(No Model.)

# N. SPOFFORD.

## Bit Brace.

No. 234,624. Patented Nov. 16, 1880.

*Fig. 1*

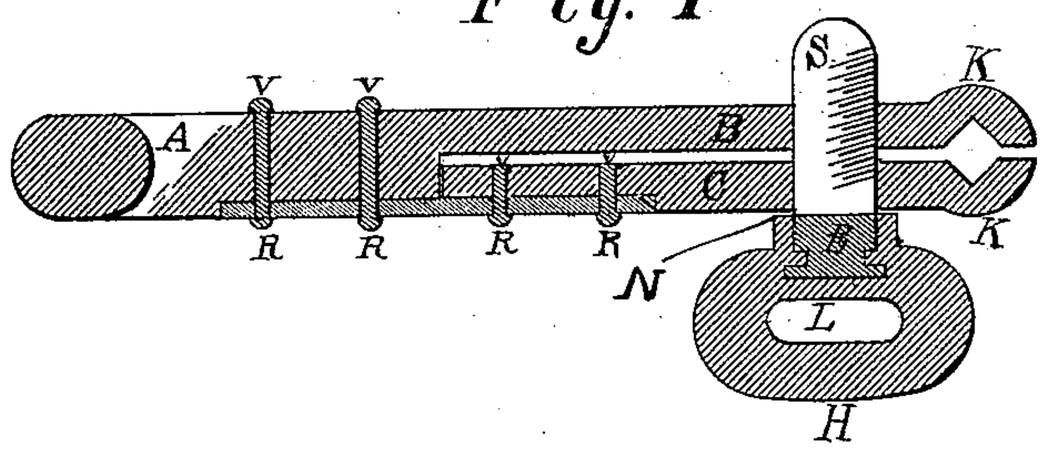
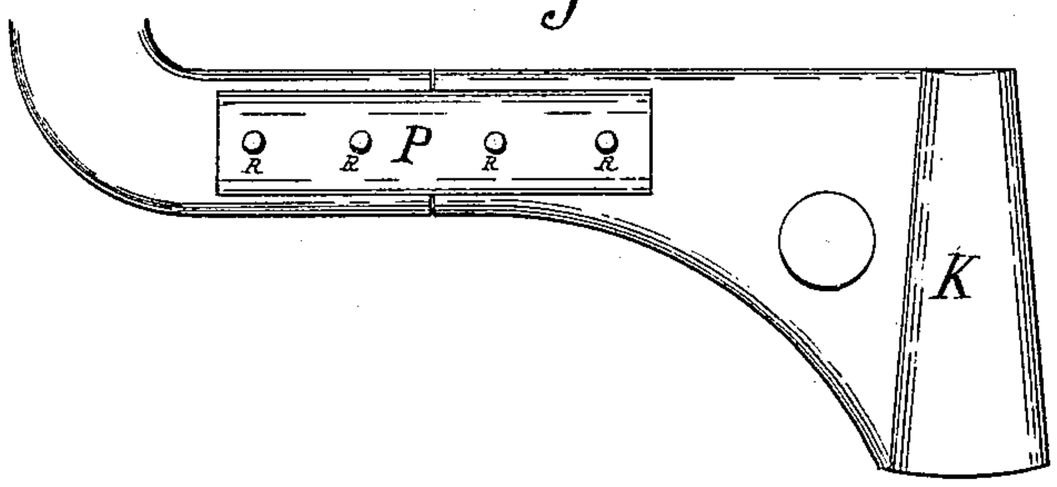



*Fig. 2*




Witnesses;
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# UNITED STATES PATENT OFFICE.

NELSON SPOFFORD, OF HAVERHILL, MASSACHUSETTS.

## BIT-BRACE.

SPECIFICATION forming part of Letters Patent No. 234,624, dated November 16, 1880.

Application filed April 13, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, NELSON SPOFFORD, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Bit-Braces; 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 pertains to make and use it, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improvement in bit-braces, and pertains to that class of bit-braces which are constructed with a divided or slitted lower arm provided with an expanding socket, the latter being opened by means of a spring and closed by a thumb-screw.

In the now common form of bit-braces, in which a portion of the lower arm is slitted vertically lengthwise along its center, and thus divided into two equal parts to form an expanding socket, there being a thumb-screw passing through the parts at a right angle to the slit to draw them together and cause them to hold the shank of a bit at the outer end, which is suitably shaped for the purpose, this lower arm must be of steel or of a superior grade of iron, in order that its two parts may have the property of elasticity and approach each other without breaking upon turning the screw in one direction, and expand of themselves when the screw is turned in the opposite direction.

Again, the thumb-screws heretofore used in construction with the expanding sockets of bit-braces have been made wholly of wrought-iron. As the shoulder of the wrought-iron thumb-screw is brought in direct contract with the arm of the bit-brace in closing the same the shoulder is soon worn away, wrought-iron being much softer than cast-iron, thereby causing an undue strain on the screw-threads, which soon operates to destroy the efficiency of the thumb-screw.

The object of my invention is to produce a bit-brace of the type referred to which shall be simple and durable in construction and of a less initial cost than bit-braces as heretofore manufactured; and with these ends in view my invention consists, first, in a bit-brace provided with a slitted or divided lower arm and expanding socket, one part of the arm and socket and the body of the brace being made of a single ordinary gray-iron casting, and the other portion of the arm and socket also made of ordinary gray-iron casting and secured by a strap of spring metal riveted to each part; or the greater portion may be made of cheap cast metal and the other of spring metal, soldered or riveted directly to the other part, whereby a strong and efficient article is produced at a low initial cost.

My invention further consists in the combination, with a bit-brace having a divided or slitted lower arm and expanding socket constructed of cast metal, of a thumb-screw constructed with a screw-threaded wrought-metal shank and a cast-metal head, thereby securing a hard-metal shoulder on the screw, which engages with the cast-metal arm of the brace, and thus preventing the undue wear of the screw.

In the accompanying drawings, Figure 1 represents a horizontal section of the lower arm of the bit-brace. Fig. 2 represents a front view of the lower arm, showing the steel spring secured in place.

A represents the lower arm of my improved bit-brace. The arm A is made of ordinary gray-iron castings, and of the two parts B and C. Part B constitutes one half of the lower arm and socket, and is cast in a single piece with the body of the brace. Part C is the other half of the divided arm and socket K, and is formed of a separate casting of ordinary gray-iron, and united to the other half, B, of the arm and to the body of the brace by means of a strap, P, of spring metal, which is secured in place by means of rivets R V, or solder or both.

Instead of making the part C of cheap cast metal, it may be made of spring metal and attached to the part B and the body of the brace by rivets or solder, and the spring P dispensed with.

The use of solder in securing one part of the arm to the other adds very much to the strength of the implement; but, in order that solder may be employed advantageously, the castings are first immersed in a liquid bath of melted tin or zinc, in the usual manner of tinning or galvanizing. This process enables the

employment of solder and serves to prevent oxidation.

A set-screw is inserted through the two parts B and C of the divided or slitted arm. This set-screw is composed of a screw-threaded wrought-metal shank, S, having one end flattened and nicked, as shown at E. The portion E is placed in a mold and a hard-metal head, H, is cast around it, thereby producing not only a cheap construction of screw, but one having a hard-metal shoulder, W, which will withstand a great amount of wear and hard usage without being impaired or worn away.

The screw is preferably provided with a slot, L, so that a screw-driver or any other suitable lever may be inserted therein to obtain more pressure than can be exerted by operating the screw by hand.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A bit-brace consisting, essentially, in the combination, with the body of the brace and one part of the divided or slitted arm and socket, formed of a single ordinary gray-iron casting, of the other half of the lower arm and socket, made in a separate piece and secured in place substantially as described, and forming an elastic arm and expansible socket, substantially as set forth.

2. The combination, with the divided arm and socket of a bit-brace constructed of cast metal, of a thumb-screw constructed with a wrought-metal shank and cast-metal head, the latter engaging with one part of the cast-metal arm, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of April, 1880.

NELSON SPOFFORD.

Witnesses:
JOHN S. SPOFFORD,
JOHN T. DESMOND.