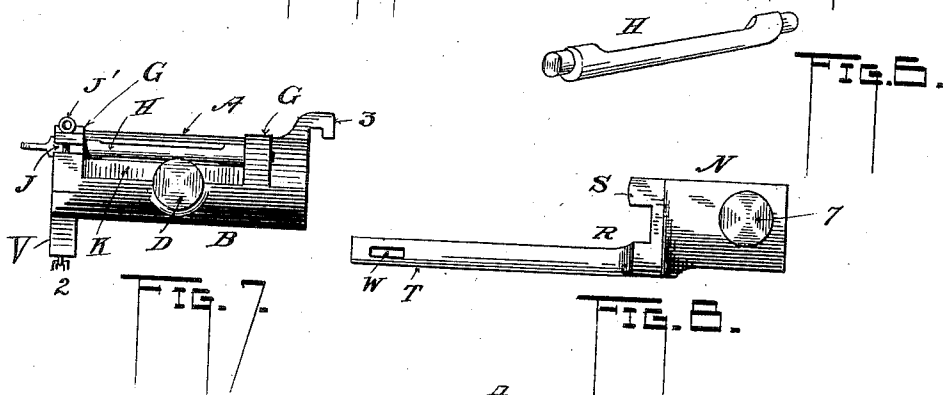
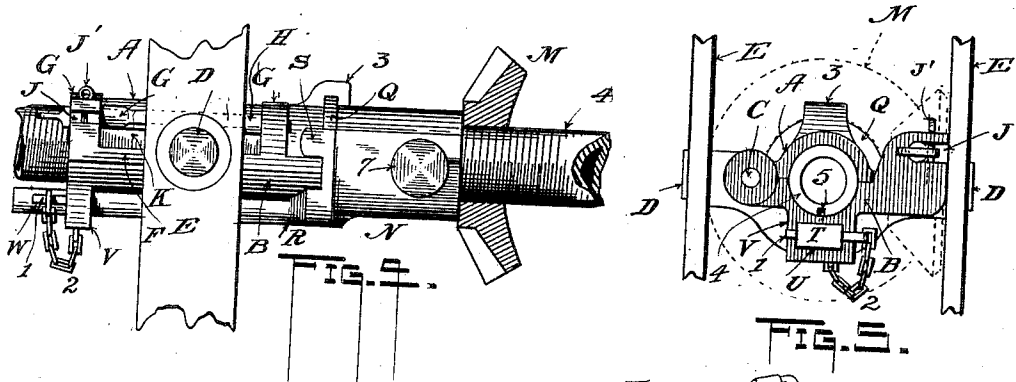
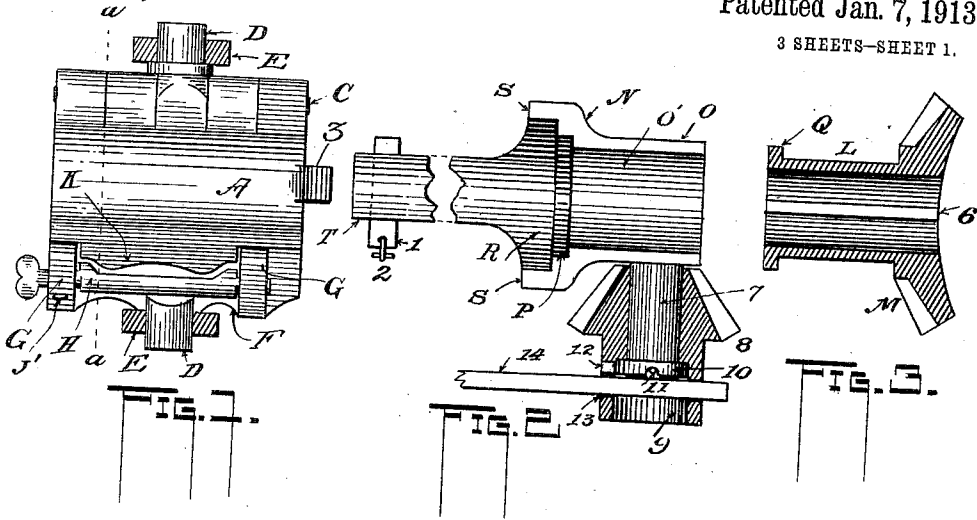


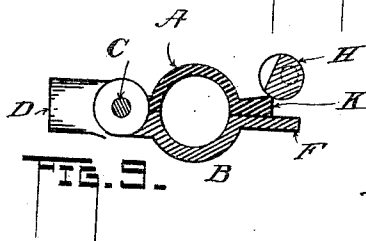
W. H. CLARKSON.
COAL DRILL.
APPLICATION FILED MAR. 16, 1908.

1,049,454.

Patented Jan. 7, 1913.
3 SHEETS-SHEET 1.



Witnesses:
Loretto White
Ladd Gray



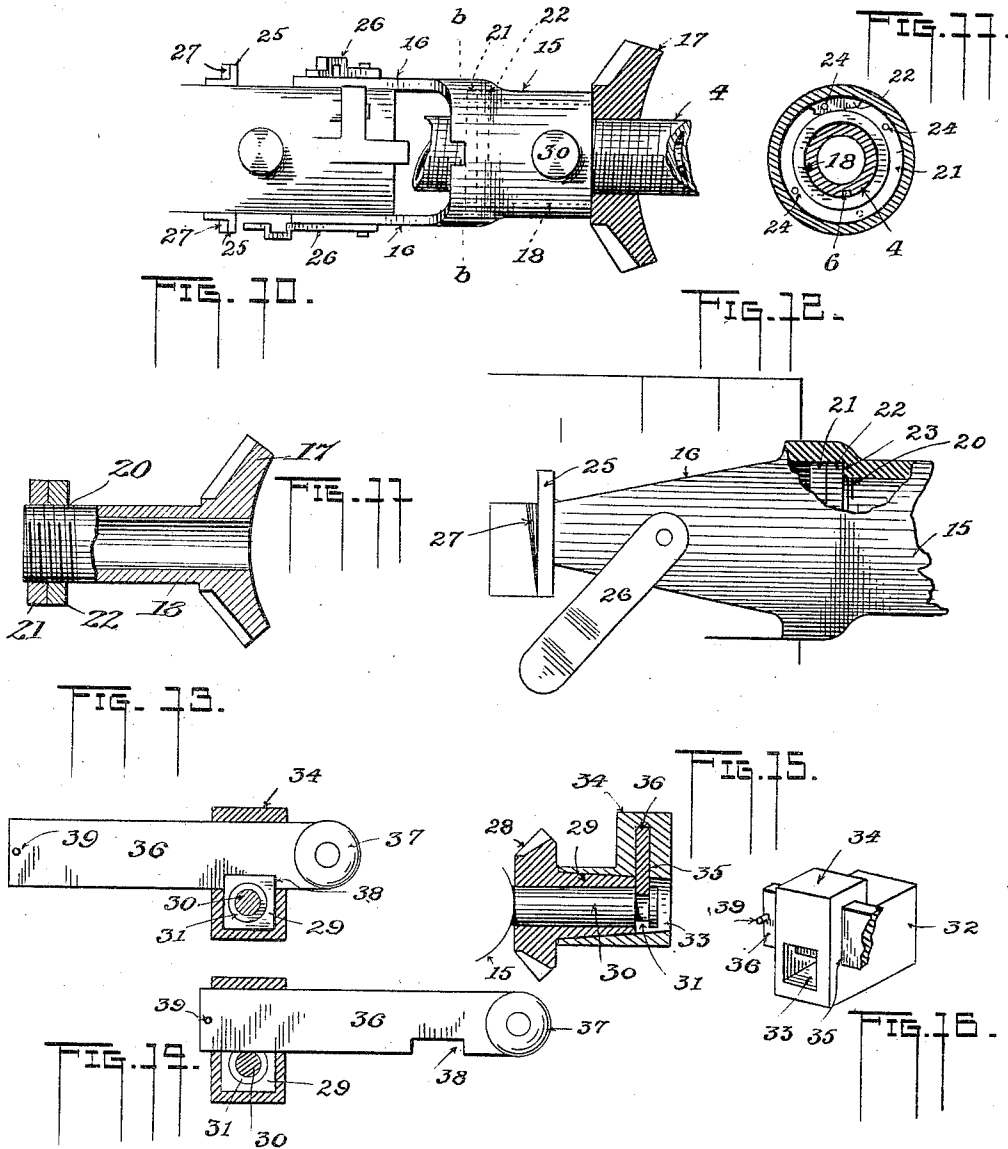
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3 SHEETS—SHEET 2.



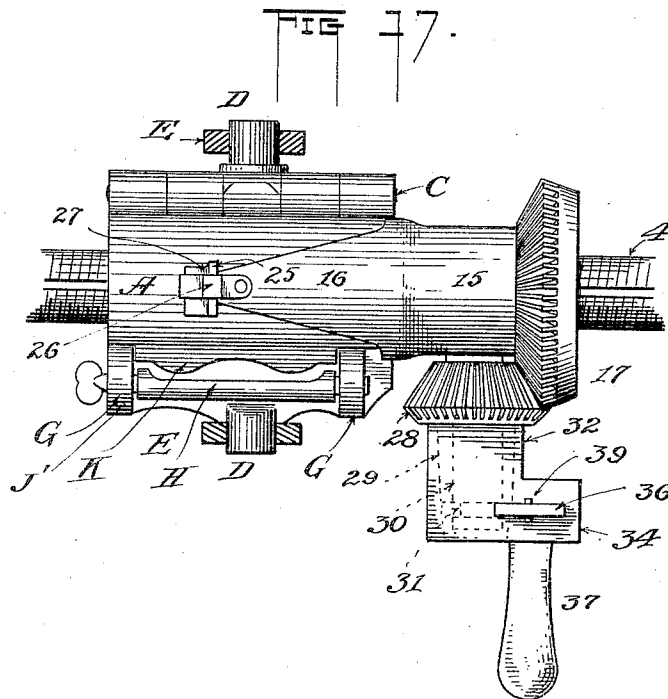
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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COAL-DRILL.

1,049,454.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed March 16, 1908. Serial No. 421,342.

To all whom it may concern:

Be it known that I, WM. H. CLARKSON, a citizen of the United States, residing at Edwards Station, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Coal-Drills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention pertains to coal drills and relates more particularly to a renewable boxing or feed nut for the same, and an interchangeable thread-bar driving device.

The primary object is to provide a simple boxing that can be detached from the other parts of the machine and renewed at a very small expense when rendered unfit for further service.

A further object is to provide mechanism in a coal drill consisting of several parts which can be readily assembled or taken apart for convenience and also that in renewing a part that may have been rendered unfit for further use, it may be replaced by another without the necessity of discarding the greater portion of the machine as is often the case.

In addition to the above the invention relates to certain details of construction as will be pointed out hereinafter and also made to constitute part of the claims.

It is well known that the boxing or feed nut when its threads become considerably worn must be replaced by a new one and, it is my purpose to construct a boxing simple in form and of light weight so that it may be replaced at a minimum of cost, and it is a further purpose to make said boxing interchangeable with the other parts of the drill mechanism so that no fitting is necessary in replacing the worn part. My construction is such, also, that it provides for the ready opening of the boxing for adjustment of the thread-bar to its work.

In the drawing forming part of this application, Figure 1 is a plan of the boxing as I construct it. Fig. 2 is a plan of a portion with which it engages. Fig. 3 is a longitudinal section of a beveled gear. Fig. 4 is a side elevation of the assembled parts shown in first three figures and showing, also, a portion of a supporting frame. Fig. 5 is a rear elevation of the same. Fig. 6 is

a perspective view of a locking device for the boxing. Fig. 7 is a side elevation of the boxing as viewed in Fig. 4. Fig. 8 is a side elevation of the member shown in Fig. 2 which receives the boxing in Fig. 7. Fig. 9 is a vertical cross section of the boxing and its locking member on line *a a*, Fig. 1. Fig. 10 is a side elevation of a modified form of the boxing support shown in Fig. 8. Fig. 11 is a transverse section of Fig. 10, taken on lines *b b*. Fig. 11' is a longitudinal section of the gear shown in Fig. 10. Fig. 12 is a plan of a portion of the boxing and support, drawn on a much larger scale, showing a latch. Fig. 13 shows a crank and certain parts with which it engages. Fig. 14 shows the crank in a different position. Fig. 15 is a vertical longitudinal section of a driving pinion and a stud for carrying it, the crank being shown in connection therewith. Fig. 16 is a perspective view of a fitting which carries the crank. Fig. 17 is a plan of the complete device of the form shown in Figs. 11 to 16.

The boxing or feed-nut comprises an upper and a lower portion A and B respectively, hinged at C in the usual manner, the lower member having horizontal extensions or trunnions D by which it is supported in the frame members E, all of which is well known. Said lower member at the side opposite the hinge has an extension F provided with vertically disposed lugs G one of which is drilled to receive the end of the cam H, the other being slotted as shown at J in Fig. 5 to receive the end of the cam which is slipped thereinto, said cam being positioned substantially as shown in Figs. 1, 4 and 7. A split pin J' or other suitable device is inserted in the lug vertically across the slot and adjacent to the cam whereby that member is positively held in place. The upper boxing section A has an extension K which lies upon the extension F of the lower section and which receives pressure from the said cam H as indicated in Fig. 9. In Fig. 1 the cam is thrown to the open position so that the upper section can be raised on its hinge but in Fig. 9 the cam is shown in its position to firmly lock the sections together. The said extension K, as shown in the figure last referred to is gradually thickened toward the edge so that when the cam is turned upon it the two serve to form a substantial and positive lock. However, the structure of

the cam is such that whether or not the part K is thickened as described, the locking action will result.

It is observed that the ends of the cam as carried in the bearings G are eccentric to the body portion of said cam, that is to say, the axes of said ends are not coincident with the central axis of the body. Now, evidently if the part K were even flat and sufficiently extended beneath the axes of the ends, while still able to clear the cam portion in the lifting movement of the boxing portion A, the said cam portion when swung to a position where it would be substantially beneath the axis of its ends it would naturally not only continually increase in its pressure upon the part K, but would finally reach a position where it would remain locked in place since the line of greatest eccentricity is carried nearer and nearer to a line extending through the axes of the ends and the point of contact of the cam and the said part K and pressure reacting upon the cam would not be sufficient to turn it in a backward direction.

Figs. 2, 4 and 8 show a member N which serves as a bearing for the sleeve L of the driving gear M shown in Fig. 3 and serves also to properly hold said gear with relation to the boxing. This member has a forward extension O grooved at O' to receive the said sleeve L and has a second groove at P to receive an annular flange Q on said sleeve L. Still another groove at R receives the curved under side of the lower boxing section B there being rearward extensions or overhanging lugs at S, Fig. 4, beneath which the said lower boxing section extends as shown in said Fig. 4. A rearward extension T extends through an aperture U in a depending lug V at the rear end of the boxing and a transverse slot W in the extremity of said extension T receives a wedge 1 which, for convenience, is attached to a part of the boxing as, for instance, by means of a chain 2 or other suitable means. It will be noted that as assembled in Fig. 4 the wedge is inserted in the hole W after the extension T has been passed through the said lug V. The wedge when snugly driven home serves to draw the member N and the boxing into firm engagement.

Upon the top of the boxing section A is an overhanging hook 3 adapted to engage the flange Q of the sleeve L. This member firmly holds the gear in position but permits it to freely revolve. The thread-bar indicated at 4, is provided with a groove or spline 5 and a feather 6 within the gear and its sleeve L engages it. The boxing B is threaded to receive said thread-bar and the latter is fed to its work in the customary manner, the feather 6 of the gearing serving to impart motion to the said thread bar, the latter moving through said gear as it performs its work.

When desired to change the position of the thread-bar with respect to the boxing, the cam H is moved to release the section A which is raised upon its hinge. This releases the bar and the gear both of which may be lifted out of their places. The bar is then shifted through the gear M to the desired position and the section A closed and locked. It may be stated, however, that the overhanging hook 3 of the section A need not be used necessarily since the thread bar by being firmly held by the boxing will itself firmly hold the sleeve L within its seat.

The simple construction of the boxing, which is made up entirely of castings, and merely threaded, is of low cost and when worn out can be discarded and in a moment or two a duplicate boxing can be placed in position and the cam in the discarded boxing can be removed by withdrawing the pin J and placed in the new one.

When releasing the thread bar as above described the parts are all free from one another except the boxing and the member N which are held relatively rigid by the wedge and the interlocking lugs S. The said member N is provided with a stud 7 at one side which carries a pinion 8 to mesh with the gear M, the pinion and gear being shown in juxtaposition in Fig. 5. Preferably the pinion, besides being bored to slip upon the stud, is counterbored at 9 and a collar 10 enters such counterbore to pass over the end of the stud, said collar being held in place by a pin 11 which extends through the stud behind it. The pin is no longer than the outer diameter of the collar so that the pinion may readily turn without interference therefrom, there being an aperture in the pinion at 12 through which the pin may be entered and withdrawn. Said pinion has an extension outside of the end of the stud and is provided with an opening 13 at diametrically opposite sides through which a handle 14 is passed to constitute a crank by which to impart motion to the thread-bar through the gear M as will be understood. The pinion is employed when the drill is being used in cramped positions and when desired the handle may be removed and placed upon the rear end of the thread bar in the rear of the machine, all of which is well understood.

It is evident that it is not necessary to be confined to the exact construction shown herein nor the particular manner of interlocking the various members since other ways may be adopted that will come within the spirit and intent of the invention.

Fig. 10 shows a modified form of the member N which, in the present case, is indicated by the numeral 15. This has an upper and lower extension 16 instead of but one, and is tubular in form, consisting preferably of a single casting as before. The

gear 17 corresponding with M in the other figures has the sleeve 18 without the fixed flange at its end. In lieu of said flange the end is provided with screw threads 20 as shown in Fig. 12, which is the preferred form, and after said sleeve has been inserted into the member 15 two rings 21 and 22 are separately inserted between the extensions 16 and placed in position upon the said sleeve, the ring 22 bearing against a shoulder 23 of said member 15 as shown in Fig. 12 and answering in the same capacity as the fixed flange Q just mentioned, followed by the ring 21 which constitutes a lock-nut. Said rings are provided with holes 24 by which they may be adjusted upon the sleeve, using for the purpose a "spanner-wrench" which, however, has not been shown as it is well understood, said wrench being inserted between the said extensions 16 in order to reach said rings. On the boxing are lugs 25 against which the ends of the extensions 16 are adapted to abut. Each lug 25 has a beveled face 27 with each of which a latch 26 engages when the boxing is seated in place in the manner shown. These latches 26 are pivoted on the member 16 and swing behind the lugs causing the boxing and the said member 16 to be drawn firmly together. As may be seen, said latches are provided with bends so as to pass over the tops of the lugs. By providing an upper and a lower rigid arm between which to slip the boxing a very rigid connection is assured.

The pinion is indicated in Fig. 15 by the number 28 and its hub in this case is irregular in cross sectional form and is indicated at 29 this being bored to slip upon the stud 30. The stud in this instance, as shown in Fig. 15, is provided with an annular groove 31 and the end of the hub 29 lies flush with and terminates at said groove. In Fig. 16 is a member 32 having a socket 33 adapted to fit upon the said hub. This member has a right angled extension 34 provided with a transverse slot 35 extending substantially parallel to the plane of revolution of the pinion. In this slot is fitted a bar or arm 36, said arm being provided with a handle 37 to constitute a crank and near the handle 37 is a notch 38. When the notch is within the slot 38 the member 32 can be slipped upon the hub 29 to its working position so as to bring the arm 36 in line with the annular groove 31 of the stud. The arm may now be shifted to draw its edge into the groove. This will hold the member 32 in place and the hub of the pinion bears upon the arm and the pinion is thereby held in positive engagement with the driving gear. As the arm is turned to impart movement to the pinion it travels within the said annular groove. This construction is simple and effective and the arm

can be shifted in the direction of its length so as to have more or less sweep, giving the operator any desired leverage. For convenience, a pin 39 in the end of the arm prevents it being withdrawn from the slot 35 and prevents separation of the member 32 and said arm when detached from the machine.

Having thus described my invention, I claim:

1. In a coal drill the combination with an internally threaded boxing and a thread-bar for the same, of a gear to impart movement to the thread-bar, a member having a bore to receive the hub of the gear and having also an enlarged recess rearward of the bore there being a shoulder at the rear terminus of the bore, the hub having a rear threaded extremity, a collar adjustable upon the hub within the recess, arms extending from the gear-carrying member and lying longitudinally of the boxing, means to secure one of the arms to the boxing, and a driving member to engage and drive the gear.

2. In a coal drill the combination with an internally threaded boxing and a thread-bar therein, of a tubular member of a single section having an arm to engage the boxing and also having an internal shoulder, means to secure the arm to the boxing, a gear to drive the thread-bar its hub lying within the member, and means on said hub to engage the shoulder of the said member, said means being adjustable on said hub and adapted to retain the gear in place.

3. In a coal drill the combination with an internally threaded boxing and a thread-bar therein, of a tubular member of a single section having an arm to engage the boxing, means carried by one of the last named parts to secure the arm to the boxing, said tubular member having a shoulder whose face is disposed in a plane substantially perpendicular to the axis of the bore, a gear to drive the thread-bar, its hub lying within the member, and means carried by and adjustable on the hub relative to the said shoulder and adapted for retaining the gear in place.

4. In a coal drill the combination with an internally threaded boxing and a thread-bar, of a tubular member of a single section having an arm to extend longitudinally of and engage the same, means carried by the arm to secure it to the boxing, a gear to drive the thread-bar and having a hub to lie within the member, the same having a threaded extremity, a collar adjustable on said extremity to retain the gear in place, a stud carried by the tubular member, and a pinion thereon to engage and drive the gear.

5. In a coal drill the combination with an internally threaded boxing, and a thread-

bar therein, of a tubular member, a gear
having a hub revoluble within the member
and adapted for driving the thread-bar,
means adjustable on the gear to retain it
5 in said member, arms on the member lying
longitudinally of the boxing, a member se-
cured to and carried by one of the last
name portions, and means on one of said
portions with which it engages to secure the
10 tubular member rigid relative to the boxing.

6. The combination with a coal drill box-
ing and a member having a bore, the parts
adapted to be rigidly associated, of a gear

adapted to seat against one end of the mem-
ber and having a hub to fit the bore of the 15
same, said member having a second larger
bore, and an adjustable collar on the rear
end of the hub adapted to lie in said second
bore and adapted to bear upon the shoulder
created between the two said bores.

In testimony whereof I affix my signa- 20
ture, in presence of two witnesses.

WILLIAM H. CLARKSON.

Witnesses:

L. M. THURLOW,

ELUIDE JESSIE CLARKSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."