J. F. ZWIKER.

THROTTLE CONTROL FOR FLUID OPERATED HAMMERS.

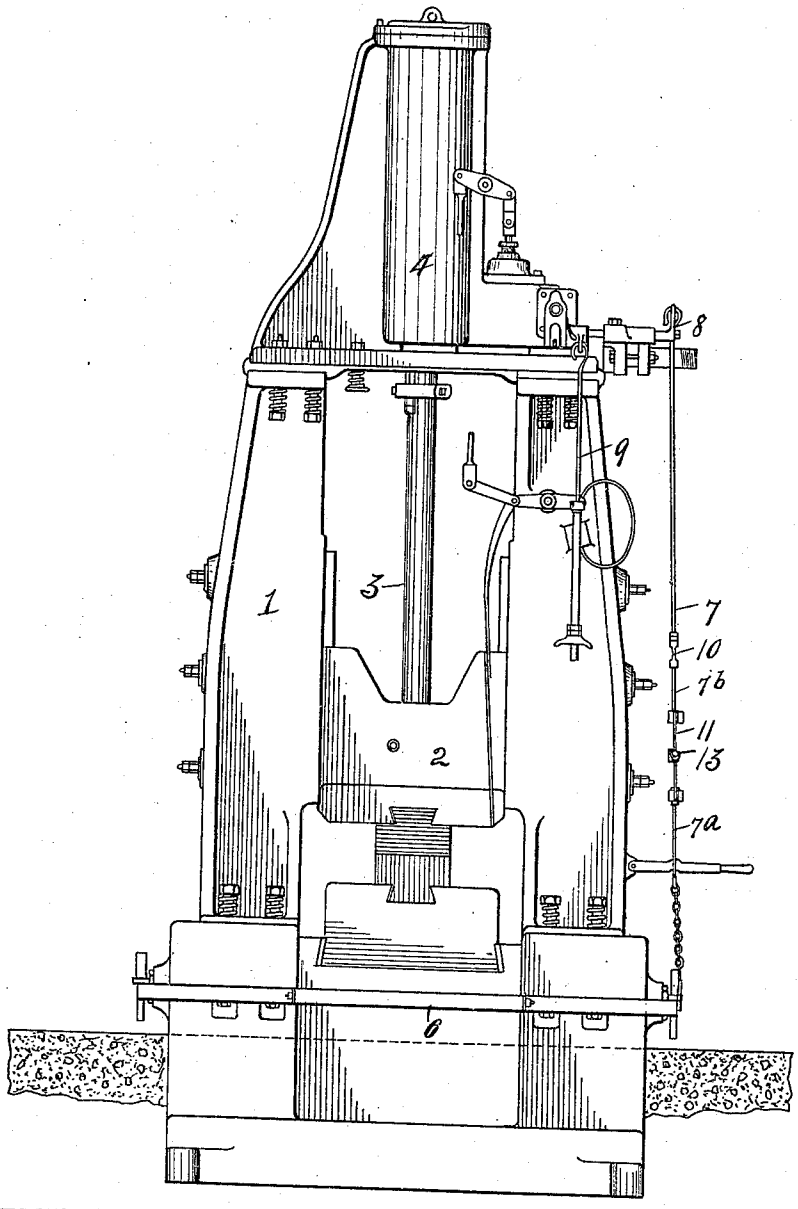
APPLICATION FILED JAN. 16, 1911.

**990,944.**

Patented May 2, 1911.

2 SHEETS—SHEET 1.

*Fig. 1*




WITNESSES.
C. E. Walker.
M. G. Gaskell.

INVENTOR.
Jacob F. Zwiker
By Owen & Owen,
His attys.

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2 SHEETS—SHEET 2.

Fig. 2

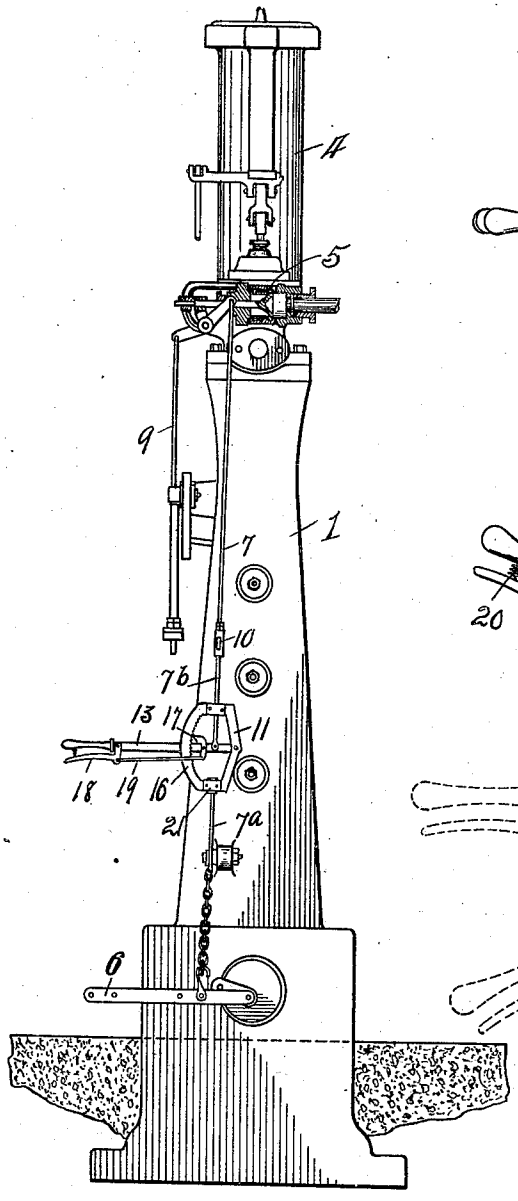



Fig. 3

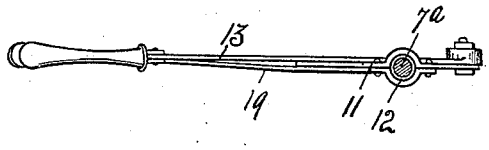
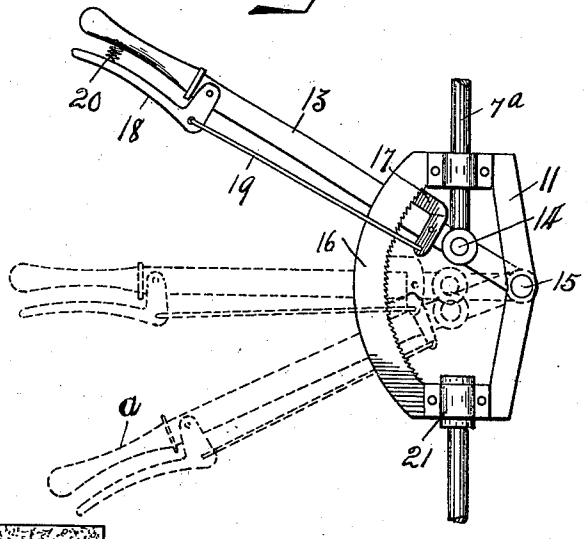



Fig. 4

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# UNITED STATES PATENT OFFICE.

JACOB F. ZWIKER, OF TOLEDO, OHIO.

## THROTTLE CONTROL FOR FLUID-OPERATED HAMMERS.

990,944. Specification of Letters Patent. Patented May 2, 1911.

Application filed January 16, 1911. Serial No. 602,914.

*To all whom it may concern:*

Be it known that I, JACOB F. ZWIKER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Throttle Control for Fluid-Operated Hammers or the Like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to throttle control means which is particularly adapted for use in connection with fluid pressure hammers or other similar apparatus in which a foot-treadle or similar control means has connection with and is moved from normal position to open the throttle of the apparatus to admit steam or other fluid pressure to the operating parts thereof. With the apparatus of this nature heretofore used no provision, notwithstanding the dire need for the same, has been made for cutting off the fluid pressure to the working parts except by closing the main valve at the rear of the machine, or by turning the turnbuckle or other adjusting means usually provided in the connection between the treadle and throttle, the former being seldom done due to the inconvenience of passing to the rear of the machine, while the latter is not done as the treadle adjustment is thereby lost.

The object of my invention is the provision in an apparatus of this class of simple and efficient means within convenient reach of the operator which can be easily and quickly operated to effect a lengthening of the treadle and throttle connection to lower the treadle to inoperative position whereby to prevent an accidental tripping thereof and permit a closing of the throttle to prevent the unnecessary consumption of steam or other fluid while waiting for a heat or for other purposes, and is also operative to effect a shortening of such connection and a consequent raising of the treadle to operative position, or an adjustment of said connection to effect an automatic repetition of the hammer strokes.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a front elevation of a steam hammer embodying my invention. Fig. 2 is a side elevation thereof with parts in section, and Figs. 3 and 4 are enlarged plan and side views of the control parts of my invention.

Referring to the drawings, 1 designates the frame in the present instance, of a steam hammer, 2 the hammer, the plunger rod 3 of which is attached to a plunger working in the cylinder 4, 5 the throttle which controls the admission of steam, or other operating fluid, if such be used, to the operating parts common to apparatus of this class, 6 the foot treadle, and 7 the connection between the treadle and a lever 8 attached to the throttle. The throtttle is yieldingly influenced to close by a spring depressed rod 9, which attaches to the lever 8 for such purpose. Interposed in the connection 7 is a turnbuckle 10 to facilitate an adjustment of such connection as desired. Under normal working conditions the connection 7 is suitably adjusted to normally retain the treadle 6 elevated and the throttle valve 5 open to such an extent as to admit sufficient steam or other fluid pressure to the plunger controlling valve to hold the plunger and attached hammer elevated. Upon a depression of the treadle the throttle is opened to a greater extent and the control valve is moved to admit pressure on top of the plunger to force it down. With this construction, it is apparent that the foot treadle, except when depressed by pressure thereon, stands in elevated or operative position, and is apt to be accidentally depressed and effect injury to a person working thereon, if the main steam valve is not closed, and, in fact many accidents have been occasioned by reason of this, and also that the same effects a large consumption of steam or other fluid, as a considerable amount is used to retain the hammer elevated when the same is not being operated, as when waiting for a heat.

The purpose of my invention is to interpose means within the connection 7, which means is in convenient reach of the operator and capable of being easily and quickly operated to effect a sufficient lengthening of said connection, to lower the treadle to in-

operative position or to effect a shortening of such connection to raise the treadle from lowered to operative position. To accomplish this I interpose a yoke or frame 11 in the connection 7, preferably below the turnbuckle 10, to the lower end of which is attached a section $7^a$ of the connection while the upper section $7^b$ of the connection passes freely through an opening 12 in the upper end of said yoke and pivotally attaches to a lever 13, as at 14, which lever is fulcrumed to one side of the yoke 11, as at 15, and extends across the opening therein. The side of the yoke 11 which opposes the one to which the lever is fulcrumed is in the form of a segment 16 the arc of which is struck from the lever axis, and one edge of this, the inner in the present case, is notched to coöperate with a pawl 17 carried by the lever to retain the lever in adjusted position relative to the yoke, as is apparent. The movement of the pawl is controlled by a hand-latch 18, which is connected to the pawl by a rod 19 and influenced by a spring 20 to normally retain the pawl in engagement with the segment teeth. When the lever 13 stands in the position shown in Fig. 2 or in dotted lines in Fig. 4, the connection 7 is of suitable length to hold the treadle 6 elevated in operative position, while a raising of the lever from such position effects a lengthening of the connection 7 and a consequent lowering of the treadle to inoperative position.

The yoke 11 is preferably swiveled to the lower connecting rod section $7^a$, as indicated at 21, and the upper section $7^b$ thereof is adapted to turn in the turnbuckle 10, or in any other suitable manner, to permit a horizontal turning of the lever 13 and yoke 11 so that the same may be conveniently operated from in front, in rear or at the side of the machine, as desired.

It is evident that I have provided what might be termed a floating throttle control, which is in convenient reach of the operator and may be easily and quickly operated to throw the treadle into operative or inoperative position, thus lessening the liability of accident and facilitating the setting of dies.

It is found in practice that another important feature of my invention resides in its capability of being adjusted to effect an automatic repeating of the hammer stroke, as this may be accomplished by simply throwing the lever 13 to substantially the dotted line position *a* (Fig. 4), or below the position shown in Fig. 2, as the throttle is thereby opened to a sufficient extent to cause such action.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts, except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is,—

1. In an apparatus of the class described, the combination with the throttle, the treadle, and the connection therebetween, of lever means carried by said connection and movable to effect a shortening or lengthening thereof to place the treadle in operative or inoperative positions.

2. In an apparatus of the class described, the combination with the throttle, the treadle, and the connection therebetween, of a member interposed in said connection and attached to a part thereof, and a lever fulcrumed to said member and attached to another part of said connection and movable relative to said member to effect an adjustment of the length of said connection to place the treadle in operative or inoperative positions.

3. In an apparatus of the class described, the combination with a throttle, a member movable to open said throttle, and connection between said throttle and member, of a yoke interposed in said connection and attached to a part thereof, said yoke having a notched segment, a control lever fulcrumed to said yoke and attached to another part of said connection, said lever and yoke being relatively movable to adjust the length of said connection, and means carried by the lever for coöperating with said segment to hold the lever and yoke in relatively adjusted positions.

4. In an apparatus of the class described, the combination with a throttle, a member movable to open said throttle, and connection between said throttle and member, of a yoke attached to a part of said connection for horizontal movements, a control-lever fulcrumed to said yoke and attached to another part of said connection, said lever, and yoke being capable of horizontal swinging movements relative to the connection and of relative movements to adjust the length of the connection, and means carried by the lever and coöperating with a part of the yoke to retain the lever and yoke in relative adjustment.

5. In an apparatus of the class described, the combination with a throttle, a member movable to open said throttle, and connection between said throttle and member, of a quickly operative control mechanism carried by said connection and movable to close the throttle, and to open it to various degrees within a predetermined range of adjustment.

6. In an apparatus of the class described, the combination with a throttle, and means movable to operate such throttle, of a quickly operative control mechanism carried by said means and operable to move said means to close the throttle or to open it to various

degrees within a predetermined range of adjustment.

7. In an apparatus of the class described, the combination with a throttle, a member movable to open said throttle and connection between said throttle and member, of a quickly operative control mechanism carried by said connection and freely movable therewith, said mechanism being operable independently of said member to effect a closing or opening of the throttle to various degrees within a predetermined range of adjustment.

8. In an apparatus of the class described, the combination with a throttle and means manually movable to operate such throttle, of a quickly operative control mechanism carried by said means for movements therewith and operable to move at least part of said means to close or open the throttle to various degrees within a predetermined range of adjustment.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

JACOB F. ZWIKER.

Witnesses:
C. W. OWEN,
GLEE GASKELL.