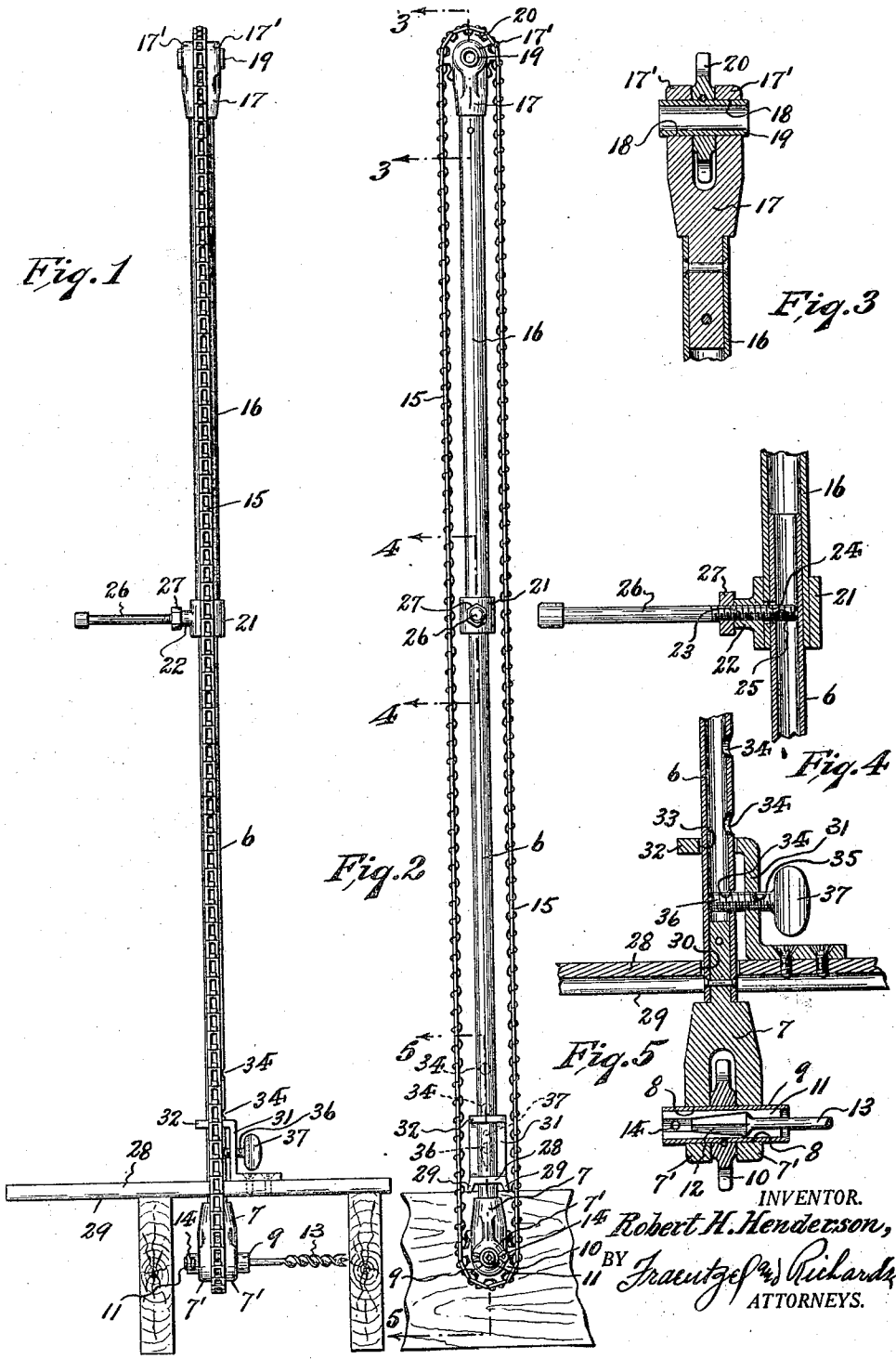


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R. H. HENDERSON
FLOOR JOIST BORING MACHINE

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FLOOR-JOIST-BORING MACHINE.

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To all whom it may concern:

Be it known that I, ROBERT HALSEY HENDERSON, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Floor-Joist-Boring Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates, generally, to improvements in collapsible hand driven machines for boring joists for electric light wiring, and particularly to that class of machines which are used for boring joists, beams, sleepers or the like located below the floor level.

It is the object of my present invention to provide a light weight portable and collapsible floor joist or beam boring machine especially constructed and designed to perform the boring operations so as to produce straight and true horizontal holes, and so as to render the same not alone easily manipulated but also easily controlled and handled while the workman stands in an easy and comfortable position.

My invention has for a further object to provide a novel arrangement and construction of supporting bar having a novel clamp device for adjusting the bit carrying standard and operating elements so that holes may be bored at various selective distances below the floor line, while at the same time always maintaining a proper alinement of the supporting or foot bar relative to the bit; and, furthermore, I provide a novel hand-grip device in connection with the standard, which also serves to interlock the telescopic sections of the latter in operative extended relation one to the other, while at the same time determining the proper extended position and adjustment of said sections whereby the drive chain is maintained in true and straight running alinement at a proper tension.

Other objects of this invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the same.

With the various objects of my present

invention in view, the same consists, primarily, in the novel construction of floor joist or beam boring machine hereinafter set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, all of which will be hereinafter more fully described, and then finally embodied in the appended claims.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of the collapsible floor joist or beam boring machine arranged in extended operative position, the same being made according to and embodying the principles of this invention.

Figure 2 is a rear elevation of the same.

Figure 3 is a fragmentary central longitudinal section drawn on an enlarged scale, and taken on line 3—3 in said Figure 2; Figure 4 is a fragmentary central longitudinal section drawn on an enlarged scale, and taken on line 4—4 in said Figure 2; and Figure 5 is another fragmentary central longitudinal section also drawn on an enlarged scale, and taken on line 5—5 in said Figure 2.

Similar characters of reference are employed in all of the hereinabove described views, to indicate corresponding parts.

Referring now to said drawings, the reference character 6 indicates a lower tubular column or standard section, to the lower end of which is fixed a bifurcated bearing yoke 7, the arms 7' of which are provided with bearing openings 8 in which is journaled a hollow shaft or sleeve 9. Fixed on said hollow shaft or sleeve 9 in any suitable manner, and disposed in the space between the arms 7' of the bearing yoke 7, is a sprocket wheel 10. Inserted within said hollow shaft or sleeve 9 is a split chuck-sleeve 11, made in two semi-cylindrical longitudinal sections, and adapted to conform to and embrace the butt 12 of a boring bit or auger 13 which projects outwardly from the end of the said shaft or sleeve. Said chuck-sleeve 11 is secured against withdrawal from said shaft or sleeve 9, and is at the same time connected therewith to receive therefrom and thus impart to said boring bit or auger 13 operative rotary motion, by means of a transverse cotter-pin or key 14. Running over said sprocket wheel 10 is an endless link belt or drive chain 15.

The reference character 16 indicates an upper tubular column or standard section, which is telescopically slidable over the upper end of said column or standard section 6. Fixed in connection with the upper end of said column or section 16 is a bifurcated bearing yoke 17, the arms 17' of which are provided with bearing openings 18 in which is journaled a shaft or sleeve 19. Fixed on said shaft or sleeve 19 in any suitable manner, and disposed in the space between the arms 17' of said bearing yoke 17, is an idler sprocket wheel 20. The upper loop or end of said link belt or chain 15 runs over and is guided by said idler sprocket wheel 20. Since by virtue of the construction above described, the standard, consisting of the members 6 and 16, the sprockets 10 and 20 and the chain 15 all occupy a common plane, it will be apparent that, in operation, the standard more steadily sustains the stress of the chain, and likelihood of tilting of the standard out of desired perpendicular position, when operating the device, is minimized.

Associated with the cooperating ends of said columns or standard sections 6 and 16 is a combined hand-grip device and lock clamp serving to interlock said columns or standard sections together in operative extension, whereby the same are secured against accidental collapse when the machine is in use, and which further serves to automatically aline and longitudinally space the sprocket wheels carried by the respective sections so that the drive chain 15 will run straight and true at a proper tension. Said combined hand-grip and lock clamp comprises a sleeve or ferrule 21 fixed upon and surrounding the lower extremity of said upper column or standard section 16. Said sleeve or ferrule 21 is provided on its rear side or face with a lateral boss 22 having an interiorly screw-threaded opening 23 extending therethrough, and an opening 24 registered with the inner end of the threaded opening 23 is provided in the wall of said column or standard section 16. The wall of said lower column or standard section 6 is provided, at one side adjacent to its upper extremity, with an opening or eye 25, which, when said upper column or standard section 16 is raised to extended operative position, is brought into alignment with the threaded opening 23 of said boss 22. The reference character 26 indicates a laterally projecting hand grip member, the inner end of which is externally screw-threaded to screw into the threaded opening 23, and when said opening or eye 25 is properly positioned in alignment with said threaded opening 23, the inner end of said hand grip member may be screwed inwardly to pass its inner extremity

through said opening or eye 25 and thus into binding or holding relation to said lower section 6 by engaging the inner surface of the wall of the latter at a point diametrically opposite said opening or eye 25, thus locking the two standard sections 6 and 16 together in operative extended relation against accidental collapse, and with their respective bearing yokes disposed to properly longitudinally space and aline the sprockets associated therewith so that the drive chain will run straight and true thereover at a desired predetermined tension. This method and means of interlocking the standard sections together being substantially in accordance with the principles and structure covered by my prior United States Letters Patent for overhead boring machines, issued August 22nd, 1922, and numbered 1,426,476. In order to retain the hand-grip member from accidental loosening I provide on the threaded shank thereof a lock-nut which may be screwed home against the free end of said boss 22 when the parts are operatively arranged as above described. It will be noted that the hand-grip member will project rearwardly from the carrying standard at a point substantially midway between its ends when extended, and thus conveniently disposed to enable the operator to balance and control the bit carrying standard and associated parts when operatively utilizing the same.

Associated with the lower column or standard section 6, above the bearing yoke 7 and mechanism supported by the latter, is an adjustable supporting or foot bar 28 having depending flanges or runners 29 projecting from its longitudinal sides, which arrangement provides an arched conformation in cross-section, rendering the supporting or foot bar of comparatively light weight and yet extremely strong, and consequently adequate to support the weight of a workman utilizing the machine, as will later appear. Said supporting or foot bar is provided intermediate its ends with an opening 30 through which may upwardly extend said column or standard section 6. Secured upon said supporting or foot bar is a bracket member 31 adapted to project upwardly from the upper face of the former. Connected with the upper end of said bracket-member 31 is a horizontal arm or lug 32 which is spaced upwardly from and disposed parallel to said supporting or foot bar. Said arm or lug 32 is provided with an opening 33 vertically alined above the opening 30 of said supporting or foot bar, and through which may also upwardly extend said column or standard section 6. The lower portion of said column or standard section 6 is provided with a series of vertically alined and

spaced openings or eyes 34. Said bracket member 31 is provided with an internally screw-threaded opening 35 in which is threaded the shank 36 of a thumb or clamp screw 37. Said shank 36 of the clamp screw may be passed through a selected opening or eye 34 until its free end bites on the opposite inner side of the column or standard section wall, thus forcing said column or standard into bound relation to the supporting or foot bar to hold the same against vertical movement, and thus hold securely, in desired adjusted position beneath the supporting or foot bar, the boring bit mechanism. The selected vertical adjustment of the carrying standard relative to the supporting or foot bar, which is attainable by the above described mechanism, is desirable since it permits the boring bit to be variously positioned to bore holes through the joists or beams at different distances below the floor line. Such adjustability is desirable since it is frequently necessary to run several circuits in the same general location, in which case the holes for the respective circuits may be bored at different levels thus obviating the necessity for taking up any great area of flooring, all of which is of especial advantage when wiring old buildings in which it is desirable to disturb as little of the flooring as possible.

Owing to the fact that the holes or eyes 34 in the standard section 6 are disposed parallel to the supporting or foot bar, the clamp screw 37 when operatively engaged with said standard section 6 through one of said holes or eyes 34 will so position the section as to hold the supporting or foot bar and auger bit in parallel aligned relation one to the other, which is a very necessary condition for easy boring, for if the supporting or foot bar and auger bit are not in such parallel alinement, the bit tends to travel ahead in one diverging direction and the supporting or foot bar in another diverging direction which creates a tendency of the bit to bind or jam in the hole being bored.

Since the clamp-screw 37 bites against the inside of the standard section 6, opposite the operative hole or eye 34, it follows that the outside surface of the standard section 6 is not scarred from repeated tightening, and consequently all burs or scars on the outside of the standard section 6 tending to impede smooth and easy movement of the latter through the openings or passages 30 and 33 of the same and of said arm 32 of the bracket member 31 are avoided; and, furthermore, since the clamp-screw passes through the wall of the standard section 6, the latter is securely prevented from accidental slipping out of longitudinal adjustment (even if the clamp-screw is accidental-

ly loosened), which might result in damage caused by the bit head sliding or dropping down and breaking through the plastered ceiling of the rooms beneath in cases where the machine is being used in wiring operations in connection with old buildings.

It will be noted that the supporting or foot bar is not flat on its under side but possesses two runners (formed by the longitudinal flanges 29) which minimize the friction when moving the same forward across the joists or beams to feed the auger bit in operation.

In operating the machine, after adjusting the standard section 6 to position the auger bit at desired distance below the floor line, the supporting or foot bar is placed in bridging position over a pair of joists or beams to position the auger bit opposite the joist or beam desired to be bored, and the operator grasps the hand-grip 26 with the left hand while at the same time placing his left foot on the supporting or foot bar with the toe abutting the standard section 6. The operator steadies the carrying standard with the left hand and presses forward with the left foot to slide the supporting or foot bar forward to carry the point of the auger bit in engagement with the joist or beam to be bored. Due to the fact that the standard, sprockets and chain all occupy a common plane, the laterally offset handle affords the most convenient means for steadying the standard when starting in the bit in the manner described. The bit is then started by pulling down on the chain 15 with the right hand, thus rotating the bit and starting the same forward into the joist or beam. When the bit is thus fairly started the operator may remove his left hand from the hand-grip and apply the same to the opposite side of the chain pulling upwardly thereon, thus employing both hands to actuate the chain and rotate the bit while constantly pressing forward with the left foot to feed the latter forward during the boring operation. To finish the hole the hand-grip is again grasped as at first and forward pressure is applied by the hand and foot to force the bit through the joist or beam after the screw point of the bit has lost its hold. To back out the bit, the operator pulls rearwardly on the hand-grip with the left hand, at the same time reversing the revolution of the bit by pulling upwardly on the chain with the right hand. This method will drive out the bit quickly by means of the spiral twist of the bit, and ordinarily will require but one upward pull on the chain. From the above description it will be clearly apparent that the operator may easily and quickly control the machine at the critical starting and backing operations, and is at the same time enabled to use both hands to apply

power to the bit during the major portion of the boring operation, being assured by the novel arrangement of the supporting means that the bit will travel straight and true without jamming once the same is started.

I am aware that some changes may be made in the above described general construction and details of joist boring machine without departing from the scope of this invention as set forth in the foregoing specification and as defined in the appended claims. Hence, I do not limit my invention to the exact arrangements and combinations of the several devices and parts as described in said specification, nor do I limit myself to the exact details of the construction of the same as illustrated in the accompanying drawings.

I claim:—

1. In a device of the kind described, a carrying standard having axially alined bearing means at its upper and lower end, sprocket wheels respectively journaled in said bearing means, an endless drive chain running over said sprocket wheels, all whereby said standard, sprocket wheels and chain occupy a common plane, means for coupling an auger bit in driven relation to said lower sprocket wheel, a transverse supporting foot bar vertically adjustable on said carrying standard above said lower bearing means, means for locking said foot bar in desired adjusted upwardly spaced and longitudinally parallel relation to said auger bit, and said carrying standard having a rearwardly projecting hand grip member intermediate its upper and lower ends offset from the plane of said standard, sprocket wheels and chain.

2. In a device of the kind described, the combination with a carrying standard of a transverse supporting foot bar having an opening through which said carrying standard slidably extends, a bracket member fixed on said foot bar having at its upper end a

bracket arm spaced above and alined parallel with said foot bar, said bracket arm having an opening vertically alined with the opening of said foot bar to also permit the upward sliding extension of said carrying standard therethrough, said carrying standard having a series of vertically alined and spaced eyes in its wall adjacent to its lower end and, a clamp-screw threaded through said bracket member parallel to said foot bar to extend through a selected eye to force said carrying standard into clamped engagement with said foot bar and said bracket arm for the purposes described.

3. In a device of the kind described, a collapsible standard comprising a pair of telescopically associated tubular sections, a rotatable boring bit means having a driving sprocket fixed to the lower end of the lower section, a rotatable idler sprocket mounted on the upper end of the upper section, an endless drive chain running over and between said sprockets, a hand grip device having a threaded inner end in lateral threaded engagement with the meeting end of one section, the meeting end of the opposite section having an aligning eye in its wall through which the biting end of said hand grip device is passed into binding engagement with the inner surface of said section at a point opposite said eye to interlock said sections in operative extended and alined relation, a transverse supporting foot bar vertically adjustable on said lower section above said boring bit means, and means for locking said foot bar in desired adjusted upwardly spaced and longitudinally parallel relation to the bit of said boring means.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 27th day of February, 1923.

ROBERT HALSEY HENDERSON.

Witnesses:

FLORA MILLER,
GEORGE D. RICHARDS.