

No. 616,586.

Patented Dec. 27, 1898.

A. RAKY.

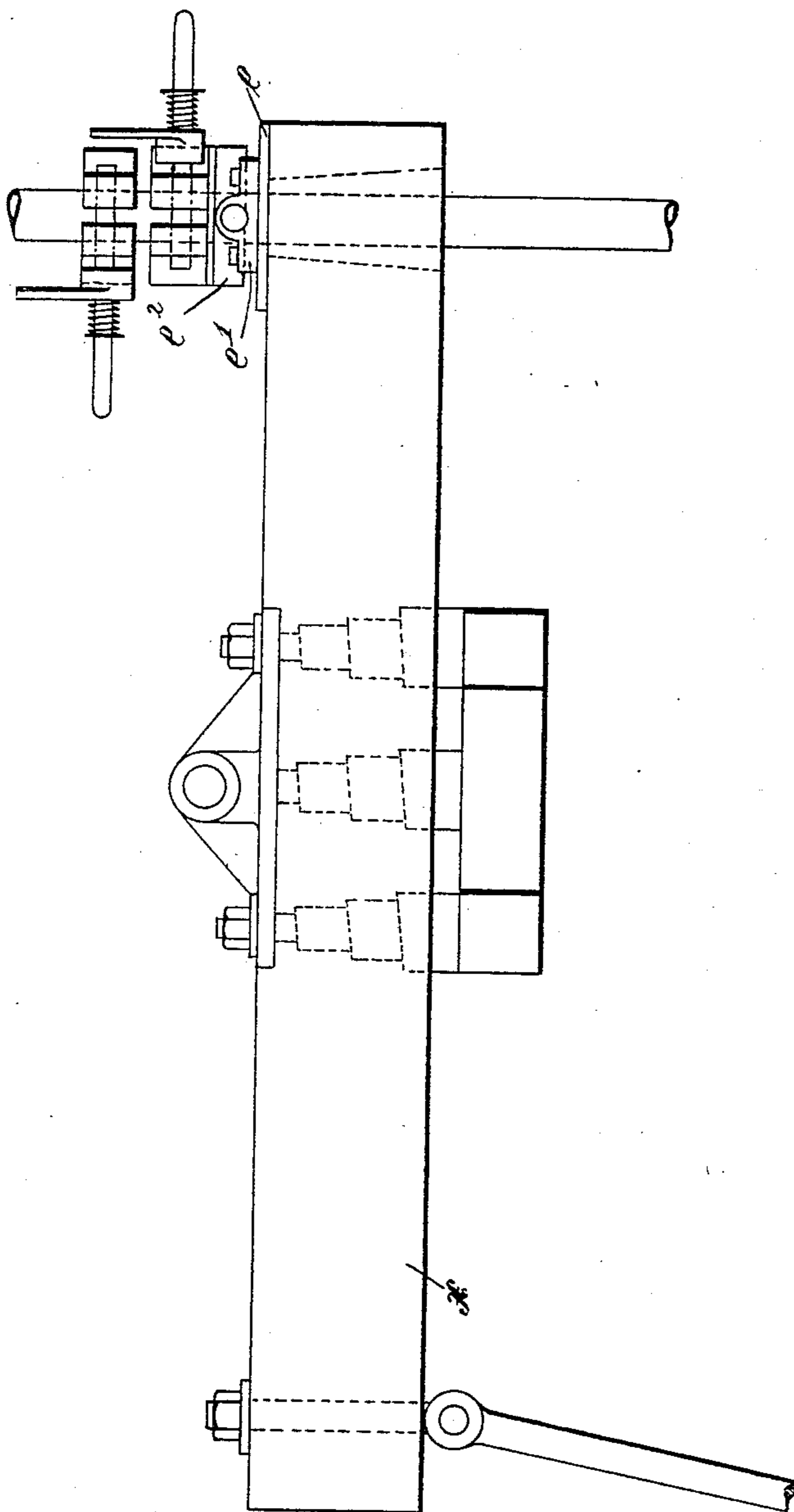
LOWERING DEVICE FOR RODS OF BORING APPARATUS.

(No Model.)

(Application filed Apr. 10, 1897.)

3 Sheets—Sheet 1.

Fig. 1.



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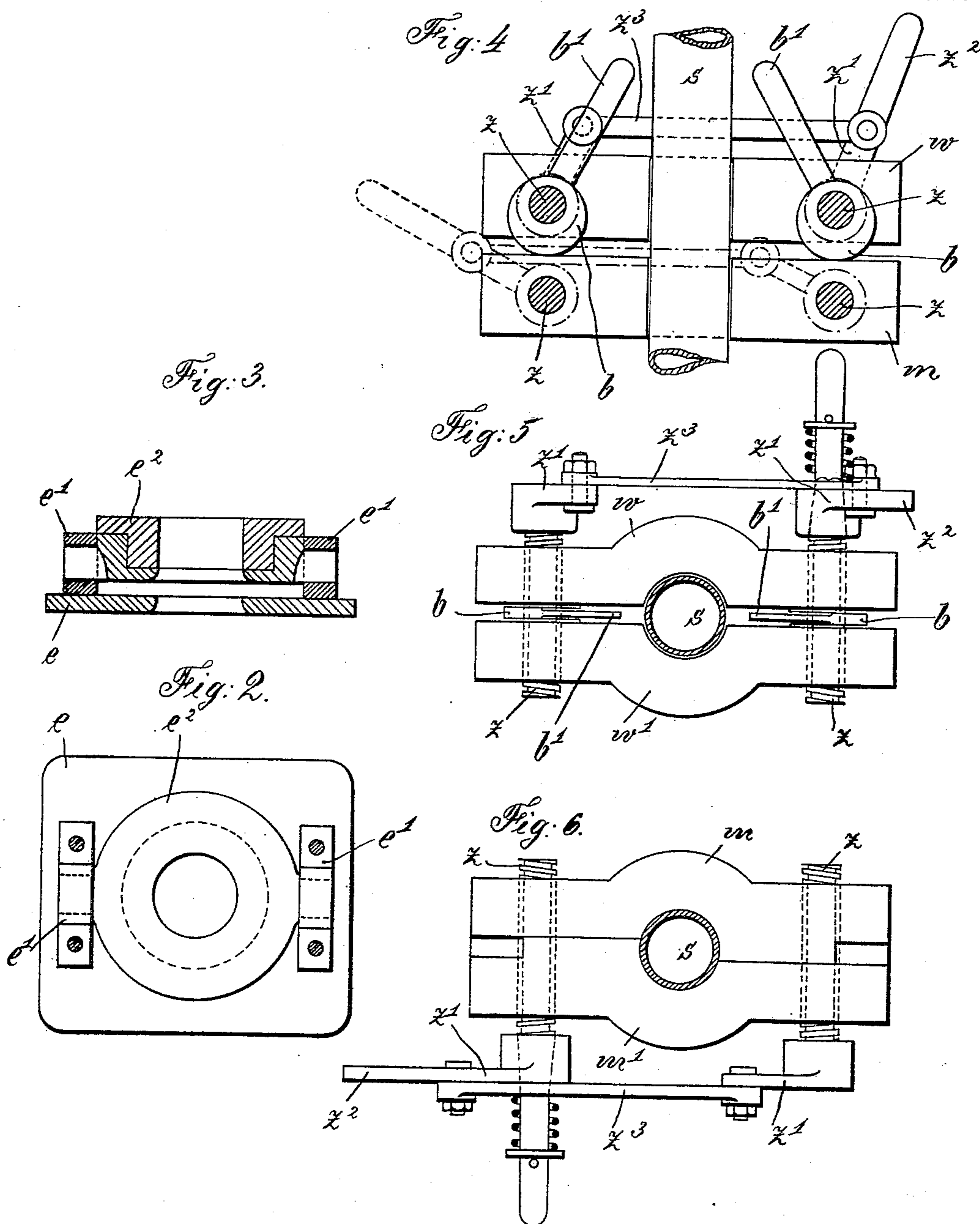
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(No Model.)

(Application filed Apr. 10, 1897.)

3 Sheets—Sheet 2.



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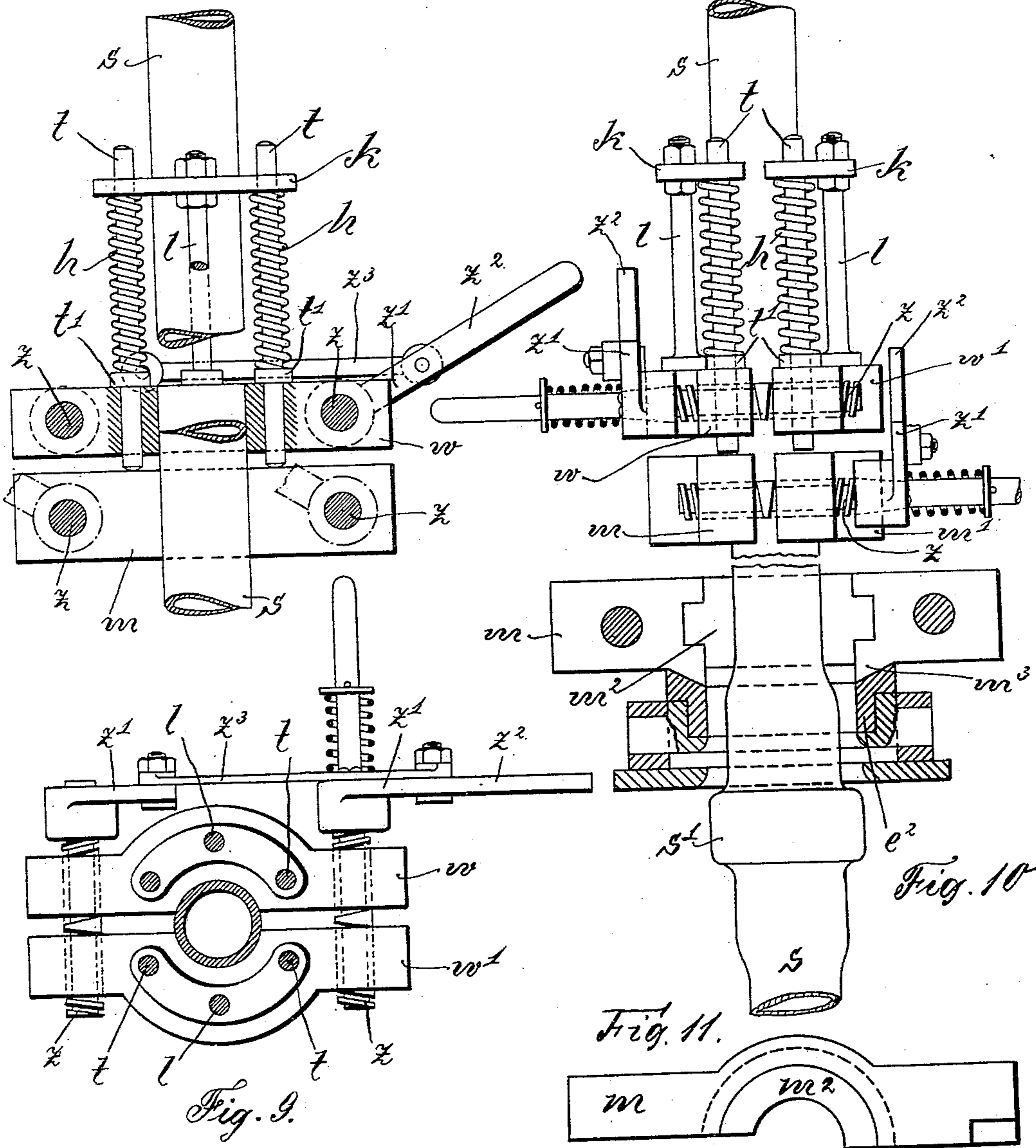
(Application filed Apr. 10, 1897.)

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(No Model.)

Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

ANTON RAKY, OF RUPPRECHTSAU, GERMANY.

LOWERING DEVICE FOR RODS OF BORING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 616,586, dated December 27, 1898.

Application filed April 10, 1897. Serial No. 631,610. (No model.)

To all whom it may concern:

Be it known that I, ANTON RAKY, a subject of the King of Prussia, German Emperor, and a resident of Rupprechtsau, near Strasburg, in Alsace, in the German Empire, have invented certain new and useful Improvements in Lowering Devices for the Rods of Boring Apparatus, (for which patents have been obtained in France, additional patent to No. 231,671, dated July 18, 1896; in Belgium, [additional patent to No. 105,682,] No. 122,567, dated July 18, 1896; in Austria, No. 2,982, Vol. 46, dated July 24, 1896; in Great Britain, No. 17,553, dated August 8, 1896; in Hungary, No. 7,037, dated July 30, 1896; in Canada, No. 56,092, dated June 2, 1897, and in Italy, No. 63, Vol. 88, dated July 30, 1897,) of which the following is an exact specification.

The means for lowering the rods according to the progress of the boring consisted up to now either of a screw-threaded spindle or of a chain intercalated between the boring-rods and the oscillating beam transmitting the power of the engine or motor of the plant to said rods. The spindle, as well as the chain, could have but a limited length, (about one meter.) If, therefore, the boring-rods had been lowered for said length, then the motor or engine had to be stopped or had to be uncoupled from the apparatus, so as to allow of the insertion of a short piece of rod between the boring-rods and said spindle or chain and of again raising the latter, according to the length of said piece of rod.

The purpose of my invention is to do away with the loss of time and money caused by the stopping of work, and I attain that object by enabling the apparatus to work uninterruptedly—that is to say, to work at least as long as is necessary for deepening the bore-hole for the length of a boring-rod proper, (about five meters.)

In carrying my invention into effect I make use of two clamps or pairs of clamping-cheeks, respectively, that are arranged upon the boring-rod one over the other. The lower of said clamps is carried directly or indirectly by the beam, and the upper clamp is carried directly or indirectly by the lower one. The upper clamp may be displaced along the bor-

ing-rod, and the lower clamp allows of the boring-rod being displaced along or within it. Each clamp may be coupled with or uncoupled from the boring-rod, and said coupling and uncoupling are alternately or reciprocally effected in such a manner that an intermittent lowering of the boring-rod results. Prior to each lowering of the boring-rod the upper clamp is lifted off the lower one by a mechanical means of any appropriate construction—for instance, such ones as are described as examples in the further course of the present specification. Irrespective, however, of the special construction of the lifting means or of the arrangements of its parts, respectively, the coöperation of the two clamps with each other, as well as with the boring-rods, is as follows: If all parts of the apparatus are in their normal state or if the apparatus is at work, the lower clamp is firmly connected with the rods, so that the latter are carried by the beam that transmits the motion of the motor or engine to said rods and transforms the rotary motion of the motor into a reciprocating one. When the rods are to be lowered, the upper clamp is lifted off the lower one and is then firmly connected with the respective rod. Thereafter the lower clamp is disconnected from the rod. The latter is now held not by the lower clamp, but by the upper one. The rod or rods may thus be lowered for a length corresponding to the distance between the two clamps, and I prefer to let said lowering be effected by the same means as used for lifting the upper clamp off the lower one. After the rods have been lowered the respective upper rod is again connected with the lower clamp, and the upper clamp may then be disconnected from said rod and lifted again off the lower one and remain in its higher place until it is again coupled to the rod for lowering this latter.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 is a side view of an oscillating beam of a boring apparatus for deep borings, the means for supporting the supports proper of the beam and for oscillating the latter be-

ing left away and one end of the beam being furnished with the lowering device forming the subject-matter of the present invention. Fig. 2 is a plan of a plate and a ring forming the supporting parts for said lowering device. Fig. 3 is a vertical section through said parts. Fig. 4 is a side view of two superposed clamping-cheeks, each of the latter being one of the two superposed clamps spoken of. Fig. 5 is a plan of the lower clamp. Fig. 6 is a plan of the upper clamp. Fig. 7 is a view similar to Fig. 4, but showing a modified form of construction. Fig. 8 represents the form of construction shown in Fig. 7 when turned for ninety degrees, and Fig. 9 is a plan of the upper clamp of the other form of construction. Fig. 10 is a view similar to a combination view of Figs. 3 and 4, but showing a slightly-modified form of construction; and Fig. 11 is a plan of the clamp shown in Fig. 10.

Referring to Figs. 1, 2, and 3, e is a plate which is arranged upon the free end of the oscillating beam x and is provided with bearings e' , holding a ring e^2 . The latter supports the two clamps aforementioned.

In the form of construction shown in Figs. 4, 5, and 6 the lower clamp consists of the two cheeks $m m'$, Fig. 6, and the upper clamp consists of the two cheeks $w w'$, Fig. 5. The two cheeks of either clamp may be moved against and from each other by means of screw-threaded spindles z , that are provided with a right-hand thread as well as with a left-hand one. Each of said spindles is provided with a crank z' , and the two cranks belonging to one clamp are connected by a bar z^3 , so as to allow of the simultaneous operation of both said cranks. One of the latter is furnished with or formed into a handle z^2 .

To lift the upper clamp off the lower one, I make use of eccentric disks b , Figs. 4 and 5, located between the two cheeks of one of the clamps and arranged loosely upon the spindles of the same. Each of said disks is furnished with a handle b' . If the parts $b b'$ are in the position shown in Fig. 4, the upper clamp is in its highest position. If now said upper clamp is connected with a rod s and if thereafter the connection of the lower clamp with said rod is broken, the upper clamp (and with it the rod s or the boring-rods, respectively) may be caused to get down upon the lower clamp by turning the eccentric disks b for one hundred and eighty degrees. When this has been done, the lower clamp is again fixed to the rod s and the upper clamp is again lifted by turning the eccentric disks in a reverse way, so that all parts in question receive again the position shown Fig. 4.

In the form of construction shown in Figs. 7, 8, and 9 lifting the upper clamp is effected by means of spiral springs h , that are arranged upon pins t . The pins t are held and are kept in proper position by the cheeks of

the upper clamp, but they sit loosely in said cheeks and are supported by the cheeks of the lower clamp. The cheeks of the upper clamp may therefore be moved along said pins t , and they can be moved either down upon the cheeks of the lower clamp or up against the collar t' of the said pins. There are two pins t held by each cheek of the upper clamp, and two pins of each cheek are connected by a traverse k , that may be displaced along the pin. Said traverses are supported by the springs h , and each of the same holds a bolt l , which holds in its turn a cheek of the upper clamp. It is therefore to be seen that the upper clamp, when in its upper position, is supported or held by the springs h , so that these latter will be compressed or put under tension as soon as the upper clamp is caused to get down upon the lower one. This occurs when the rod s is connected with the upper clamp and disconnected from the lower one, as will be clear without a further explanation. Thereafter the lower clamp is again fixed to the rod s , and the upper clamp is uncoupled from the same. The upper clamp is then automatically lifted by the springs h , when all the parts are again in the position shown in Fig. 7.

In the modified form of construction shown in Figs. 10 and 11 the center portion of the cheek m of the lower clamp forms a separate piece m^2 , that may be removed from or inserted into said cheek or may be exchanged for another similar piece of a greater or smaller size or with a greater or smaller opening, respectively. Of course each of the four cheeks of the device is furnished with such a removable or exchangeable piece, and by making use of the same I am enabled to employ one and the same pair of cheeks or one and the same clamp or lowering device, respectively, for rods of different diameter.

I prefer to let the central opening or bore of the ring e^2 correspond with the largest possible diameter of the central space of the clamps, and I prefer, further, to let said space and said bore be as large as to allow of the passing through of the connecting-sockets s' of the rods. To obtain a constantly correct position of the lower clamp upon the ring e^2 , I prefer to let each cheek of said clamp have a downwardly-extending semicircular projection m^3 of triangular section. These projections take into a correspondingly-shaped cavity of the ring e^2 , as distinctly shown in Fig. 10.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States is—

In a boring apparatus for deep borings, having the rods held by a lowering device consisting of two clamps arranged one above the other upon one of the boring-rods and being adapted to be fixed to, loosened from, and displaced along the same, the combination

with said clamps of eccentric disks located
between the cheeks of one of the clamps and
arranged loosely on spindles fastened to said
clamps, and with handles for turning said
5 eccentric disks, the latter being supported
by the lower clamp, as set forth.

In testimony whereof I have signed this

specification in the presence of two subscri-
ing witnesses.

ANTON RAKY.

Witnesses:

GUSTAV TAUBE,

WILLIAM ESSENWEIN.