(No Model.) 2 Sheets—Sheet 1.

H. LAPP.

APPARATUS FOR REGULATING AND BALANCING WEIGHT OF BORING RODS IN DEEP BORING.

No. 557,837. Patented Apr. 7, 1896.

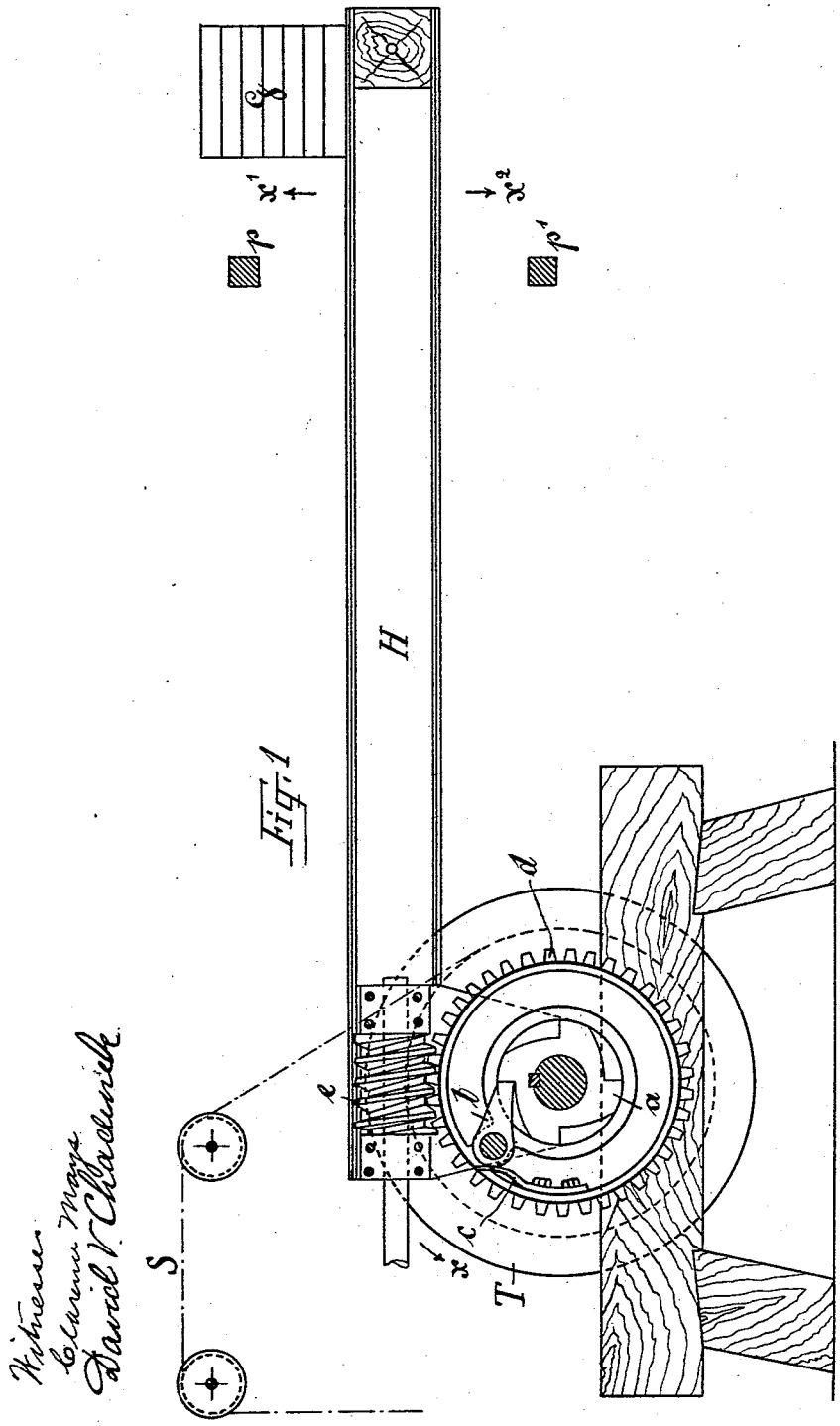

Fig. 1

Witnesses
Edwin Mays
David V. Chadwick

Inventor
Heinrich Lapp
by M. L. Hubbell Atty

(No Model.) 2 Sheets—Sheet 2.

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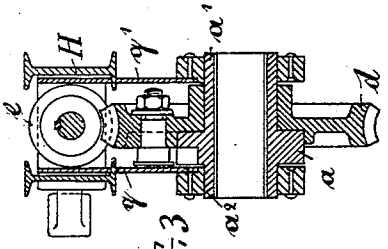

Fig. 3

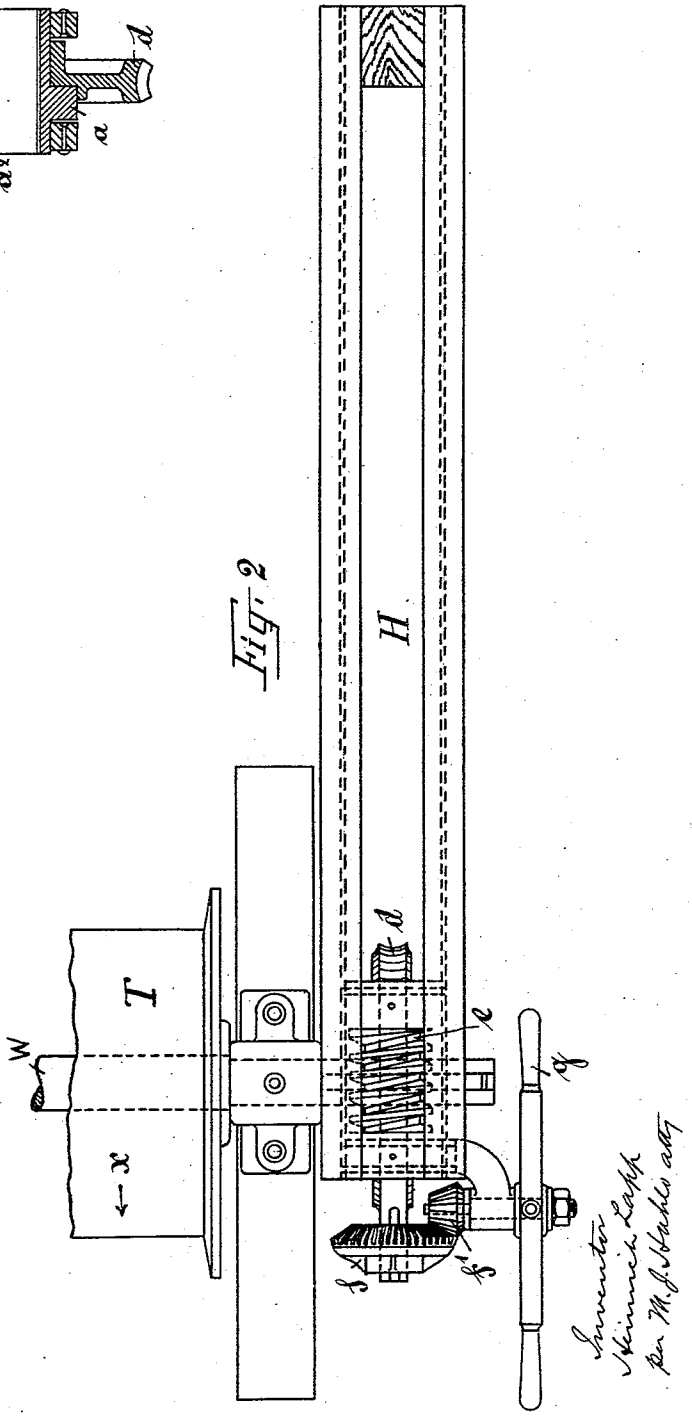

Fig. 2

Witnesses
Edmund Mayr
David F. Chadwick

Inventor
Heinrich Lapp
per M. J. Wakeley atty

UNITED STATES PATENT OFFICE.

HEINRICH LAPP, OF ASCHERSLEBEN, GERMANY.

APPARATUS FOR REGULATING AND BALANCING WEIGHT OF BORING-RODS IN DEEP BORING.

SPECIFICATION forming part of Letters Patent No. 557,837, dated April 7, 1896.

Application filed January 2, 1896. Serial No. 574,013. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH LAPP, a subject of the King of Prussia, German Emperor, residing at Aschersleben, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Apparatus for Regulating and Balancing the Weight of Boring-Rods in Deep Boring, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to deep-boring apparatus, and has for its object to provide a mechanism for partially balancing the weight of the drill-bars, especially in the case of diamond drills. It is very important that the pressure upon the drill, which is produced by the weight of the bars M and C, shall be uniform and adapted to be easily regulated, as with too great a pressure the drill and the bars are liable to break, while with too small a weight the work does not proceed with sufficient rapidity. Moreover, the mechanism must be arranged for enabling it to be easily thrown out of gear, in order that the boring-bars—for instance, when they have been pulled out—may be easily lowered to the desired depth.

In the accompanying drawings I have shown the improved mechanism constructed according to my said invention.

Figure 1 represents a vertical section; Fig. 2, a plan, and Fig. 3 a partial section on the line 1 2 of M and C, Fig. 2.

The boring-bars are suspended from the rope or chain S wound upon the drum T. Counterweights G rest upon a lever H, which is connected with the drum T, so that the weight of the bars may be balanced to the desired degree.

The lever H is connected with the drum T by means of a ratchet device in the following manner: Upon the shaft W of the drum T is keyed the ratchet-wheel a, upon whose prolonged naves a' and a^2 the worm-wheel d and the supports q and q' of the lever H are adapted to turn. The aforesaid lever H supports a worm e. To the worm-wheel d is fixed the pawl b, which couples the ratchet-wheel a with the worm-wheel d, and may be held in a certain position by a spring c. The worm e can be turned by means of a pair of bevel-wheels f and f' and hand-levers g. Two fixed stops p and p' limit the movement of the lever H. In the lowering of the boring-bars the drum T turns in the direction of the arrow x. The ratchet-wheel a participates in this movement, and, when the pawl b is engaged, also the worm e and the lever H. Thus the latter moves upward until it strikes against the stop p, so that the bars cannot sink any farther. If now the worm e is turned by means of the hand-levers, causing the worm-wheel to turn in the direction of the arrow x, the pawl will be disengaged and the lever will move downward again, so that the boring-bars may be further lowered. If now the worm e is turned so often that the lever H will always be in suspension between the two stops p and p', and if the counterweight upon the lever H is such that the weight of the bars is only partly balanced, a uniform pressure will be exerted upon the drill. The more rapidly the drill sinks the more rapidly the lever will move upward and the oftener it will be necessary to turn the worm e.

In case it is desired to throw the mechanism out of gear, the drum T is turned backward by hand, then the lever H sinks and bears upon the stop p', and in the further turning movement the pawl b is disengaged from the teeth of the ratchet-wheel a and held in this position by the spring c, so that the drum can now move without being acted upon by the lever H. On the pawl being caused to reëngage with the ratchet-wheel the lever will follow the movement of the drum again.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

In a deep-boring apparatus mechanism for lowering the boring-bars and balancing the weight of the same, comprising a drum T, to which the boring-bars are fixed by means of a rope or chain, the said drum being coupled with a weighted lever H pivoted upon the axis of said drum by a ratchet device a b, and adapted to be adjusted by a worm-gear e d substantially as set forth.

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

HEINRICH LAPP.

Witnesses:
JULIUS MUTH,
M. C. MUTH.