No. 696,480. Patented Apr. 1, 1902.

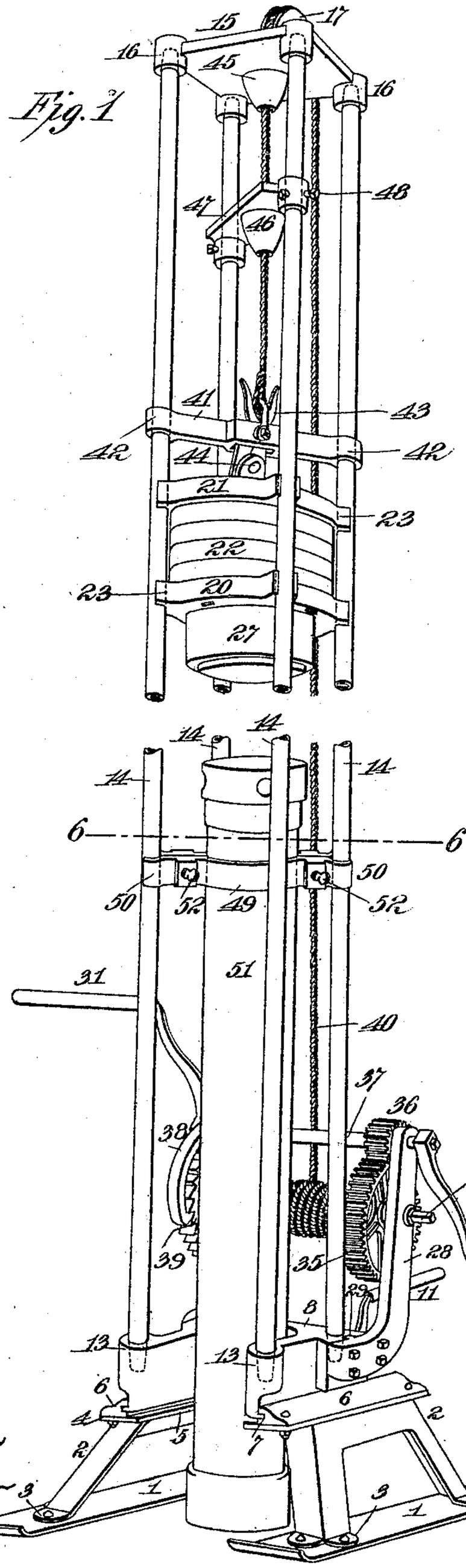
C. D. PIERCE.

PORTABLE TUBULAR WELL AND TEST BORING MACHINE.

(Application filed Oct. 17, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1



Witnesses:

Jas. F. Coleman

Ina Abbitt Taylor

Inventor

Charles A. Pierce

by

Byrne Edmonds & Byrne

Attorneys

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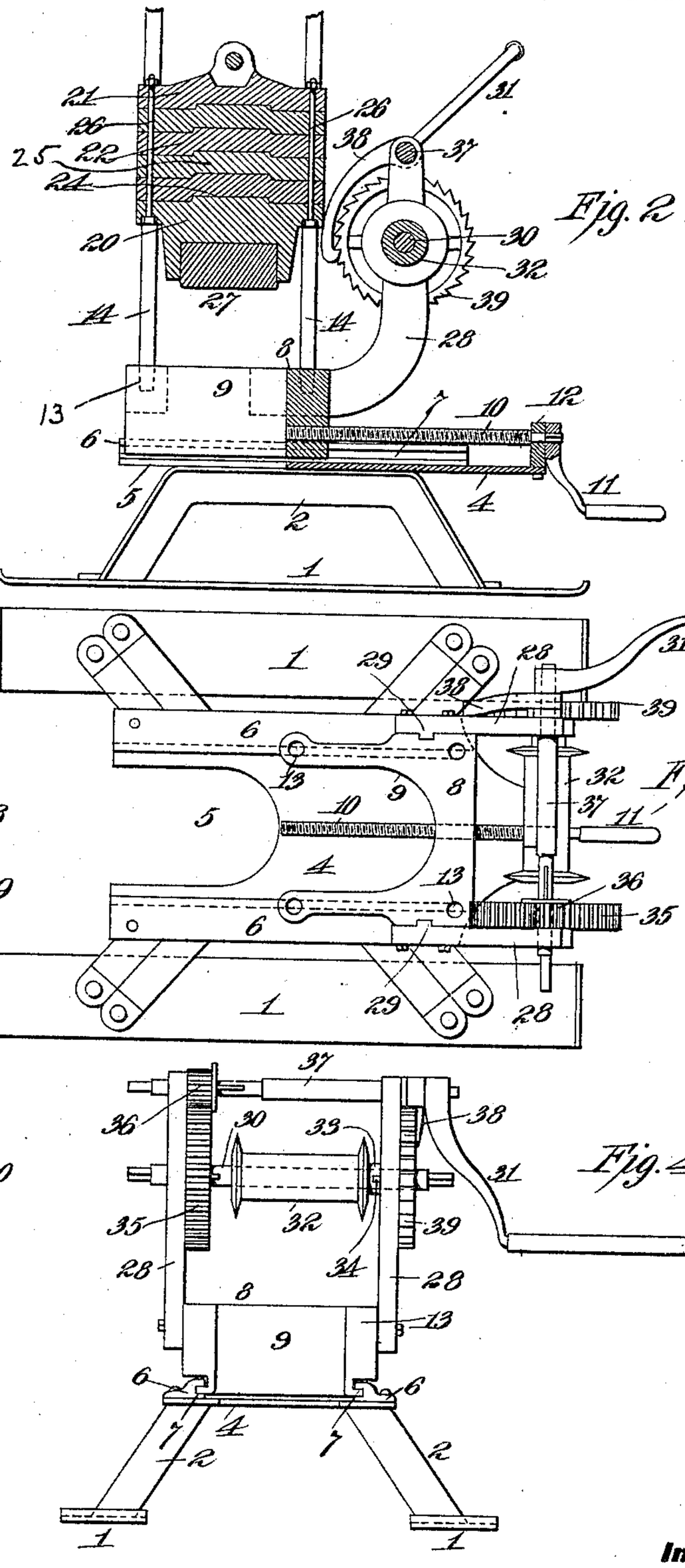

Fig. 2.

Fig. 3.

Fig. 5.

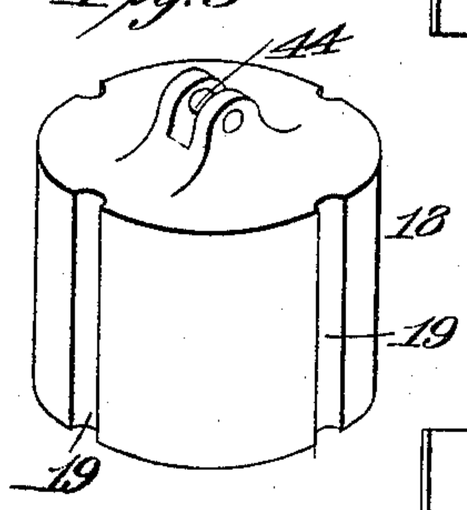

Fig. 6.

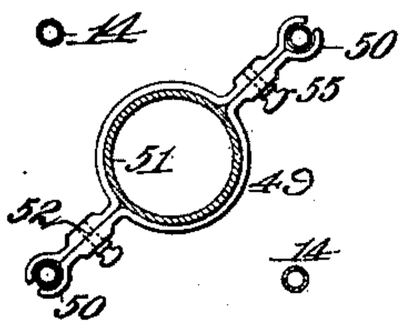

Fig. 4.

Witnesses:

Jas. F. Coleman

Jno. Robt Taylor

Inventor

Charles A. Pierce

by Ryan Edmonds & Ryan

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES D. PIERCE, OF JERSEY CITY, NEW JERSEY.

PORTABLE TUBULAR WELL AND TEST BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 696,480, dated April 1, 1902.

Application filed October 17, 1901. Serial No. 78,940. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DENIO PIERCE, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improved Portable Tubular Well and Test Boring Machine, of which the following is a description.

My invention relates to a small tubular well and test boring machine which is of such a construction as to be readily portable and which has been especially designed for making test borings, soundings for foundations, bridge approaches, street-fillings, sewers, &c., exploring for bed-rock, and prospecting for minerals, asphaltum, phosphates, clays, &c. The improved machine may, however, be employed for any purpose for which tubular well-boring machines are now used or for which test-boring machines are employed.

My object is to provide a machine for the purpose which shall be simple in construction, effective in use, sufficiently small as to be readily portable, and capable of being easily knocked down and assembled to facilitate transportation.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a perspective view of my improved machine in its preferred form, illustrating the apparatus in operation for driving a pipe; Fig. 2, a side elevation of the machine; Fig. 3, a plan of the main or foundation elements of the machine with the standards and parts carried thereby removed; Fig. 4, a rear view of Fig. 3; Fig. 5, a perspective view illustrating a modification of the construction of the ram, and Fig. 6 a section on the line 6 6 of Fig. 1.

In all of the above views corresponding parts are represented by the same numerals of reference.

1 1 represent two sheet-metal skids, preferably turned up at the ends, as shown in Figs. 1 and 2, in order to permit easy transportation, and from each of which extends an arch 2, made, preferably, of angle-iron, as shown, the ends of the legs of each arch being turned horizontally to form feet 3, which are riveted or bolted to the skids 1. Carried by the arches 2 2 and bolted or riveted rigidly to the same is a plate 4, having a cut-away portion 5. (See Fig. 3.) Secured to the plate 4 at each side and above the horizontal members of the arches 2 is a cast guide 6, formed with a way 7 therein, which is suitably cut by a planing-machine. Mounted in these ways is a casting 8, forming the adjustable bed of the machine. This casting (see Fig. 3) is also cut away at 9, and when moved to its normal position the cut-away portions 5 and 9 will substantially coincide. Horizontal adjustment of the bed 8 is effected by an adjusting-screw 10, operated by a handle 11. This adjusting-screw passes through an eye 12, secured to the plate 4, the shank of the screw being reduced, as shown, so as to prevent movement of the screw toward said eye. Movement of the screw in the other direction is obviously prevented by the handle 11, whereby the bed 8 may be moved horizontally with respect to the plate 4. The bed 8 is provided in the preferred instance with four sockets 13, slightly tapered internally, and fitting into each of these sockets is a pipe 14, extending vertically, as shown, and the four pipes together constituting a skeleton framework, in which the ram works, as will be hereinafter described. Instead of making use of pipes for this purpose it will be evident that solid rods may be employed. It will also be understood that the standards 14 may be supported in other ways than by the use of tapered sockets, and it will finally be obvious that instead of employing four standards, as described, a greater or less number may be made use of. I find, however, that by making use of pipes for the purpose maximum strength and rigidity are combined with a minimum weight, while by tapering said pipes at their lower ends and causing said tapered portions to engage sockets, as described, a construction will be secured which can be readily assembled and knocked down. At their upper ends the standards 14 are connected together by a plate 15, having, preferably, tapered sockets 16, which fit the tapered upper ends of said standards, so that said plate will be readily removable when desired. The plate 15 also carries a pulley 17, over which runs the line for operating the ram.

Movable vertically between the standards 14 is the ram before referred to, and which

may be either of the construction shown in Fig. 5, wherein the ram is formed of a single heavy casting 18, having vertical grooves 19 in its side, in which the standards 14 engage, so as to guide the ram in its movements, or instead the ram may be and preferably is of the special construction shown in Figs. 1 and 2. With this preferred construction the ram comprises a bottom section 20, a top plate 21, and intermediate removable sections 22. The top and bottom plates 20 and 21 are formed with ears 23, with which the standards 14 engage, so as to guide the ram in its vertical movement. The lower section 20 is formed with an extension 24, fitting a recess in the section 22 immediately above, and the latter section is provided with an extension 25, fitting a corresponding recess in the immediately-superposed corresponding section, and so on, whereby all the sections of the ram will be locked together. Tie-bolts 26 extend through all the sections of the ram, so that the latter practically constitute a solid element, having the advantage, however, of being sectional, so that its weight can be readily increased or diminished by increasing or diminishing the number of the intermediate sections 22, and permitting also the employment of sections which can be readily transported. Preferably the lower section 20 of the ram is provided with a block 27 of hard wood driven in place to prevent injury to the steel drive-head which is being operated upon. Secured to the bed 8 are two arms 28, held in place by bolts, as shown, (see Fig. 3,) and each arm being formed with a lug 29, engaging a corresponding recess in said bed. Mounted in the arms 28 is a shaft 30, having squared ends for receiving a handle 31. Loosely carried by the shaft 30 is a drum 32, which is laterally movable on said shaft. This drum is formed with a hub 33, having a recess which engages a stud 34 on the shaft 30, so that when said stud is in engagement with said recess the drum will be rotated from the shaft 30. By shifting the drum laterally, however, to disengage the lug 34 from said recess the drum can turn independently of the shaft. Preferably the shaft 30 carries a spur-gear 35, keyed thereon, and engaging said gear is a pinion 36 on a counter-shaft 37, the ends of which are also squared for receiving the handle 31 when desired. Loosely carried by the counter-shaft 37 is a pawl 38, the tooth of which coöperates with a ratchet 39 on the shaft 30 to prevent return movement of the latter. Passed around the drum 32 is a line 40, which extends up over the pulley 17 and is secured at its free end to a cross-piece 41, having eyes 42, which slide on diametric standards 14. The cross-piece 41 carries a pair of gripping-jaws 43, arranged to engage an eye 44 in the top of the ram, as shown, and which gripping-jaws are of the common and usual construction employed with pile-drivers and similar apparatus and need not, therefore, be described in detail. The jaws 43 will be automatically separated by engaging with a cam 45 on the plate 15 when the ram has been moved to its uppermost position. If desired, however, a cam 46 for this purpose may be carried on a plate 47, which may be locked to diametric standards 14 at any point of their length by set-screws 48, whereby the ram will be freed at any position of its travel.

For the guidance of the pipe or tool I prefer to use a two-part clamp 49, having eyes 50, which engage two of the standards 14, so as to move freely thereon, said clamp being tight on the pipe or tool 51 by means of bolts 52. (See Fig. 6.) As the pipe or tool descends under the action of the ram the clamp 49 will move with it relative to the standards 14.

In assembling the machine the skids 1 are moved to the desired locality. The standards 14 are now connected at one end by the plate 15, the line 40 is run over the pulley 17, and the cross-piece 41 and ram are both introduced over the standards, after which the latter are mounted in the sockets 13 of the base 8 by being moved to a vertical position.

In operation the jaws 43 will engage the ram and the crank 31 on the shaft 30 or counter-shaft 37 will be operated to rotate the drum 32 and elevate the ram until the jaws are released therefrom by engaging the cam 45 or 46, as the case may be. The ram therefore will drop by its weight, sliding on the standards 14 and striking the upper end of the pipe or tool to force the same downwardly. The drum 32 is then shifted to one side to disconnect the lug 34 from the recess in the hub 33, permitting the cross-piece 41 to unwind the line until the jaws again engage the ram for a further operation.

By making provision for the horizontal adjustment of the casting 8, carrying the standards 14 with it, I am enabled to delicately adjust the ram with respect to the pipe or tool being operated on, and it also is possible to shift the parts to the position shown in Fig. 3 to thereby move the standards 14 to one side of the pipe or tool, which can then be elevated by any suitable apparatus without interfering in any way with the ram or other parts of the apparatus.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a boring or drilling machine, the combination of a base having grooved ways in its upper part, a bed mounted to slide horizontally in said ways, the bed and base being provided with coincident cut-away portions, means for adjusting the bed with respect to the base, a plurality of standards carried by the bed and forming a vertical framework, and a ram movable vertically in said standards and in vertical line with the cut-away portion of the bed, substantially as set forth.

2. In a boring or drilling machine, the combination of a base having a cut-away portion

and formed with ways in its upper part, a bed mounted in said ways and movable horizontally therein, said bed being provided with a cut-away portion coincident with the corresponding portion of the base, means for adjusting the bed with respect to the base, a plurality of standards carried by the bed and forming a vertical framework, a ram vertically movable in said standards in line with the cut-away portion of the bed, and a winch carried by and movable with the bed for operating the ram, substantially as set forth.

3. In a boring or drilling machine, the combination of a base, a bed adjustable horizontally with respect to said base, means for adjusting the bed, a plurality of standards removably carried by the bed and forming a removable upright framework, a top plate removably carried by said standards at their upper end, a ram movable vertically in said standards, a winch carried by and adjustable with the bed, detachable connections between the winch and said ram, and a cam for detaching said connections adjustably mounted on and with respect to said standards, substantially as set forth.

This specification signed and witnessed this 3d day of October, 1901.

CHARLES D. PIERCE.

Witnesses:

JNO. ROBT. TAYLOR,

JOHN L. LOTSCH.