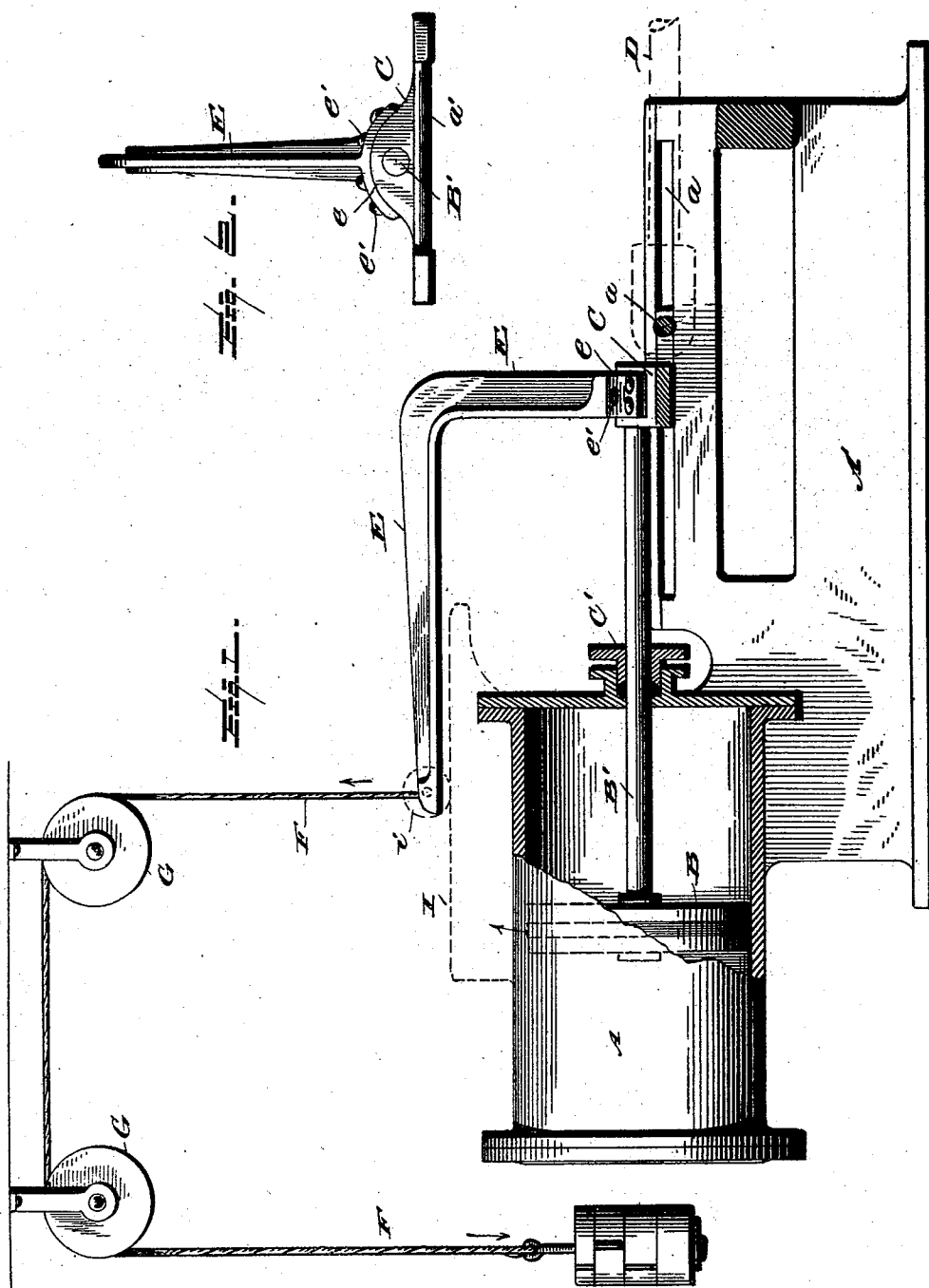


(No Model.)

F. T. GUIHER.
STEAM ENGINE ATTACHMENT.

No. 510,131.

Patented Dec. 5, 1893.



Witnesses:

L. C. Hills,
E. A. Bond

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UNITED STATES PATENT OFFICE.

FRANK. T. GUIHER, OF WAYNESBURG, PENNSYLVANIA.

STEAM-ENGINE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 510,131, dated December 5, 1893.

Application filed May 16, 1893. Serial No. 474,389. (No model.)

To all whom it may concern:

Be it known that I, FRANK. T. GUIHER, a citizen of the United States, residing at Waynesburg, in the county of Greene, State of Pennsylvania, have invented certain new and useful Improvements in Steam-Engine Attachment, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in steam engine attachments, and it has for its objects among others to provide a simple means for taking the wear off the under side of the piston head or the bottom of the cylinder by taking the weight of the piston head off the bottom of the cylinder. This may be accomplished in several ways one of which is herein illustrated. In its primary form it comprises an arm attached to the cross-head or to the piston rod and bent back so that its free end is substantially over the center of gravity and said free end supported in any suitable manner; in one form it has attached thereto a cord or chain which passes over a pulley or pulleys and carries a counterbalance weight. This weight is the same as that of the combined weight of the piston-head, piston-rod and cross-head so that the piston will be free to move back and forth without dragging on the bottom of the cylinder. In lieu of the cord and weight a spring or springs may be employed, and other ways may be devised for supporting the free end of the arm to accomplish the same purpose. The improvement can be readily applied to pistons on engines already in use at little expense. It increases materially the life of an engine.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification and in which—

Figure 1 is a side elevation with a portion of the cylinder broken away and other parts in section showing the application of my improvement. Fig. 2 is an end view of the arm and cross-head to which it is attached.

Like letters of reference indicate like parts in both of the views.

Referring now to the details of the drawings by letter, A designates the cylinder, A' the bed or support, B the piston-head, B' the piston-rod and C the cross-head, all of known or preferred construction except as hereinafter specified.

C' is the stuffing box through which the piston-rod passes.

The cross-head slides in the ways *a* as seen in Fig. 1, and is provided with the cross rod *a'* to which the connecting rod D is designed to be connected as indicated by dotted lines in Fig. 1.

E is an arm having a vertical portion which is extended upward sufficiently to clear the upper surface of the cylinder as shown and terminating in a horizontal portion E' the free end of which is extended over the center of gravity of the piston-head, piston-rod and cross-head and arm and has connected thereto the cord or chain F which passes over the pulleys G which are suitably supported over the cylinder as seen in Fig. 1. The other end of the cord or chain which hangs vertically carries the weight H of any suitable form, in sections if desired, and this weight is just the same as the combined weight of the piston-head, piston-rod, arm and cross-head so as to keep the piston-head from dragging on the bottom of the cylinder, thus permitting it to run with less friction and guarding against wear upon the bottom of the cylinder more than at other points. The lower end of the vertical portion of the arm is shown as connected to the cross-head and is provided with a curved foot *e* to conform to the curved portion of the cross-head to which it is secured in any suitable manner, as by the bolts *e'*.

I may sometimes provide an extension on the upper face of the cylinder upon which the free end of the arm may slide; in Fig. 1 such an extension is shown by dotted lines at I, and the free end of the arm is provided with a small roller *i* which travels upon the upper face of the extension; in this form the cord and weight and pulleys are dispensed with.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

The free end of the arm may be otherwise supported—by a spring or springs or other means.

What I claim as new is—

5 1. The combination with a piston-head and its cylinder, of an arm mounted to move with the piston-head and said arm carrying devices to counterbalance the weight of the same to relieve the pressure thereof on the
10 bottom of the cylinder, as set forth.

2. The combination with a piston-head and its cylinder, of an arm mounted to move with the piston-head and having its free end extended over the center of gravity and carry-

ing a counterweight as and for the purpose 15 specified.

3. The combination with the cylinder, piston-head, piston-rod and cross-head, of an arm mounted on and traveling with the piston-rod and having a horizontal portion to 20 which is connected a counterbalance weight, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK. T. GUIHER.

Witnesses:

J. B. RINEHART,
J. W. MUNNELL.