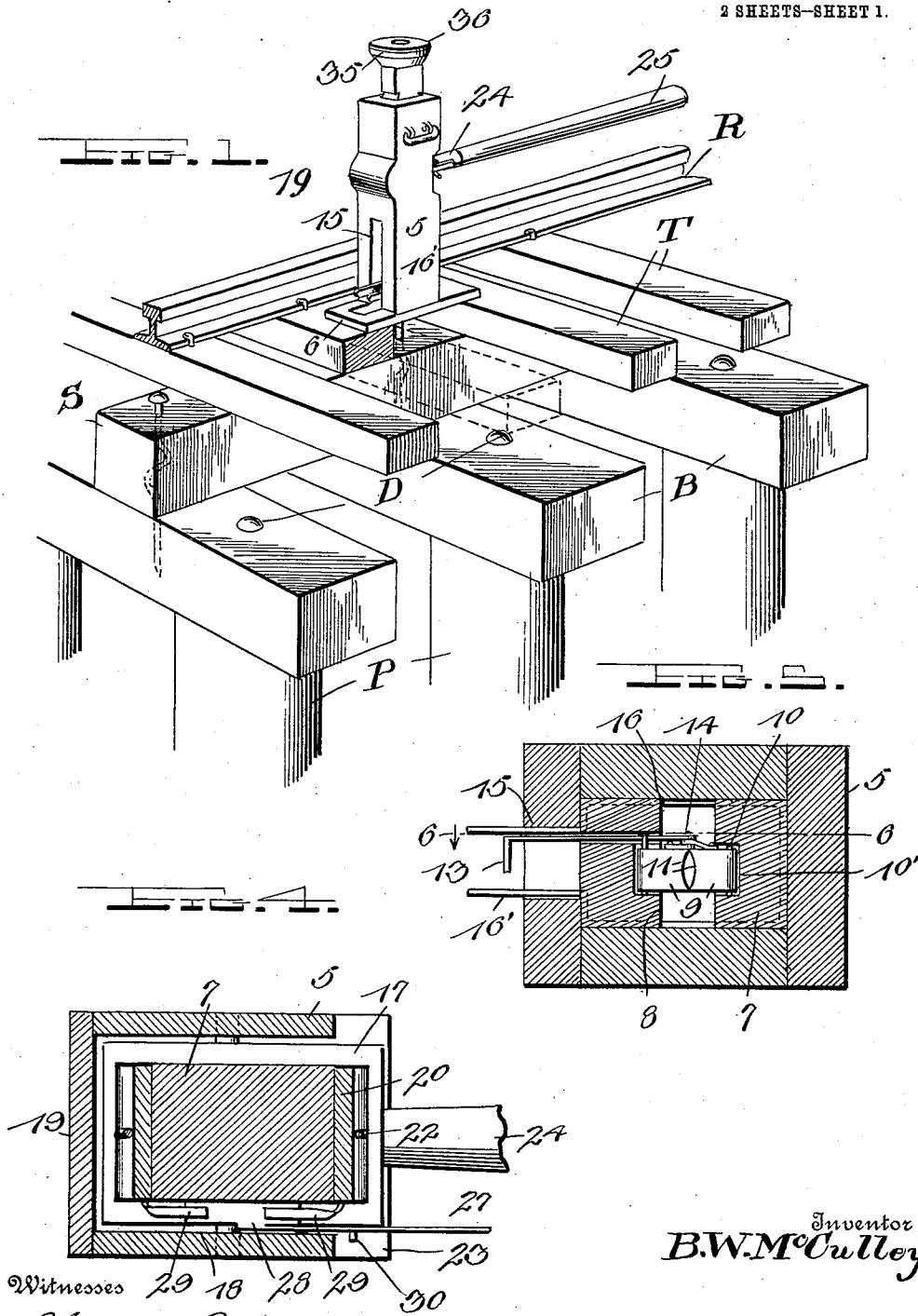


B. W. McCULLEY.
NAIL EXTRACTOR.
APPLICATION FILED JUNE 15, 1912.

1,060,994.

Patented May 6, 1913.

2 SHEETS-SHEET 1.



Witnesses
Chas. R. Griesbauer
A. B. Norton.

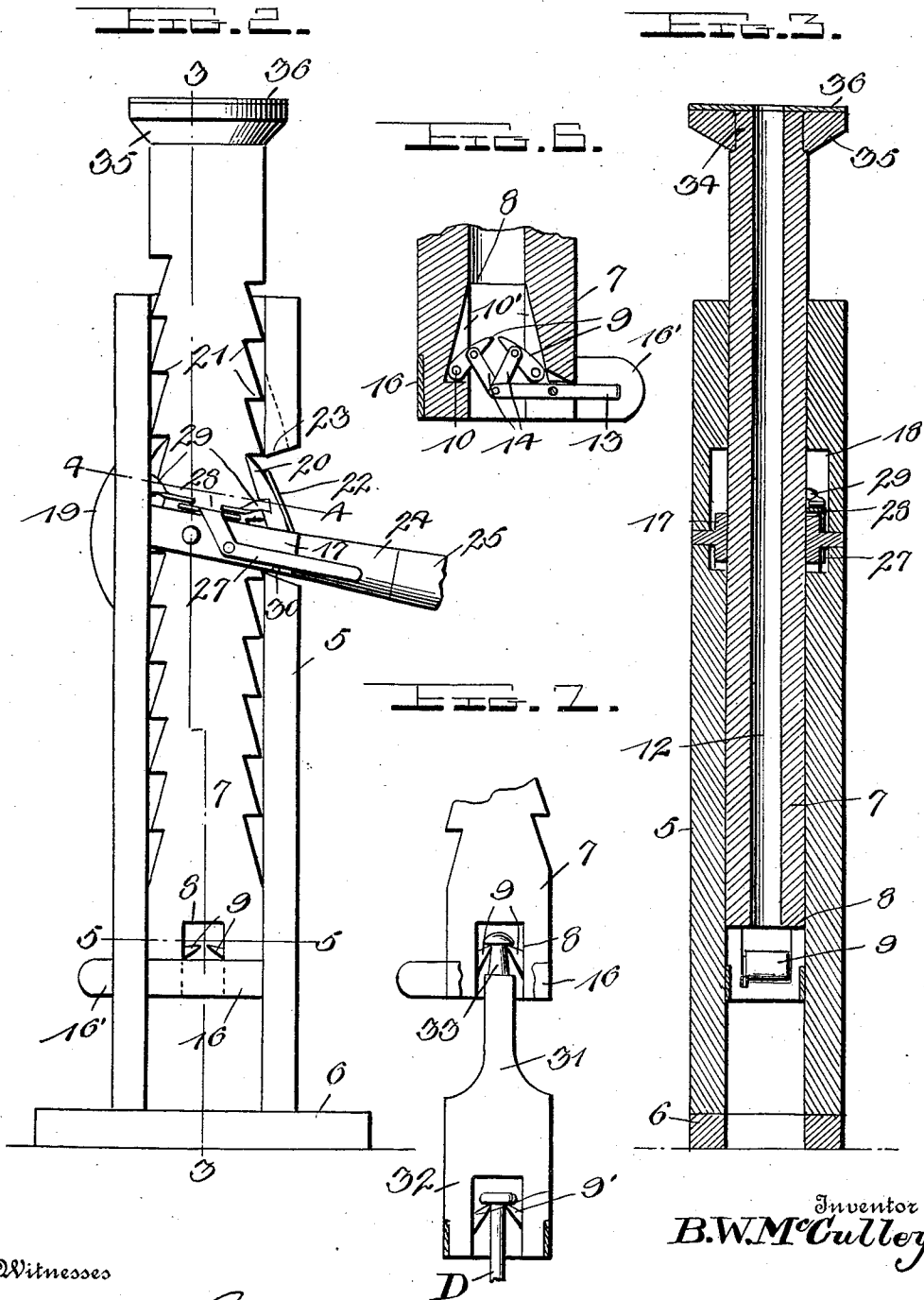
Inventor
B.W.M. McCulley,
By Watson E. Coleman,
Attorney.

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UNITED STATES PATENT OFFICE.

BURDETTE W. McCULLEY, OF WOODSTON, KANSAS.

NAIL-EXTRACTOR.

1,060,994.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed June 15, 1912. Serial No. 703,906.

To all whom it may concern:

Be it known that I, BURDETTE W. McCULLEY, a citizen of the United States, residing at Woodston, in the county of Rooks and State of Kansas, have invented certain new and useful Improvements in Nail-Extractors, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to improvements in nail extractors and has for one of its objects to provide a device primarily designed for the purpose of pulling or extracting drift pins such as are employed in railroad bridge
15 construction for securing the cross timbers and longitudinal tie supporting stringers to the piles, and which may be also used in the manner of the ordinary lifting jack.

Another object of the invention is to provide a jack for the above purpose including a vertically movable bar having gripping dogs mounted in one end for engagement with the pin, manually operable means for moving said bar, and additional means co-
20 acting with the operating means to permit of the reverse movement of the bar.

A further object of the invention resides in the provision of an auxiliary dog carrying member adapted for removable connection to the bar to provide an extension whereby the drift pins which would otherwise be inaccessible in the use of the device can be extracted.

Still another object of the invention is to provide a device of the above character which consists of comparatively few parts of simple form, which may be easily and quickly assembled and can be replaced when unfit for further use at an insignificant ex-
30 pense.

With the above and other objects in view as will become apparent as the description proceeds, the invention consists in certain constructions, combinations and arrange-
35 ment of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings in
40 which—

Figure 1 is a perspective view showing my improved nail extractor as applied for the purpose of extracting drift pins from a railroad bridge; Fig. 2 is an enlarged side elevation of the nail extractor; one wall of the casing being removed to more clearly

illustrate the operating means; Fig. 3 is a section taken on the line 3—3 of Fig. 2; Fig. 4 is a section taken on the line 4—4 of Fig. 2; Fig. 5 is a section taken on the line 5—5 of Fig. 2; Fig. 6 is a section taken on the line 6—6 of Fig. 5; and Fig. 7 is a detail elevation showing the auxiliary pin extracting bar connected to the lower end of the main bar.

For the purpose of illustrating one of the uses to which the device may be adapted, I have shown in Fig. 1 of the drawings a fragment of a railroad bridge and my improved nail extractor arranged in operative position. It will, however, be apparent as the detail description of the construction of the device is better understood, that the same may also be employed as an ordinary lifting jack and for other analogous purposes.

Referring particularly to Fig. 1, P designates the supporting piles of the bridge structure which includes the transverse cap beams B which are secured to the upper ends of the piles, and the longitudinal stringers S arranged upon said cap beams and secured thereto by means of the pins D which are driven through the stringers into the cap beams. Similar pins also secure the transverse cap beams to the piles. Upon the stringers S the usual spaced tie bars T are arranged to support the rails R. It frequently occurs in the process of aligning the track rails that the drift pins D will become bent or kinked and it is for the purpose of extracting such distorted pins that my invention is primarily devised.

With the above end in view the present invention embodies in its construction a tubular case or housing 5 which is preferably of rectangular form in cross section. This case is provided at its lower end with a base plate 6 which may be integrally formed therewith or secured to the case in any suitable manner. Within the case 5 the vertically movable extracting or lifting bar 7 is mounted. The lower end of this bar is bifurcated as shown at 8 and in the opposed walls thereof the gripping dogs 9 are pivotally mounted upon the pins 10 fixed in the opposite sides of recesses 10' provided in said walls to receive the dogs. The gripping dogs 9 are inclined upwardly from their pivoted ends and have their free ends provided with curved knife edges 11 for engagement with opposite sides of the

cylindrical drift pin D beneath the head thereof as more clearly shown in Fig. 7. The bar 7 is provided with a longitudinal opening 12 which extends entirely through the same. As the drift pins are of great length, the bar 7 must be released for downward movement through the case 5 and a new hold upon the pin obtained by means of the dogs 9 in order to complete the extraction of the pin. In this adjustment of the bar, the pin moves into the longitudinal opening or bore 12 of the bar. In order to securely engage the cutting edges of the dogs with the pin, I provide a lever 13 fulcrumed intermediate of its ends upon the lower end of the bar 7 and pivotally connected at its inner end to the links 14, the other ends of said links being connected to the opposed dogs. It will thus be seen that by simply forcing the outer end of the lever 13 upwardly, the edges 11 of the dogs are moved into close contact with the pin.

One of the side walls of the case 5 is provided with a longitudinal opening 15 to accommodate the laterally extending ends 16' of the plates 16 which are secured to opposite sides of the bar 7 at its lower end. These projecting ends of the plates are adapted to support the ends of ties or beams whereby the same may be readily lifted into position when the bar is moved in the case.

The operating means for the bar 7 comprises a rectangular yoke 17, the parallel arms of which are disposed upon opposite sides of the bar 7 and within the upper end of the case 5. The opposed walls of the case 5 are recessed as shown at 18 to accommodate the arms of the yoke. The case 5 is also provided upon one of its walls with an extension 19 to receive the intermediate portion of the yoke 17. Between the arms of the yoke and upon opposite sides of the bar 7 the pawls or dogs 20 are pivotally mounted at one of their ends. These dogs project upwardly, and the other ends thereof are yieldingly held in engagement with the opposite longitudinal series of rack teeth 21 formed on the bar, by means of the springs 22. The case 5 is provided with an opening 23 through which the ends of the yoke arms project. To the arms of the yoke a socket member 24 is secured which is adapted to receive the end of a suitable operating handle indicated at 25. The yoke arms are further provided intermediate of their ends with studs 26 which are journaled in openings provided in the opposed walls of the case 5.

In order to disengage the dogs or pawls 20 from engagement with the teeth of the bar 7, I provide the lever 27 which is fulcrumed upon one of the arms of the yoke. One end of this lever extends through the opening 23 in the wall of the case 5 while the other end of said lever is provided with

a plate 28 which is disposed over the upper edge of the yoke arm. To each of the dogs 20, one end of a heavy leaf spring 29 is secured, the free ends of said springs bearing upon the opposite ends of the plate 28. A pin 30 is removably disposed in an opening or socket provided in one of the yoke arms and is adapted to support the lever 27. When the lever is disposed above this pin, the dogs 20 are held in their operative positions in engagement with the rack teeth of the bar 7 by means of the springs 22. In order to move said dogs to their inoperative positions, the pin 30 is removed and the outer end of the lever 27 forced downwardly, thus raising the inner end of said lever which bears against the spring plates 29, said plates overcoming the tension of the springs 21 and forcing the dogs or pawls 20 outwardly. Thus the bar 7 is free to be forced downwardly through the casing 5. In this downward movement of the bar, the gripping dogs 9 in the lower end thereof release their hold. When the bar is in position to be again moved upwardly in the case, the dogs 9 are again engaged with the pin. The operator now oscillates the yoke 17, the dogs 20 alternately engaging with the rack teeth upon opposite sides of the bar 7 and moving the same upwardly. In this manner the pin may be easily and quickly extracted.

When the device is to be employed for the extraction of the pins which secure the cap beams B to the piles, it may be necessary to lengthen the pull bar 7, and to this end I provide an auxiliary bar 31, one end of which is enlarged and bifurcated as shown at 32. In this bifurcated end of the auxiliary bar the dogs 9' are arranged in a similar manner to the dogs 9 previously referred to, and are adapted to grip on opposite sides of the pin in a like manner. The upper end of the bar 31 is provided with recesses 33 in opposite faces to receive the dogs 9 in the main bar 7, which serve to effectually hold the main and auxiliary bars in connected relation. The device is now operated in the manner above described to extract the pin, the base plate 6 of the case 5 resting upon the adjacent tie bars T.

The upper end of the bar 7 is provided with a reduced cylindrical extension 34 upon which a cap or head 35 is loosely arranged. To the end of the extension 34 of the bar 7 an annular retaining plate 36 is secured. When the device is to be used as an ordinary lifting jack, the load to be lifted is disposed upon the head 35, and the bar 7 forced upwardly by oscillating the yoke 17 as previously described. The load may thus be elevated to any desired height and maintained in such elevated position.

From the foregoing it is thought that the construction and manner of operation of my

improved nail extractor will be clearly understood. The device may be easily and quickly placed in position and provides means whereby bent or distorted pins may be removed from bridges or other structures with a minimum of manual labor. The case 5 is preferably provided adjacent to its upper end and upon opposite sides with suitable handles 37 whereby the nail extractor 10 may be conveniently moved from place to place. Owing to the comparatively few parts employed in the construction of the device, and their simple form, it will be obvious that the invention is extremely strong 15 and durable in practical use and may be produced at comparatively small cost.

While I have shown and described the preferred construction and arrangement of the various elements it will be understood 20 that the invention is susceptible of considerable modification without departing from the essential features or sacrificing any of the advantages thereof.

Having thus described the invention, what 25 is claimed is:

1. A nail extractor of the character described, comprising a tubular case open at both ends, a bar longitudinally movable in the case and provided with a longitudinal 30 opening extending therethrough, the opposed walls of said opening being recessed near one end thereof, a gripping dog pivotally mounted at its lower end in each of said recesses and means for moving said bar 35 in the case to extract a pin, the pin being adapted to extend into the longitudinal opening of the bar to permit of the movement of said bar with relation to the pin.

2. A nail extractor of the character described, comprising a tubular case open at 40 both ends, a bar longitudinally movable in the case and provided with a longitudinal

opening extending entirely therethrough, the opposed walls of said opening being longitudinally recessed, a dog pivotally secured 45 at its lower end within each of said recesses and adapted for engagement with a pin to be extracted, means for moving the free ends of said dogs into engagement with the pin, said means comprising a lever pivoted 50 intermediate its ends and projecting into the longitudinal opening in said bar and link members pivotally connected to the inner ends of said lever and to the dogs, and means for moving said bar in the case to extract 55 the pin, the pin being adapted to extend into the longitudinal opening of the bar to permit movement of said bar with relation to the pin.

3. A nail extractor of the character described comprising an apertured base plate, 60 a tubular case carried by said base plate, a hollow bar longitudinally movable in said case, dogs pivotally mounted within said bar, a yoke journaled in the opposed walls 65 of the case for oscillatory movement, the case being formed with an opening through which one end of the yoke projects, pivoted spring pressed pawls mounted in the yoke, said bar being provided with teeth for en- 70 gagement by said pawls, an angular lever fulcrumed upon the yoke and having a handle portion, spring plates carried by the pawls and engaged with one end of said lever, and means removably mounted in the 75 yoke to hold the lever against movement when the pawls are disposed in their operative or inoperative position.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 80

BURDETTE W. McCULLEY.

Witnesses:

MINNIE BRUTON,
STILES E. CHAPEL.