

G. H. CONDUCT.
FORGING MACHINE.
APPLICATION FILED JULY 11, 1908.

950,594.

Patented Mar. 1, 1910.

Fig. 1.

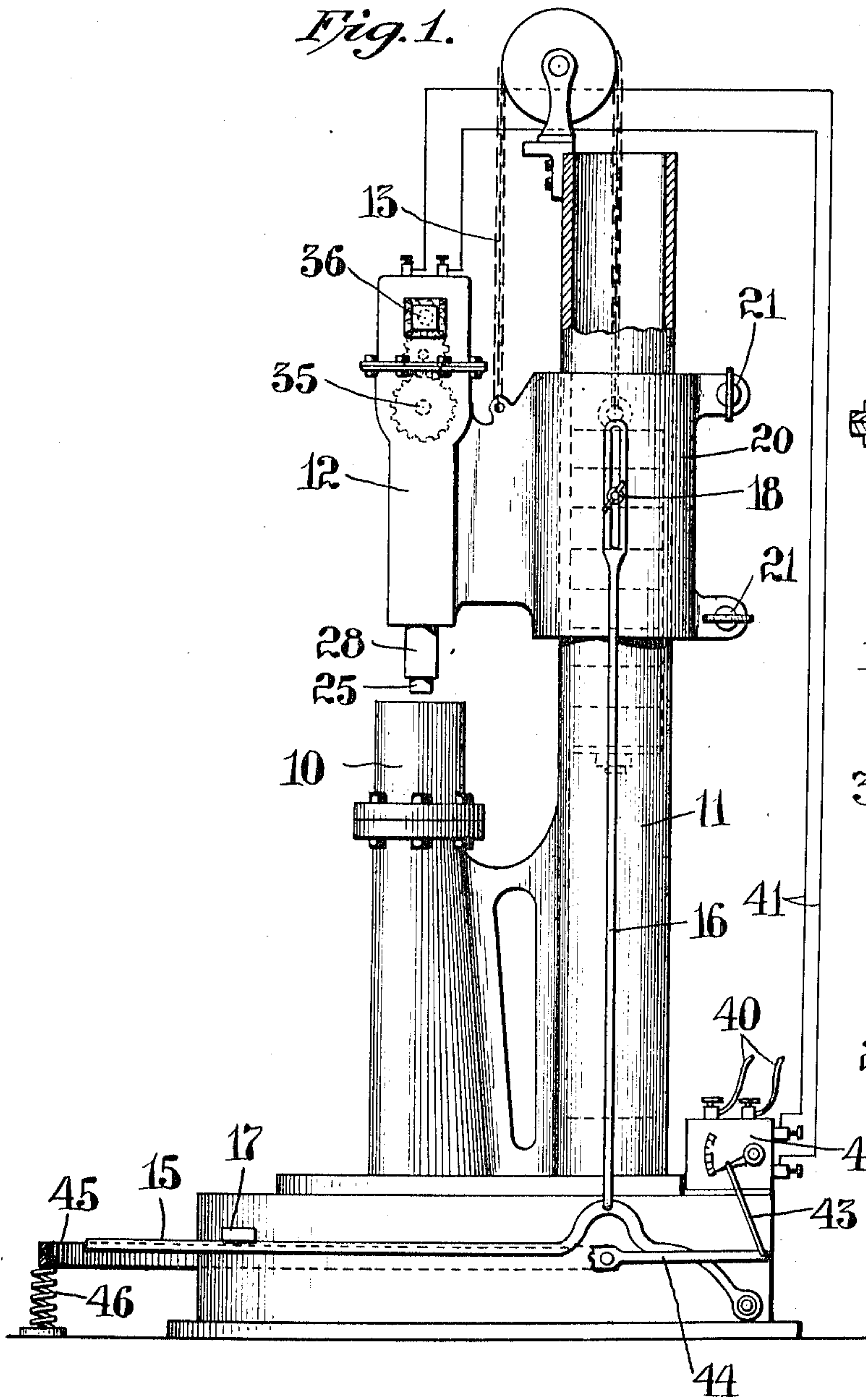
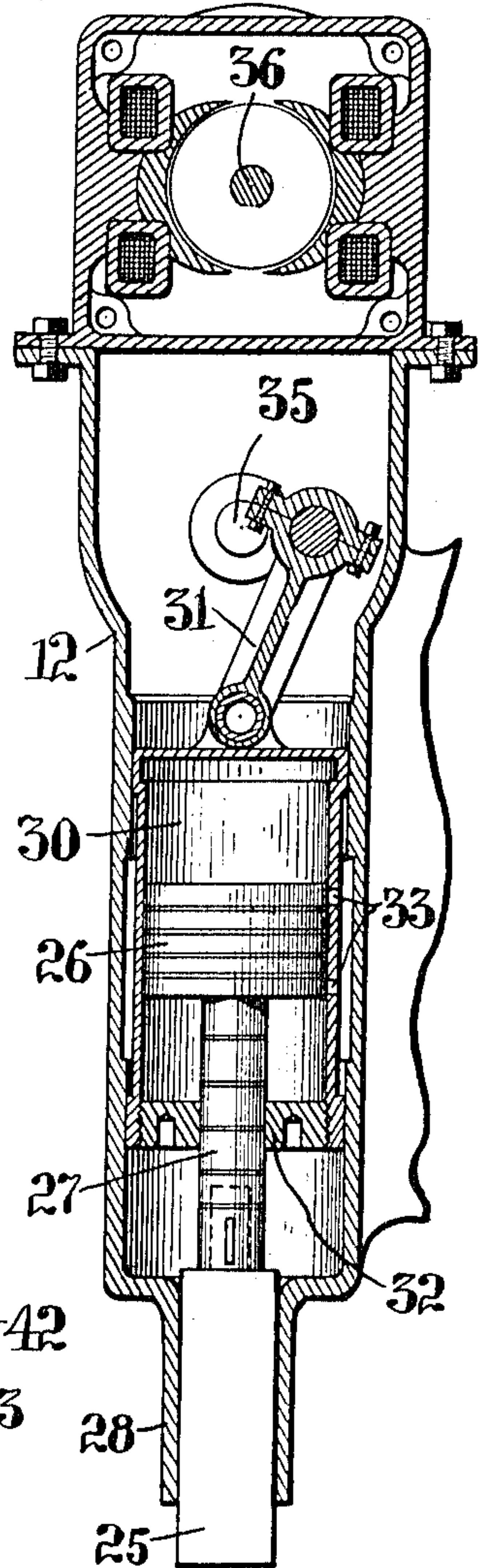


Fig. 2.



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by

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UNITED STATES PATENT OFFICE.

GEORGE HERBERT CONDUCT, OF PLAINFIELD, NEW JERSEY.

FORGING-MACHINE.

950,594.

Specification of Letters Patent.

Patented Mar. 1, 1910.

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To all whom it may concern:

Be it known that I, GEORGE HERBERT CONDUCT, a citizen of the United States, residing at Plainfield, New Jersey, have invented certain new and useful Improvements in Forging-Machines, of which the following is a specification, accompanied by drawings.

The invention although devised particularly for forging hammers, is applicable in many of its features to other machines, and I do not wish to be understood as restricting the use to forging machines.

The object of the invention is to produce such a machine that shall be very effective and simple in operation and easily used.

In the preferred form of the invention shown in the accompanying drawings the operator may employ both his hands in guiding and holding the work upon the anvil and by means of two treadles he can control not only the position of the hammer in respect to the work and the anvil, but also the speed of the hammer action. One of the treadles preferably elevates and lowers the hammer casing and the other treadle controls the speed of reciprocation of the hammer by means of an electric rheostat or controller which controls the operation of an electric motor mounted directly upon the casing. Such preferred embodiment of the invention is shown in the accompanying drawings, and from its description and the following claims the novel features which I desire to protect will be apparent.

In the drawings, Figure 1 is a side elevation of a forging machine embodying the invention, partly in section and partly broken away to illustrate details of construction. Fig. 2 is a sectional detail view longitudinally through the reciprocating parts of the hammer mechanism, the casing, and the motor.

The main frame of the machine is provided with a suitable work-holder or anvil 10 and column 11 which is preferably hollow and within which hangs the counter-weight for the casing 12 and the other parts that move up and down with the casing. A counter-weight chain running over a pulley at the top of the column is shown at 13. The counter-weight should preferably be heavy enough to give a rising tendency to the casing and to the treadle 15 which is pivoted on the base of the machine

and connected with the casing by the link or rod 16. A stop 17 limits the upward movement of the treadle 15 and consequently of the casing 12. The upper end of the link or rod 16 is slotted and is pivoted to the casing by means of a thumb-nut 18 which permits the adjustment of the casing 12 in respect to the link 16 when the thumb-nut is loosened, and provides for the initial setting of the casing at different heights from which it may be lowered or controlled after the thumb-nut 18 has been tightened, by depressing the treadle 15.

The sleeve portion 20, cast in one piece with the casing or attached thereto, fits and slides vertically upon the column 11. The sleeve is split and provided with screws 21 for binding it upon the column rigidly, when it is desired to use the machine for drop forging, or when it is desired to hold the casing very rigidly for any purpose. The hammer head 25 may be detachably but rigidly secured to the free flying piston 26 and rod or shank 27 of the hammer mechanism and be guided in the sleeve 28 at the lower end of the casing 12. The piston of the hammer travels in a reciprocating cylinder 30 which is externally guided in the casing 12. The upper end of the cylinder 30 is closed and to it the connecting rod 31 is pivoted. The lower end of the cylinder 30 is closed by the head 32 which surrounds and makes substantially gas-tight fit with the piston shank or piston rod 27, the confined bodies of air above and below the piston 26 acting as elastic cushions in a manner well understood in the Box drill and cause the reciprocation of the cylinder 30 to give what I might term an elastic reciprocation of the piston and hammer. Air inlets 33, which are closed by the piston 26 when in its mid position, tend to maintain the air cushions and prevent the piston 26 gradually working more and more toward one or the other end of the cylinder 30.

The connecting rod 31 is actuated by the crank shaft 35, which is geared, as indicated in dotted lines in Fig. 1, to the shaft 36 of the electric motor, which is (more or less diagrammatically) illustrated in the section in Fig. 2. The motor receives current from conductors 40 and 41 and is controlled by a rheostat or other suitable controller 42 mounted preferably on the base of the machine and connected by the link 43 to the control lever 44 of the outer treadle 45 which is normally upheld by the spring 46. When so upheld,

the motor should be at rest, but as the treadle 45 is depressed, the motor starts and its speed is controlled by depressing the treadle 45 more or less, as desired.

5 The operator's foot may simultaneously rest upon the treadles 15 and 45 and he may depress either one independently or with the other. Lever 45 and the controller 42 by determining the speed of the motor, deter-
10 mine the reciprocating speed of the hammer, that is to say, the number of reciprocations for a unit of time. The treadle 15, on the other hand, not only serves to move the cas-
15 ing downward and bring the hammer into operation upon the work, but it also serves to permit a very nice adjustment of the ham-
mer while at work, and the hammer being elastically actuated by the air cushions in the cylinder 30, may thus be regulated by
20 the treadle with great delicacy to give either heavy or light blows, as desired, while the operator's hands may be occupied in guiding and holding the work.

By adjusting the extensible connection
25 formed by the slotted link or rod 16 and its thumb-nut attachment 18 to the casing, the height of the casing may be altered and fixed at any desired initial position with the lever 15 against its stop 17.

30 What I desire to claim and secure by Let-
ters Patent is the following:

1. A forging machine having a column or support, a casing mounted thereon and ver-
35 tically adjustable in respect thereto, a re-
ciprocating hammer, actuating connections therefor carried by the said casing, and two
treadles, one provided with connections and means for controlling the actuation of the
40 hammer, and the other having connections for adjusting the casing.

2. A forging machine having a column or support, a casing mounted thereon and ver-
45 tically adjustable in respect thereto, a re-
ciprocating hammer, actuating connections therefor carried by the said casing, and two
treadles, one provided with connections and means for controlling the actuation of the
50 hammer, and the other having connections for adjusting the casing, the last said con-
nections comprising means for accommodat-
ing different heights of the casing for a given position of treadle.

3. A forging machine having a column or support, a casing mounted thereon and ver-
55 tically adjustable in respect thereto, a re-
ciprocating hammer, actuating connections therefor carried by the said casing, and two
treadles, one provided and connected with means for controlling the speed of the ham-
60 mer and the other provided with means for vertically adjusting the casing.

4. A forging machine having a column or support, a casing mounted thereon and ver-
65 tically adjustable in respect thereto, a re-
ciprocating hammer, actuating connections

therefor carried by the said casing, a motor also carried by the said casing, and two treadles, one provided with connections and means for controlling the actuation of the hammer and the other having connections
70 for adjusting the casing.

5. A forging machine having a column or support, a casing mounted thereon and ver-
75 tically adjustable in respect thereto, a re-
ciprocating hammer, actuating connections therefor carried by the said casing, a motor also carried by the said casing, and two
treadles, one provided with connections and means for controlling the actuation of the
80 hammer, and the other having connections for adjusting the casing, the last said con-
nections comprising means for accommodat-
ing different heights of the casing for a given position of treadle.

6. A forging machine having a column or
85 support, a casing mounted thereon and ver-
tically adjustable in respect thereto, a re-
ciprocating hammer, actuating connections therefor carried by the said casing, a motor
also carried by the said casing, and two
90 treadles, one provided and connected with means for controlling the speed of the ham-
mer and the other provided with means for varying the position of the casing vertically.

7. A forging machine having a reciprocating hammer, a casing in respect to which the
95 hammer is reciprocated, a support on which the casing is adjustable in the directions in
which the hammer reciprocates, and mechanism for moving the casing in said directions,
100 comprising an extensible connection for ac-
commodating the said mechanism to differ-
ent initial adjustments of the casing rela-
tively to the said support.

8. A forging machine having a reciprocating hammer, a casing in respect to which
105 the hammer is reciprocated, a support on which the casing is adjustable in the direc-
tions in which the hammer reciprocates, and mechanism for moving the casing in said
110 directions comprising a treadle pivoted on the support and an extensible connection for
accommodating the said mechanism to dif-
ferent initial adjustments of the casing rela-
tively to the said support. 115

9. A forging machine having a support or column, a hammer and hammer casing
mounted and adjustable upon said column,
a treadle having a pivot fixed in respect to
the column, and a connection therefrom to
120 the said casing for moving it, said connec-
tion comprising an extensible connection.

10. A forging machine having a support or column, a hammer and hammer casing
125 mounted and adjustable upon said column,
a treadle having a pivot fixed in respect to the column, and a connection therefrom to
the said casing for moving it, said connec-
tion comprising a link adjustably pivoted in
respect to the casing. 130

11. A forging machine having a support or column, a hammer and hammer casing mounted and adjustable upon said column, a treadle having a pivot fixed in respect to the column, and a connection therefrom to the said casing for moving it, means for giving a rising tendency to the casing and treadle, and a limiting stop therefor.

12. A forging machine having a support or column, a hammer and hammer casing mounted and adjustable upon said column, a treadle having a pivot fixed in respect to the column, and a connection therefrom to the said casing for moving it, means for giving a rising tendency to the casing and treadle, a limiting stop for the treadle, and means for adjusting the said treadle connections for accommodating different positions of the casing.

13. A forging machine having a column or support, a casing, a hammer operable therein, and a treadle pivoted to the said support and provided with connections for raising and lowering the casing, said connections comprising means for varying the position of the casing for a given position of the treadle.

14. A forging machine having an anvil or work holder, a casing, a mechanically re-

ciprocated hammer - actuating member mounted in the casing, a hammer air-cushioned in respect thereto and actuated thereby, a support upon and in respect to which the casing is movably mounted, a treadle and means actuated thereby for moving the casing in respect to the support and the anvil, and a second treadle and means operable thereby for controlling the hammer.

15. A forging machine having an anvil or work-holder, a casing, a mechanically reciprocated hammer - actuating member mounted in the casing, a hammer air-cushioned in respect thereto and actuated thereby, a support upon and in respect to which the casing is movably mounted, a treadle and means actuated thereby for moving the casing in respect to the support and the anvil, a motor mounted on the casing and driving the said reciprocated member, and means for controlling the said motor, comprising a treadle and connections therefrom.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGE HERBERT CONDUCT.

Witnesses:

F. A. RHEA,

FRANCES KLEINTEICH.