partly in elevation and partly in section, said section being taken on a vertical plane at right angles to the sectional plane represented in Fig. 2. Fig. 4 is a section on the plane of the line X X, Fig. 1. Fig. 5 is a section on the plane of the line Y Y, Fig. 3. Fig. 6 is a plan view of the driven part detached. Fig. 7 is development of the controlling device and the cam carried thereby. Fig. 8 is a perspective view of the detail of construction.

In the preferred form, which is shown in the drawings, 1 is the driven part, provided with suitable tool-holding apparatus, such as an ordinary chuck 1^a.

2 is the driving part.

3 is a shaft or spindle of less diameter than the diameter of the driven part and constituting a part thereof.

The driving part 2 constitutes a housing or holder for the ratchet mechanism, the same being arranged to rigidly engage or intermittently engage the driven part, as desired and in the manner hereinafter described.

1^b is a crown-ratchet carried by the driven part 1. The teeth of said crown-ratchet are engaged by the ratchet mechanism. The ratchet mechanism shown comprises two pawls 4 4^a, having, respectively, oppositely-faced teeth, beveled on one side. These pawls are carried or held in suitable guideways in the side walls of an annular hub portion 2^a of the driving part 2. The pawl mechanism is operated by suitable spring mechanism—for example, springs 5 5^a, which normally press said pawls 4 4^a toward and into engagement with the crown-ratchet 1^b. When both pawls are in engagement therewith, the driving and the driven part will be interlocked; but when either of said pawls is held out of engagement therewith the driving part is free to be turned in one direction independently of said driven part, whereby an intermittent driving action may be afforded.

6 is the controller, carrying a cam 6^a. (See the development view Fig. 7.) 6^b is a stop projection on said cam, which is preferably provided for the purpose of preventing the cam from being turned beyond a certain predetermined distance in either direction. The cam constitutes a support for the lateral projections 4^b 4^c, carried by the ratchet devices 4 4^a, respectively. These projections extend outside of the hub portion 2^a of the driving member, so as to stand over said cam. When the cam 6^a stands in one position, it will permit the ratchet mechanism to interlock the driving and the driven part, so that they cannot be turned independently; but when turned to a second position one of said ratchets 4 or 4^a will be lifted out of engagement, so that the other ratchet only will operate to engage the parts. Under such conditions the parts will be intermittently clutched. This position of the ratchet mechanism is illustrated, for example, in Fig. 3. If the controlling device is turned to a third position, the cam will permit the ratchet 4^a to descend and will elevate the ratchet 4, whereby the parts will be intermittently locked when the driving part is rotated in an opposite direction.

To hold the parts together, I provide suitable means, such as a screw 3^a, taking into the bearing-spindle 3 of the driven part and overstanding a portion of the driving part. (See Fig. 3.) By causing the spindle to pass through the annular hub of the driving part,

as shown, a long firm bearing or connection between the driving and the driven parts is afforded, whereby twisting and bending strains are resisted most effectively. This feature is one of substantial advantage in tools of this character. In the particular form shown in the drawings the ratchet devices 4 4^a are solid blocks of a thickness corresponding to the thickness of the side wall of the hub 2^a, through which the spindle 3 passes. In this arrangement the spindle itself acts to steady each ratchet 4 4^a at the inner side of each, while the outer side is supported by the pins 4^b 4^c, resting upon the cam 6^a.

The upper end of the crown-ratchet teeth are flattened and smooth, while the lower end of the hub 2^a is also smooth. The thrust of the driving part against the driven part is therefore taken directly by these end surfaces.

By having the controlling-sleeve arranged externally of the driving and driven parts there is no danger of disturbing the adjustment of the said sleeve during the use of the tool.

It should be understood that in this specification I have merely described the preferred form of my invention.

What I claim is—

1. In a ratchet mechanism for tools, a driving part, a driven part, a central spindle carried by the driven part and rotatively connected to the driving part, pawls carried by the driving part and rotatable relatively to the driven part, said spindle supporting said pawls at their inner sides, oppositely-faced teeth on the ends of said pawls arranged to alternately or simultaneously engage the driven part, means for holding said pawls in yielding engagement therewith, and means surrounding the driving part and arranged to move said pawls and to free either of the same from the driven part, whereby power may be applied to rotate said driven part in one direction or the other or to interlock the driving and the driven parts against independent rotation.

2. In a ratchet mechanism for tools, a driving part, a driven part, an annular hub on the driving part, the end of said hub being slotted through transversely, a spindle on the driven part passing through said hub, a ratchet on said driven part, ratchet mechanism including two pawls, mounted in said slotted portion and bearing against said spindle, oppositely-faced teeth respectively carried by said pawls and arranged to engage with said ratchet, a controller comprising an external sleeve, a cam carried thereby, means of engagement between the outer sides of said pawls and said cam whereby either pawl may be held out of operative position or be permitted to assume said operative position.

3. In a ratchet mechanism for tools, a driving part, a driven part, an annular hub on the driving part, the end of said hub being slotted through transversely, a spindle on the driven part passing through said hub, a ratchet on said driven part, ratchet mechanism including two pawls, mounted in the slotted end of the hub, and bearing against said spindle, oppositely-faced teeth respectively carried by said pawls and arranged to engage with said ratchet, a controller comprising an external sleeve, a cam carried thereby, means of engagement between the outer sides of said pawls and said cam whereby either pawl may be held out of operative position or be permitted to assume said operative position, the end of said hub bearing upon the end of said crown-ratchet.

4. In a ratchet mechanism for tools, a driving part, a driven part, an annular hub on the driving part, the end of said hub being slotted through transversely, a spindle on the driven part passing through said hub, a ratchet on said driven part, ratchet mechanism including two pawls bearing against said spindle, oppositely-faced teeth respectively carried by said pawls and arranged to engage with said ratchet, a controller comprising an external sleeve, a cam carried thereby, means of engagement between the outer sides of said pawls and said cam whereby either pawl may be held out of operative position or be permitted to assume said operative position, and a spring mechanism to normally project said pawls toward said ratchet.

5. In a ratchet mechanism for tools, a driving part, a driven part, a hub on the driving part, a spindle rotatably mounted in said hub, a crown-ratchet rigidly carried by and surrounding the spindle at its base and facing the end of the hub, a longitudinal recess in the end of said hub, extending through the wall thereof from the outer to the inner surface, a spring-pressed pawl longitudinally movable in said recess, said pawl being supported along its inner edge by the relatively movable spindle and along its side edges by the walls of said recess, and a pawl-controlling device or sleeve surrounding said hub and overstanding the space occupied by the pawl so as to house the latter therein.

6. In a ratchet mechanism for tools, a driving part, a driven part, a hub on the driving part, a spindle on the driven part passing through said hub and being rotatively connected thereto, recesses in the end of said hub intersecting the outer and the inner wall thereof, longitudinally-movable spring-pressed pawls in the said recesses, one of said pawls having a tooth facing in one direction, another of said pawls having a tooth facing in an opposite direction, said pawls being supported along their inner edges by said relatively movable spindle, a pawl-operating device or sleeve housing the recessed end of said hub and making connection with the outer edges of said pawls, and a crown-ratchet rigid with

the driven part surrounding the spindle and in the path of movement of said pawls.

7. In a ratchet mechanism for tools, a driving part, a driven part, a hub on the driving part, a spindle on the driven part passing through said hub and being rotatably connected thereto, a ratchet rigid with the driven part facing the end of the hub, a pawl-receiving space in the end of the hub, said space intersecting the spindle-passage, a pawl in said space supported at its inner side by the relatively rotatable spindle, means for yieldingly pressing said pawl toward said ratchet, and a controlling device engaging said pawl and arranged to hold the same out of engagement with said ratchet when desired.

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