A. FALKENAU.

RATCHET MECHANISM.

APPLICATION FILED MAR. 16, 1915.

1,150,587.

Patented Aug. 17, 1915.

Fig. 1.

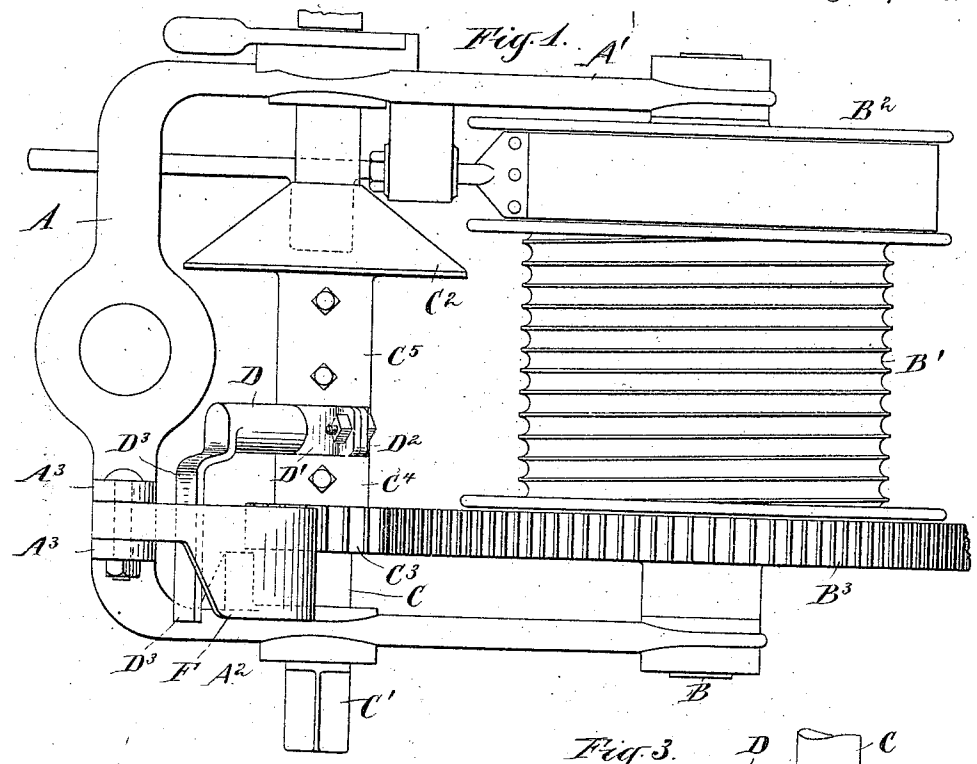


Fig. 2.

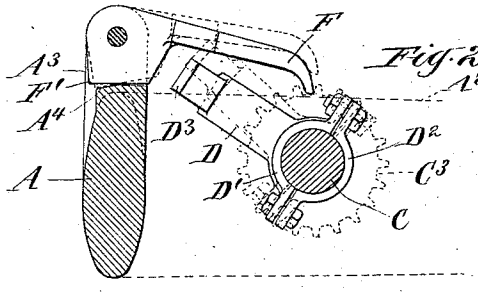
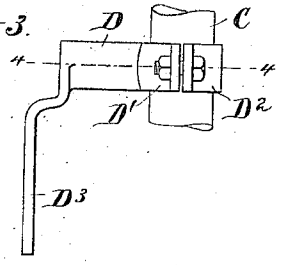


Fig. 3.



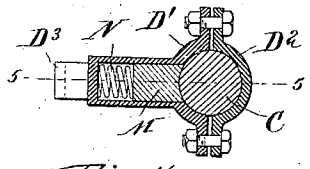


Fig. 4.

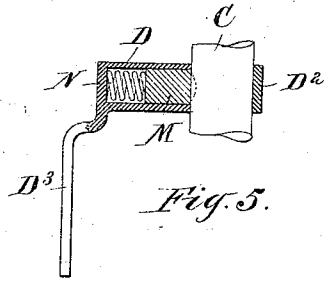


Fig. 5.

Witnesses:
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by his attorney,
Charles K. Search.

UNITED STATES PATENT OFFICE.

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RATCHET MECHANISM.

1,150,587. Specification of Letters Patent. Patented Aug. 17, 1915.

Application filed March 16, 1915. Serial No. 14,800.

To all whom it may concern:

Be it known that I, ARTHUR FALKENAU, a citizen of the United States, residing in the city of New York, borough of Manhattan, in the county and State of New York, have invented a certain new and useful Improvement in Ratchet Mechanism, of which the following is a specification.

The invention relates to ratchet and pawl devices, and the object of the invention is to provide simple, efficient means for avoiding the noise due to the impact of the pawl on the teeth of the ratchet as they pass successively thereunder when the ratchet wheel is turned in one direction, and also for insuring immediate reëngagement of the pawl with such ratchet-wheel or pinion when the latter is turned in the opposite direction.

Another important object is to effect such disengagement and reëngagement automatically and thus avoid danger of accident to the hand of the operator.

The invention consists in certain novel features and details of construction and arrangement by which the above objects are attained, to be hereinafter described and claimed.

In certain classes of machinery, notably in hoisting apparatus designed for the removal of ashes and the like from the cellars of residences, apartment houses, and hotels, the noise due to the action of the pawl is very objectionable; this invention is intended especially for such conditions of service, and will be thus shown and described.

The accompanying drawings form a part of this specification and show the invention as applied to a hoisting apparatus similar to that set forth in U. S. Letters Patent to John A. Kearney, dated May 19, 1914, No. 1,097,233.

Figure 1 is a plan view of the hoisting head equipped with the improved silencer. Fig. 2 is a vertical section through a portion of the head, and partly in elevation. Fig. 3 is a plan view of the silencer alone. Fig. 4 is a corresponding vertical section, the plane of section being indicated by the line 4—4 in Fig. 3. Fig. 5 is a horizontal section of the same, taken on the line 5—5 in Fig. 4.

Similar letters of reference indicate the same parts in all the figures.

A is the frame of a hoisting head having horizontally projecting arms A^1 A^2 in which is mounted a shaft B carrying a winding-drum B^1, brake-drum B^2 and a gearwheel B^3. The latter meshes with a pinion C^3 on a shaft C mounted in the arms A^1 A^2 parallel with the shaft B. The other equipments of the shaft C, as the cone C^2, need not be described in relation to this invention, and will be understood to operate in the manner and for the purposes set forth in the Letters Patent to which reference is made above.

The shaft C is turned by a crank, not shown, applied upon the squared overhung end C^1, and the pinion C^3 also serves as a ratchet wheel.

F is a pawl pivotally mounted between the vertical lugs A^3 A^3 on the frame and is arranged to ride upon the teeth of the pinion C^3 when the shaft C is turned to wind the cable and raise the load, and to fall between two adjacent teeth and hold the load when the turning movement ceases.

The silencer comprises a hollow casing D having a semicircular yoke D^2 at one end adapted to receive a corresponding cap D^2 bolted thereon to encircle loosely the shaft C and maintain the casing in position radially of the shaft. Movement longitudinally of the shaft is prevented by the hub C^4 of the pinion on one side and a fixed sleeve C^5 on the other. At the opposite end of the casing is a finger D^3 extending parallel with the shaft and lying below the pawl F and between the latter and the frame-arm A^2, or other relatively fixed stop.

Within the casing is a cylindrical plug M preferably of wood, loosely inclosed and grooved or hollowed transversely at one end to match the adjacent cylindrical surface of the shaft C, and is held in strong frictional contact therewith by the expansive force of an inclosed helical spring N abutting at one end against the plug and at the other against the closed head of the casing. The friction thus induced is sufficient to cause the casing to revolve with the shaft unless restrained, and when restrained to permit the shaft to turn in rubbing contact with the plug.

When the shaft C is turned in the direction to revolve the winding-drum and raise the load, the friction between the plug and shaft causes the casing to turn with the lat-

ter and forces the upper edge of the finger D^3 into contact with the adjacent under face of the pawl F, thus lifting the pawl clear of the teeth of the pinion, the pawl remaining in this condition held by the finger during the continuation of the hoisting movement, with the shaft C revolving in idle frictional contact with the plug M. The extent to which the pawl may be thus lifted is determined by the contact of a shoulder F^1 on the pawl with a surface A^4 on the frame between the lugs A^3 A^3, or other suitable limiting means which may if preferred be adjustable. The pawl is thus automatically held out of contact with the teeth of the pinion during the hoisting operation and the noise caused by the passage of the teeth thereunder, in the usual ratchet and pawl construction, is eliminated. On turning the shaft C in the opposite direction the casing again moves therewith and the finger D^3 is correspondingly moved downwardly, permitting the pawl to descend by gravity until engaged with a tooth, or until the finger is arrested by the contact of its lower edge with the stop formed by the upper surface of the arm A^2. It will be noted that this reëngagement of the pawl and pinion is immediate for the reason that the arc of revolution of the shaft in thus lowering the pawl is exceedingly small, less than the arc between two teeth of the pinion when the parts are proportioned as shown in the drawings.

Other forms of friction grasping means may be employed, and any suitable fixed stop for the finger may be substituted for the arm A^2 as the location of the pawl and pinion may require in various adaptations of the invention, and other modifications may be made as found necessary or desirable in conditioning the invention for service with various pawl and ratchet devices.

I claim:—

1. A shaft, a toothed wheel mounted thereon to turn therewith, a pawl adapted to engage such teeth, a casing loosely mounted on said shaft and engaged frictionally therewith, a finger on said casing, a stop for limiting the movement of said finger in one direction, said finger located between said stop and pawl and adapted to contact with and raise said pawl clear of said wheel when said wheel and shaft are rotated in one direction, and when rotated in the opposite direction to move toward said stop and permit reëngagement of said pawl and wheel.

2. A shaft, a toothed wheel mounted thereon to turn therewith, a pawl adapted to engage such teeth, a hollow casing loosely connected to said shaft, a friction plug in said casing, a spring in the latter forcing said plug into frictional contact with said shaft, a finger on said casing, extending between said pawl and a fixed stop, said stop serving to limit the movement of said finger in one direction.

3. A shaft, a toothed wheel mounted thereon to turn therewith, a pawl adapted to engage such teeth, a hollow casing loosely connected to said shaft, a friction plug in said casing, a spring in the latter forcing said plug into frictional contact with said shaft, a finger on said casing, extending between said pawl and a fixed stop, said stop serving to limit the movement of said finger in one direction, and means for limiting the disengaging movement of said pawl.

In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses.

ARTHUR FALKENAU.

Witnesses:

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C. M. FREDERICKS.