

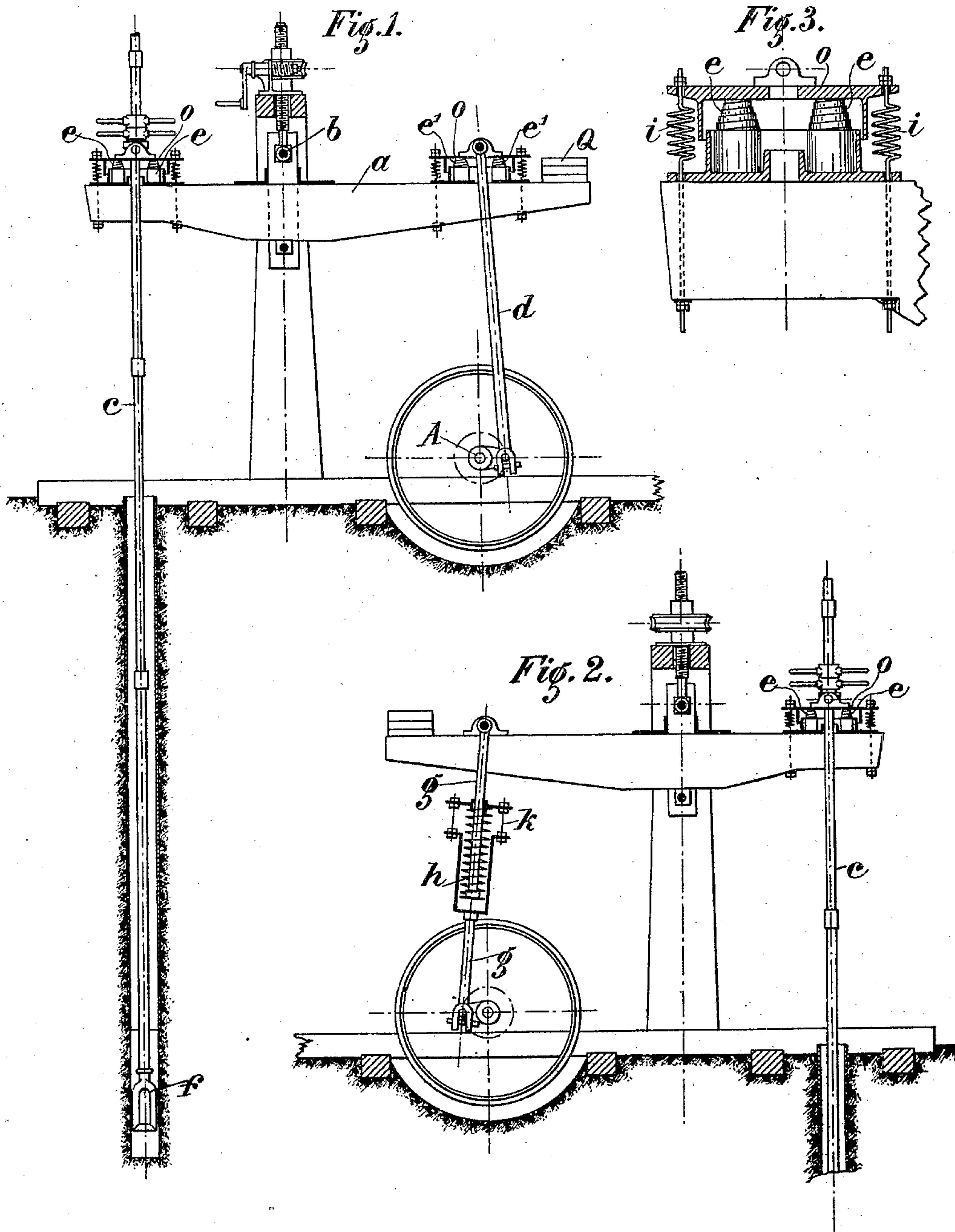
No. 689,147.

Patented Dec. 17, 1901.

J. VOGT.
APPARATUS FOR DEEP BORING.

(Application filed Dec. 28, 1897.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH VOGT, OF NIEDERBRUCK, NEAR MASSEVAUX, GERMANY.

APPARATUS FOR DEEP BORING.

SPECIFICATION forming part of Letters Patent No. 689,147, dated December 17, 1901.

Application filed December 28, 1897. Serial No. 663,832. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH VOGT, manufacturer, a subject of the Emperor of Germany, residing at Niederbruck, near Massevaux, Alsace, Germany, have invented new and useful Improvements in Apparatus for Deep Boring, (which has been patented in France by Letters Patent No. 264,691, dated March 5, 1897; in Great Britain by Letters Patent No. 1,036, of 1899, and No. 30,024, dated December 18, 1897; in Switzerland, No. 15,758, dated December 20, 1897; in Italy, Vol. XXXIII, No. 45,759, Vol. XC, No. 285, dated December 31, 1897; in Austria, Bd. 48, S. 507, dated January 22, 1898, and in Sweden, No. 9,714, dated December 23, 1897,) of which the following is a clear and complete specification.

In ordinary boring apparatus of the Canadian or Kind type, with a free-falling boring-tool, the latter is not permanently secured to the boring bar or rod, a construction which gives rise to loss of time, shortening of the operative or useful stroke of the boring-tool, and reduction in the number of blows of the said tool per minute. For this reason endeavors have for a long time been made to permanently and rigidly connect the boring-tool with the boring-rod in apparatus for deep boring with a free-falling boring-rod. Now according to this invention, in order that this rigid connection of the boring-tool with the boring-rod shall be effected without increasing the liability to fracture of the boring-rod and of its coupling-sleeves, I provide apparatus for deep boring of the kind having a free-falling boring-rod with an elastic cushion between the rod and the rotating shaft which operates it.

In Figures 1 and 2 of the accompanying drawings I have shown, by way of example, two forms of apparatus for deep boring having my improvements applied thereto. Fig. 3 illustrates a detail.

In the apparatus represented in elevation in Fig. 1 the boring-rod *c*, carrying the boring-tool *f* at its lower end, rests freely upon the oscillating beam *a*, which is pivotally suspended at *b*, bears a weight *Q*, and is operated through the medium of a connecting-rod *d*, actuated by a rotating shaft *A*, an elastic cushion of any suitable kind—for instance, a

cushion formed of several helicoidal springs *e*—being interposed between the two parts *c* and *a* to deaden the jar or shock that the free fall of the rod *c* tends to produce upon the beam *a*. This intermediate cushion has no effect unless the apparatus is operating at a certain velocity. At a low velocity the boring-tool strikes the bottom of the bore-hole without producing any sensible useful effect. When the movement is accelerated, the rod *c* in its descent and by reason of the momentum which it thereby acquires compresses the cushion and strikes the bottom of the bore-hole with a certain force, the downward movement of the rod then being in advance of that of the corresponding part of the beam. As soon as the boring-tool has reached the bottom of the bore-hole the extension or expansion of the intermediate elastic cushion raises the rod sharply, thereby preventing the occurrence of the jars, which would in time cause the said rod and the coupling-sleeves connecting the sections thereof to fracture. As the boring-tool only scrapes the ground, so to say, and as it is sharply and quickly raised, it cannot remain caught in a crack or crevice in the ground. The extension and the compression of the elastic cushion ease the working of the motor which operates the apparatus, increase the effective stroke of the boring-tool, and thereby enable the crank which operates the connecting-rod *d* to be shortened and the speed of the motor to be increased. An elastic cushion is also advantageously arranged between the beam *a* and the rotating shaft *A*. This second elastic cushion may be formed by springs *e'*, placed between the beam *a* and the connecting-rod *d*, Fig. 1, or of a spring *h*, connecting the two parts of the connecting-rod *g*, transmitting the movement of the rotating shaft of the motor to the beam *a*, carrying the boring-rod, Fig. 2.

The letter *i* designates regulating-springs, the tension of which may be regulated. These springs serve to avoid that the plate *o* springs suddenly up.

In the construction of Fig. 2 the tension of the spring *h* can be regulated through bolts *k*. Instead of the springs *e e' h*, the equivalents—elastic cushions—may be employed, as india-rubber buffers, air-buffers, oil-buffers, &c.

I am aware that it is not new, broadly, to

cushion the operating or connecting rod of a well-boring apparatus between the power-crank and the oscillating beam, and I do not claim this; nor do I claim, broadly, the application of a cushion at the point of attachment of a flexible connector carrying the boring-tool to such beam. My invention is restricted to boring apparatuses employing a free-falling rigid boring-rod permanently connected with the boring-tool.

What I claim is—

1. In a deep-boring apparatus, the combination with a beam mounted to oscillate, and means for oscillating it, of a rigid boring-rod *c* resting freely upon said beam and having a boring-tool *f* permanently secured to its lower end, a plate *o*, in which said boring-rod is mounted, and a plurality of springs arranged between said plate and beam, substantially as set forth.

2. An apparatus for deep boring, having an oscillating beam, means for rocking said beam, a rigid boring-rod *c*, having a boring-tool *f*, permanently secured to its lower end, a plate *o*, in which said boring-rod is mounted, a plurality of springs arranged between

said plate and said beam, and regulating-springs *i*, connecting the plate *o* with the oscillating beam, substantially as set forth.

3. An apparatus for deep boring, comprising an oscillating beam, a rotating crank, a connecting-rod coupling the said crank with a plate *o*, to which said connecting-rod is pivotally connected, the said plate, a plurality of springs between said plate and the beam, a rigid boring-rod resting freely upon the said beam and having a boring-tool *f*; permanently secured to its lower end, said boring-tool, a plurality of springs between the plate *o*, in which said boring-rod is mounted, and the said beam, a plurality of springs arranged between the said plate and the said beam, and regulating-springs *i*, connecting both of said plates with the oscillating beam, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH VOGT.

Witnesses:

GEORGE GIFFORD,
AMAND RITTER.