

No. 607,794.

Patented July 19, 1898.

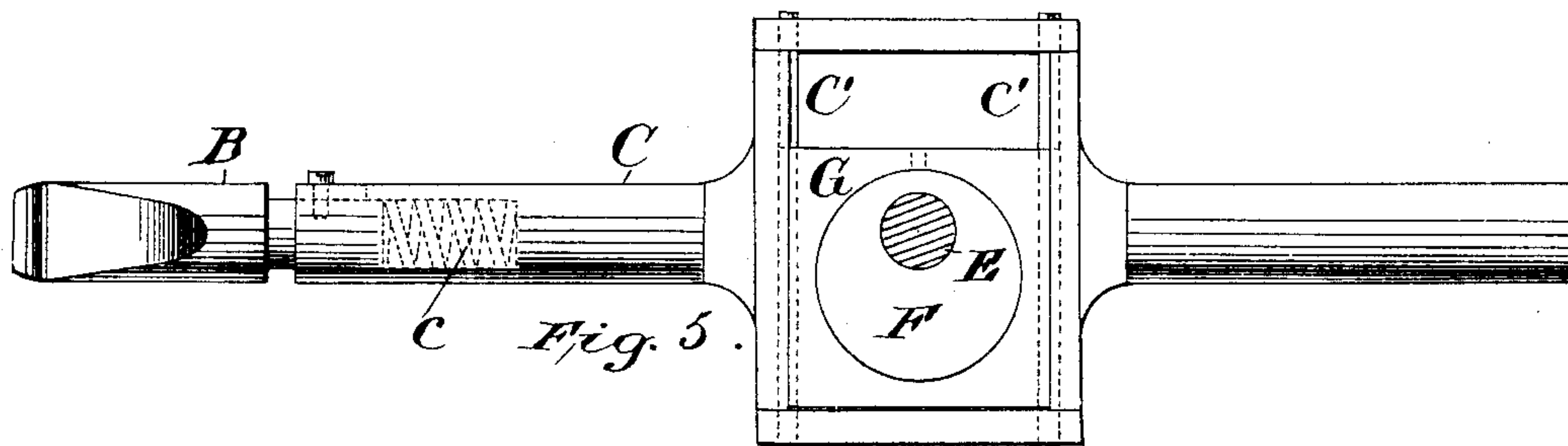
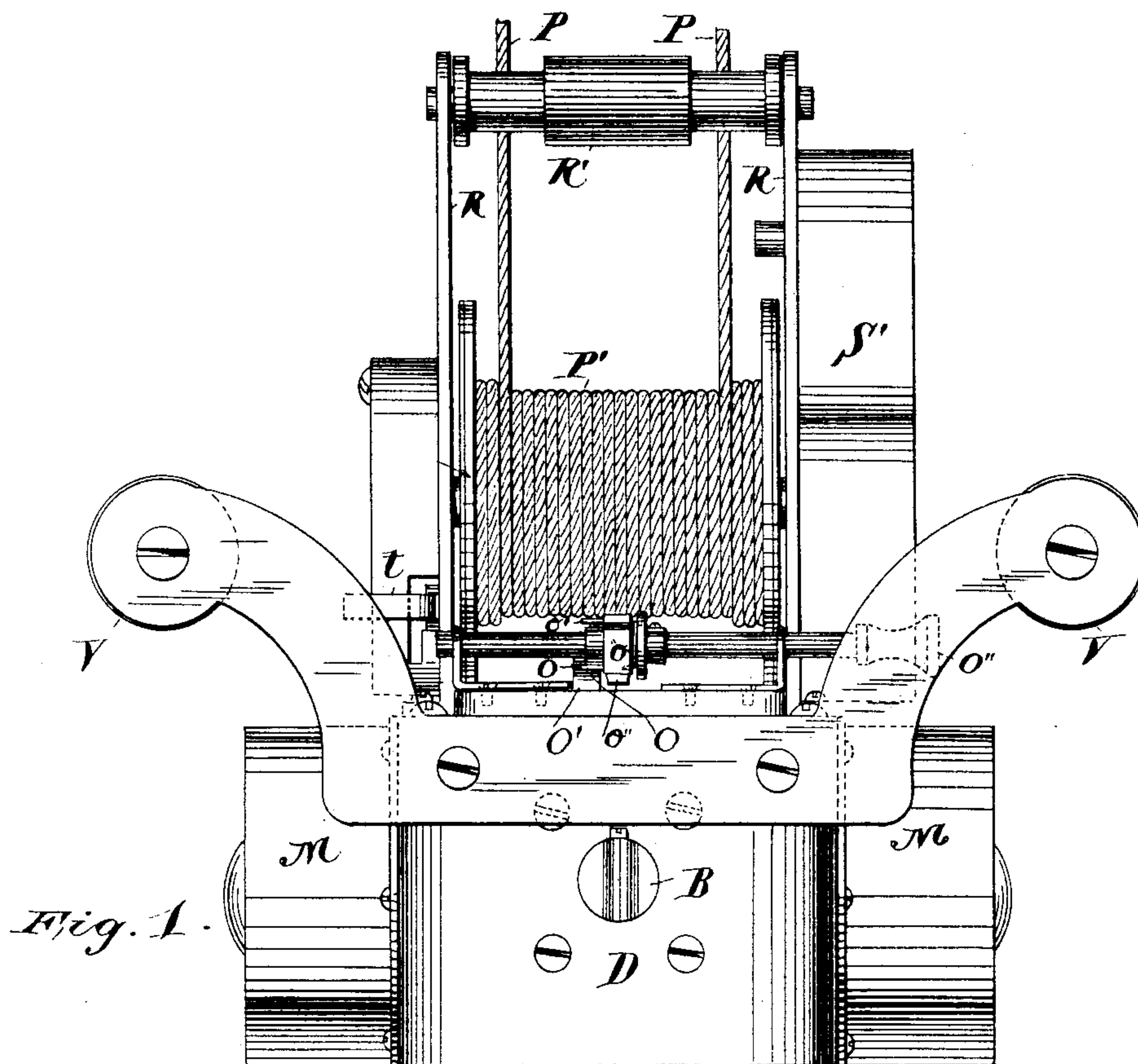
W. P. FREEMAN.

APPARATUS FOR CLEANING PAINT FROM SHIPS.

(Application filed June 22, 1897.)

(No Model.)

4 Sheets—Sheet 1.



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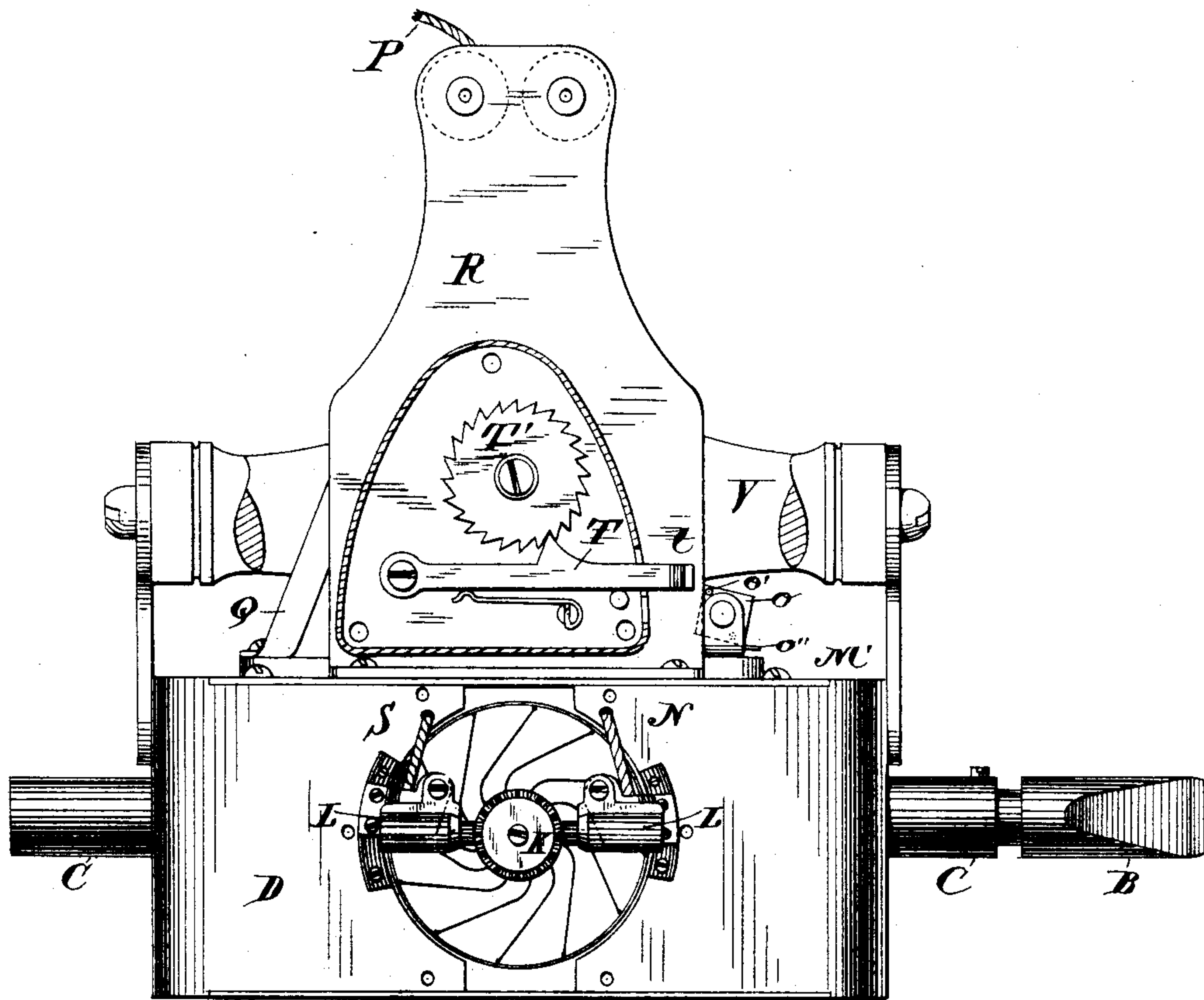


Fig. 2.

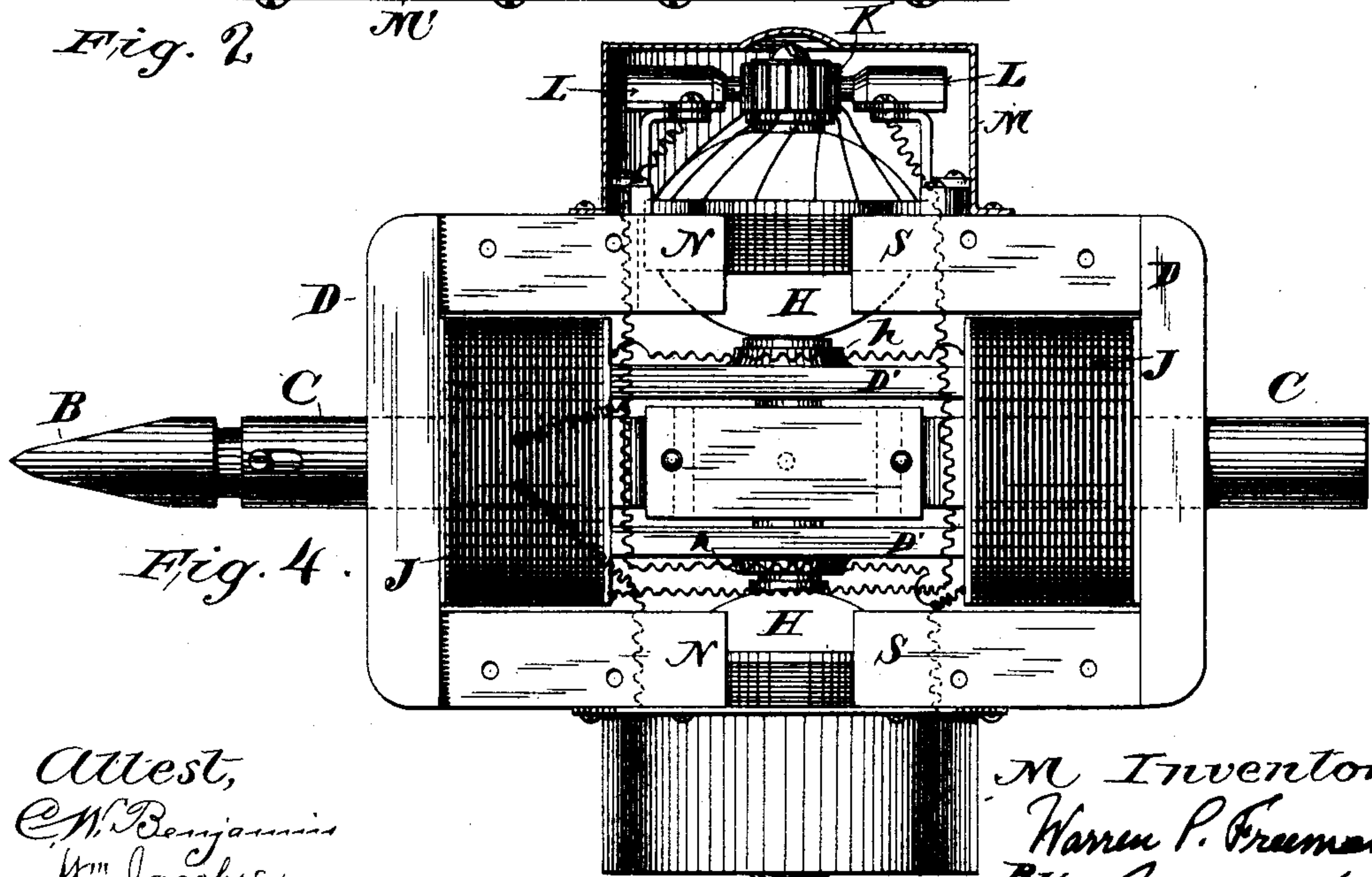


Fig. 4.

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4 Sheets—Sheet 3.

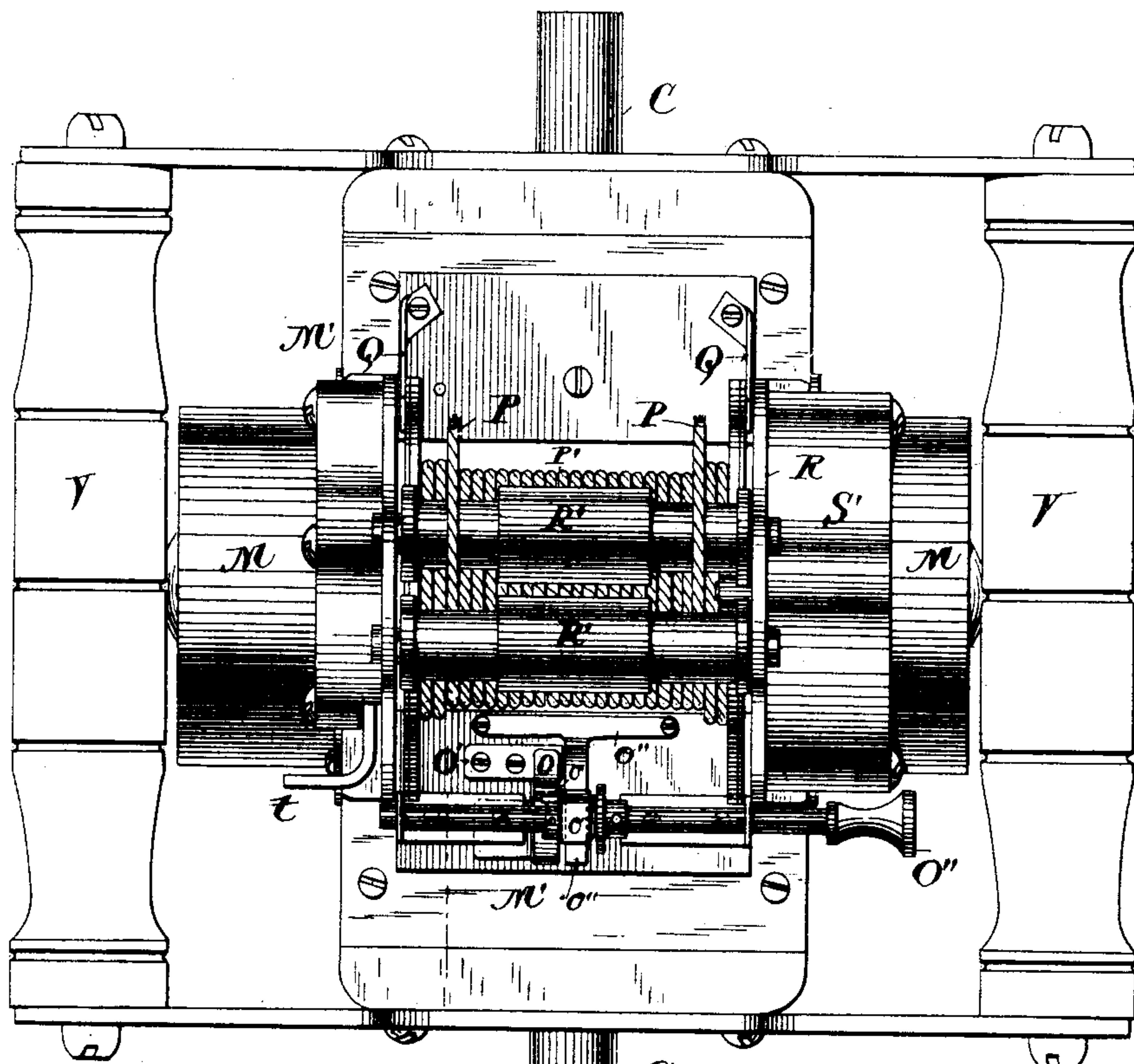


Fig. 3

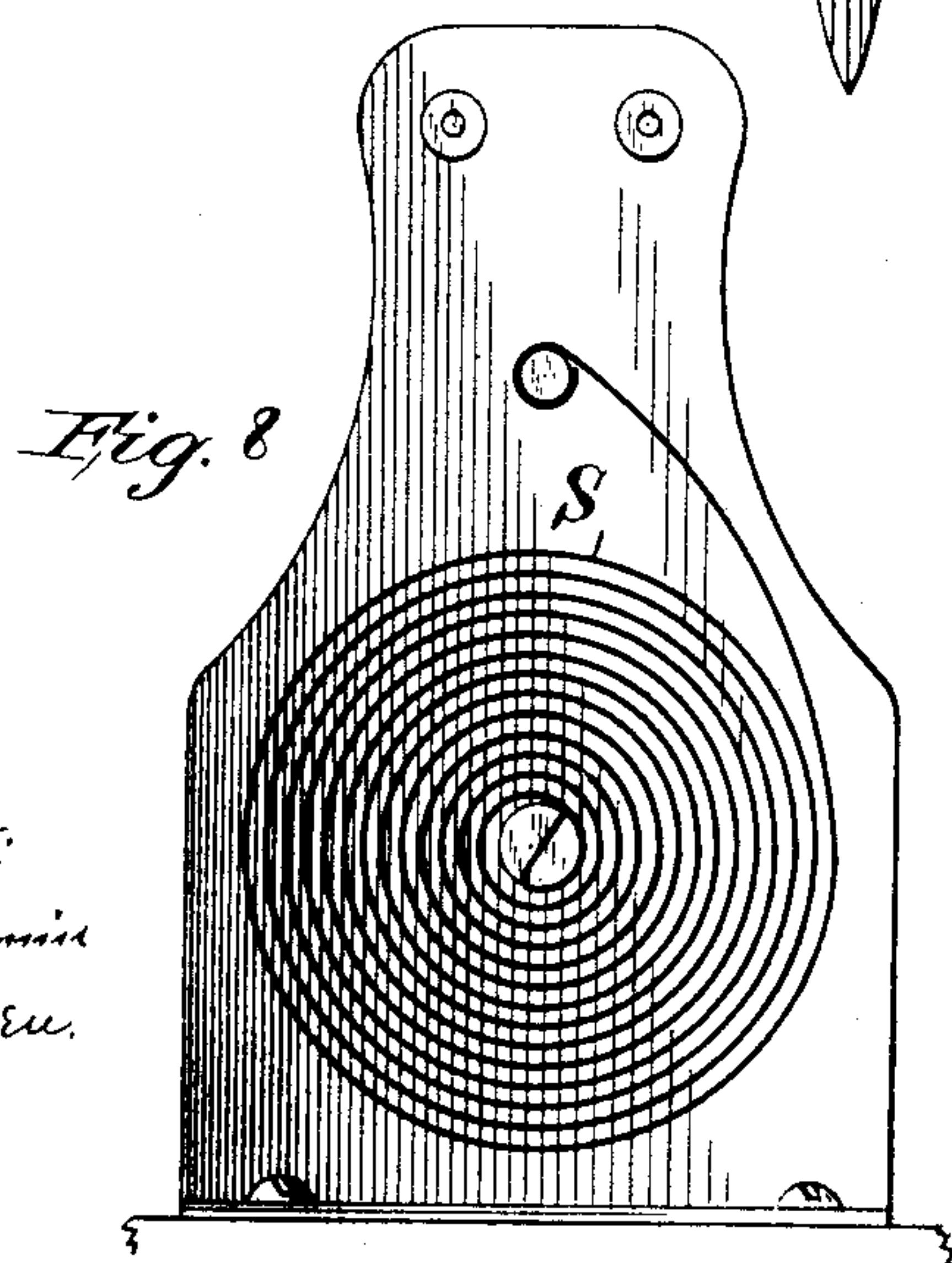
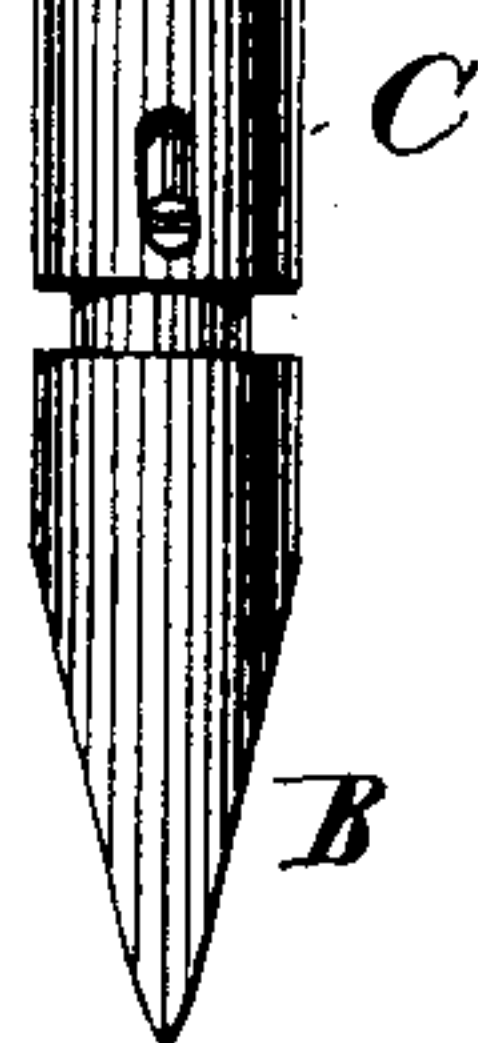


Fig. 8

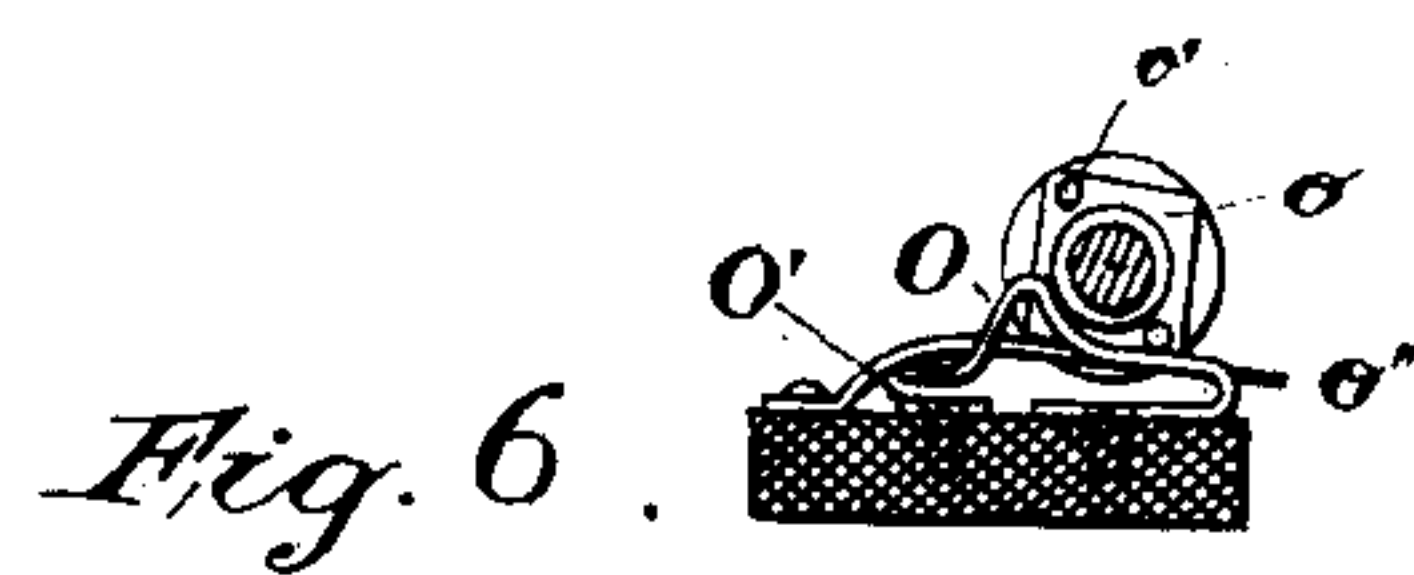


Fig. 6

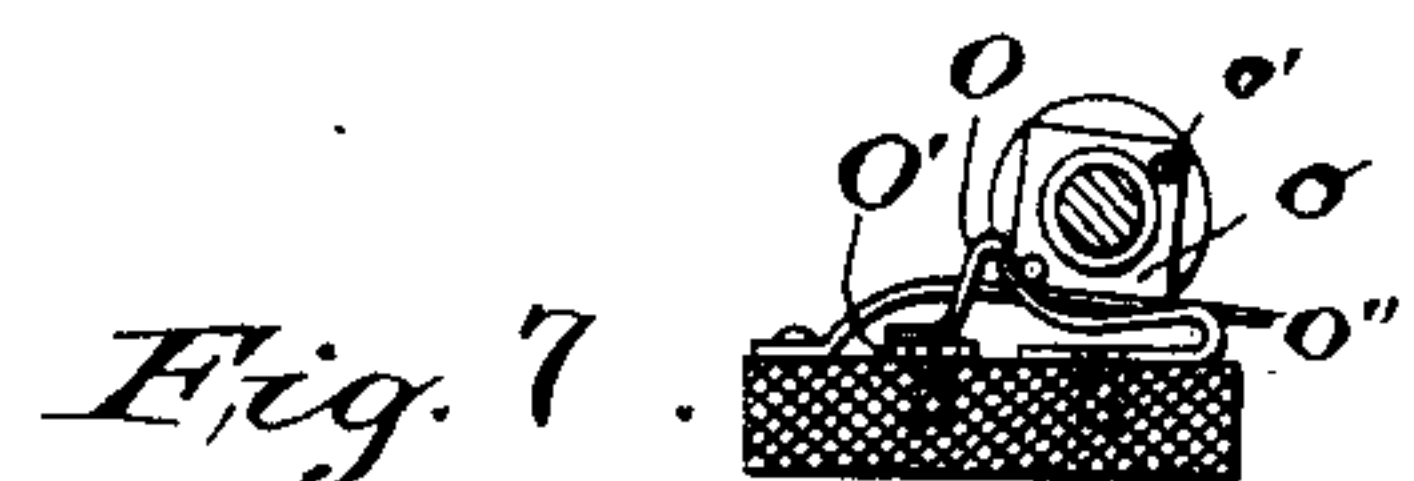


Fig. 7

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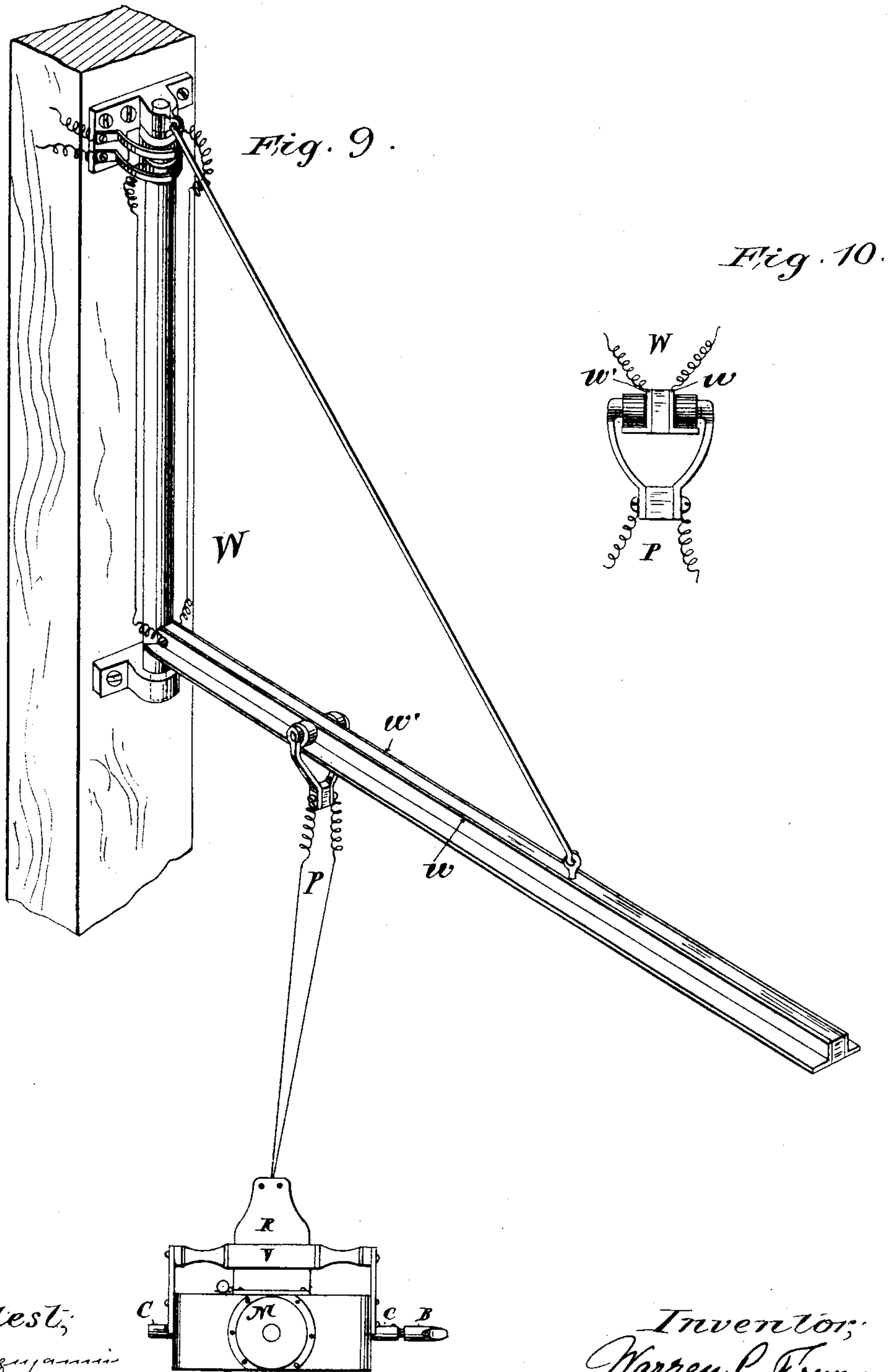
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4 Sheets—Sheet 4.



Attest;
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UNITED STATES PATENT OFFICE.

WARREN P. FREEMAN, OF NEW YORK, N. Y.

APPARATUS FOR CLEANING PAINT FROM SHIPS.

SPECIFICATION forming part of Letters Patent No. 607,794, dated July 19, 1898.

Application filed June 22, 1897. Serial No. 641,806. (No model.)

To all whom it may concern:

Be it known that I, WARREN P. FREEMAN, of the city and State of New York, have invented certain new and useful Improvements in Apparatus for Cleaning Paint from Ships and other Uses, of which the following is a description, referring to the accompanying drawings, which form a part of this specification.

10 The object of the invention is to give to a suitably-supported tool a rapid reciprocating motion, so as to cause the tool to give a succession of blows suitable for cleaning the old paint from the plates of iron ships and suitable also for many other purposes, such as
15 cleaning paint from iron, wood, and stone surfaces, dressing stone, and otherwise treating regular or irregular surfaces by a rapidly-reciprocating tool having a proper edge or working end.

My invention will be fully understood from a description of the accompanying drawings, which illustrate one preferred embodiment of it as arranged for cleaning the paint from
25 ships' plates and for a number of other uses.

In the accompanying drawings, Figure 1 is a front elevation of the instrument itself disconnected from the crane or other apparatus from which it may be suspended. Fig. 2 is a
30 side elevation with the casing for one of the commutators and brushes removed and the casing which covers part of the raising and lowering mechanism shown in section. Fig. 3 is a plan view of the same apparatus. Fig. 4 is a plan view with the raising and lowering mechanism and handles and certain superposed parts removed and one of the commutators exposed by showing its casing in section. Fig. 5 is a detail view of parts of
40 the actuating mechanism for the reciprocating tool-holder, showing the tool also. Figs. 6 and 7 are detail views of one form of electric switch in the open and closed positions, respectively. Fig. 8 is a view of the counter-balance-spring of the raising and lowering mechanism. Fig. 9 shows my complete apparatus in its preferred form and mounting ready for use. Fig. 10 is an end view of the trolley.

50 Throughout the drawings like letters of reference indicate like parts.

For convenience of description I will begin

with the description of the movement and mounting of the tool which cleans or dresses the surface of the ship's plate or other body. 55

In the drawings the tool is shown at B provided with an edge suitable for cleaning off paint or for dressing stone and other surfaces. The tool is mounted in the reciprocating bar or holder C and may be allowed some end play
60 in the holder, the stiff spring *c* being interposed behind the tool. This spring serves to take some of the shock off the electric motor which drives the tool, and in almost all cases I have found the use of such spring advantageous to the working of the tool. The reciprocating bar C extends lengthwise through the supporting iron casing D, as shown in the figures. The casing D forms a part of the magnetic circuit of the actuating-motor, as
70 will be presently described.

At E is shown the transverse shaft of the electric motor. This shaft is provided at its center with an eccentric F, which runs in an eccentric-box G. The box G slides in the
75 transverse ways C', provided for it in the bar C, as shown in Fig. 5. The rotation of the shaft E therefore causes harmonic reciprocating movement of the bar C and tool B, causing the tool to strike a rapid succession of
80 blows when brought against the painted or other surface to be acted upon.

The field-magnets of the electric motor form the main frame of the machine. The pole-pieces I have lettered N and S, respectively. There are two sets of pole-pieces, and they are placed so as to act on the two bipolar armatures H, which are mounted upon the transverse shaft E in bearings *h*, placed at the neutral points in the split yoke D' of
90 the field-magnet. Around the two ends of this double or split yoke D' are wound the field-magnet coils J. The N and S poles of the field-magnet extend around the respective coils at the end and on two sides, so
95 that two separate field-magnetic circuits are produced, one through the coils, pole-pieces, and one armature, the other circuit through the coils and the other pole-pieces and other armature. The object in dividing the yoke
100 D' is to make the apparatus symmetrical about the axial line of the reciprocating bar or tool-holder C, the eccentric F being placed at the center, as I have already said. Each

armature is provided with a commutator K and brushes L, which may be inclosed by casings M. The electric motor may be completely cased in by means of these casings 5 and the plates M' above and below. In Fig. 4 the plate M' is removed, the screw-holes by which it is secured to the magnet being shown. It will be seen that the reciprocating bar C extends axially through and is mounted in 10 the field-magnet, so as to reciprocate through it. The armatures, the bearings, and the other parts are all symmetrically arranged relatively to the reciprocating bar C.

The electric circuits of the motor, which is 15 shown as of the shunt type, are diagrammatically indicated in Fig. 4, the circuit starting from the two black points at the left of the figure. This circuit is controlled by a switch, which may consist of a movable spring- 20 plate O and contact O', actuated by the rotary knob O'', which turns the rectangular block o, provided with pins o'. These pins o' act upon the spring contact-plates O and cause it to make or break contact with the 25 plate O'. A spring o'', pressing against the rectangular block o, holds the parts in position when the handle O'' is released. This switch, or one of any other suitable type, is introduced to make or break the circuit of 30 the electric motor. The current is led to and from the apparatus by means of the two conductors P, which are wound upon a spring-drum P'. Connections are made with the re- 35 spective conductors P by means of the contact-plates Q, which rest in contact with metallic portions of the rotary drum P'. These metallic portions are connected with the ends of the respective conductors P, so that the 40 current can flow between the conductors and the fixed plates Q. The plates Q are connected with the circuits of the motor, one directly and the other through the switch, so that when the switch is closed the current flows from one contact Q, through the switch 45 and motor, back through the other contact and conductor P.

The drum P' is mounted on the transverse shaft between the two brackets R. The con- 50 ductors P are guided onto the drum by means of the two guide-rolls R'. A spring S, inclosed in a casing S', acts upon the drum-shaft to cause it to wind up the conductors P, and thereby support the whole instrument by means of the conductors P. The spring 55 should exert a tension a little greater than the weight of the apparatus, so that when released it would tend to rise. The drum is held from turning by means of the spring-pawl T, as shown in Fig. 2, which engages 60 the ratchet T' on one end of the shaft of the drum. The pawl T is provided with a projecting end t, which is in position to be readily accessible to the thumb of the operator's right hand when he grasps the handles V of 65 the instrument. By depressing the pawl the instrument may be raised and lowered and the pawl then released to hold it in position.

The handle O'' of the controlling-switch is in position to be operated by the thumb and forefinger of the left hand grasping the left- 70 hand handle V.

In Figs. 9 and 10 I show my preferred way of suspending the instrument. A crane or swinging arm W is pivotally mounted in suitable fixed supports. The crane carries two 75 insulated metallic rails w, upon which run the two metallic wheels w' of a trolley. The two conductors P are suspended from and respectively connected with the wheels w'. The current may be led to and from the rails 80 w by means of fixed brushes, which bear upon and make contact with two collars, the two collars being connected, respectively, with the two rails w. From this it will be seen that when two current-bearing wires are 85 connected to the two metallic contact-brushes the two conductors P, by which my instrument is suspended, will supply current to the actuating-motor. The crane W, swinging easily, permits the lateral adjustment of the 90 instrument. The trolley rolling upon the track w permits the forward and backward adjustment of the instrument, and the spring-drum P' and conductors P permit the convenient vertical adjustment of the instru- 95 ment. The conductors P being flexible, the edge or operating end of the tool may be directed in any desired angle and applied to the work with the greatest freedom.

The operation of my device is as follows: 100 Grasping the two handles V, the instrument is brought opposite the point of the ship's plates or other surface to be treated, the cranes swinging and the trolley adjusting itself automatically. By pressing the projection t 105 the pawl T releases the ratchet, and the instrument is elevated or lowered to the right point. Thereupon the switch is turned and the tool set going and its working end pressed against the surface to be treated at the de- 110 sired angle. As the work proceeds the instrument is raised, lowered, or otherwise adjusted at will, and when the work is finished it may be allowed to rise up out of the way, the pawl T holding it at any desired height. 115

In some respects the present invention forms an improvement upon the subject-matter of Letters Patent No. 545,923, granted to E. T. Thomas and others September 10, 1895, and in other respects a wide departure there- 120 from, and I refer to that patent as being closely related to my invention and as illustrating less perfected forms of similar apparatus, the defects of which I have sought to overcome. 125

By the term "tool" as used in the following claims, unless specially restricted to the cutting end or tool proper, B, I do not mean to exclude other parts not named which may be necessary to either the mounting or the 130 operation of the tool proper. Indeed all the suspended parts, whatever they may be, constitute the tool or instrument as a whole just as my apparatus in its most complete form

includes the crane; but I do not mean to include in the several claims any parts not necessarily implied by the terms of each claim.

What I claim is—

5 1. In combination, the reciprocating tool, the electric motor for operating it, flexible connections by which the tool is suspended, means for carrying the current to the said electric motor, and mechanical means for ad-
10 justing the tool vertically, laterally, and forward and backward, consisting of a crane provided with a trolley running upon the crane, and a take-up device for the flexible connections which support the said tool, substan-
15 tially as set forth.

2. In combination, the crane, the trolley running upon the crane, electric conductors P extending down from the said trolley, elec-
20 tric connections between the said trolley and stationary conductors, and the electrically-operated tool suspended by means of the said conductors P, substantially as set forth.

3. In combination, the crane, the trolley running upon the crane, electric conductors
25 P extending down from the said trolley, electric connections between the said trolley and stationary conductors, the reciprocating tool provided with supporting-handles, the elec-
30 tric motor for operating the said tool, the drum P' upon which the said conductors P are wound, the said drum being mounted upon the said electric motor, and means for wind-
35 ing up the said conductors upon the said drum or unwinding them, substantially as set forth.

4. In combination, the reciprocating tool, the electric motor therefor, the electric con-
40 ductors P for the said motor, means for winding and taking up or unwinding and letting out the said conductors P adjacent to the said motor, and a switch mounted in fixed relation to the said motor for controlling it, substantially as set forth.

5. In combination with the electrically-ac-
45 tuated tool and the casing or frame thereof, a drum mounted upon the said casing or frame, the conductors P arranged to be wound upon the said drum, a counterbalance-spring for the said drum, to counterbalance the weight
50 of the tool and its connected parts when suspended by means of the said conductors, and means for locking and releasing the said drum, substantially as set forth.

6. In combination, the electrically-operated
55 tool the electric conductors therefor, a drum mounted upon the casing or frame of the said tool, the ends of the said conductors being

secured to the said drum and respectively connected to the terminals of the electric mo-
tor by contacts or brushes Q bearing upon 60
metallic portions of the said drum, to which the ends of the said conductors are electric-
ally connected, substantially as set forth.

7. In combination, the reciprocating tool actuated by the transverse shaft, two arma- 65
tures mounted coaxially upon either side of the said tool and upon the said shaft, and the field-magnets, commutator-brushes, and elec-
trical connections, therefor, substantially as set forth. 70

8. In combination, the electric motor pro-
vided with two coaxially-rotating armatures, the reciprocating tool actuated by the shaft of
the said armatures and symmetrically placed 75
between the two said armatures, and the com-
mutator and electric connections for the said
motor, the whole being arranged symmetric-
ally to the said tool, substantially as and for
the purposes set forth.

9. In combination with the electric motor, 80
including a field-magnet and a pair of arma-
tures, the reciprocating tool-bar extending
through the said field-magnet and through the
field-magnet windings, the said tool-bar be-
ing actuated by the shaft of the said motor, 85
substantially as set forth.

10. In combination, the reciprocating tool-
bar and the electric motor therefor, the said
tool-bar extending transversely to the shaft
of the said motor, through the field-magnet 90
and field-magnet coils, substantially as set
forth.

11. In combination, the reciprocating tool,
comprising the holder or bar C, the eccentric
box G sliding transversely to the said bar or 95
holder and mounted therein in guides, the ec-
centric F turning in the said box G, the shaft
E, means for rotating the said shaft, and the
guides for the said bar or holder C, substan-
tially as set forth. 100

12. In combination with the reciprocating
tool bar or holder, the electric motor actuat-
ing the said reciprocating tool bar or holder,
and a tool end or tool proper movably secured
to the said reciprocating tool bar or holder, 105
and a spring interposed between the said tool
end or tool proper and the said reciprocating
tool bar or holder, substantially as set forth.

In testimony whereof I have hereunto set
my hand this 17th day of June, 1897.

WARREN P. FREEMAN.

Witnesses:

GEORGE H. SONNEBORN,
HAROLD BINNEY.