

P. DUFFY.

EXPANDING METAL DRILLS.

No. 180,561.

Patented Aug. 1, 1976.

Fig. 1.

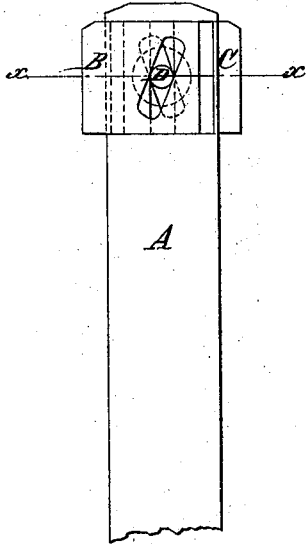


Fig. 2.

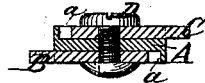


Fig. 3.

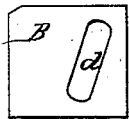


Fig. 4.

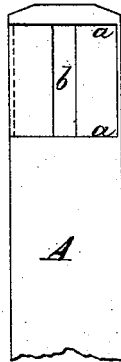


Fig. 5.



WITNESSES:

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*John Gethals*

INVENTOR:

*P. Duffy*  
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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

PATRICK DUFFY, OF NEW BEDFORD, MASSACHUSETTS, ASSIGNOR TO  
HIMSELF AND JAMES F. POWERS, OF SAME PLACE.

## IMPROVEMENT IN EXPANDING METAL-DRILLS.

Specification forming part of Letters Patent No. **180,561**, dated August 1, 1876; application filed  
July 11, 1876.

*To all whom it may concern:*

Be it known that I, PATRICK DUFFY, of New Bedford, in the county of Bristol and State of Massachusetts, have invented a new and Improved Expanding Drill, of which the following is a specification:

The invention consists of two cutters fixed in the stock to slide forward and backward transversely, the cutters being slotted obliquely and reversely to each other, and having the fastening-bolt by which they are secured to the stock fitted in said slots, and also fitted in a vertical slot in the stock, so that by shifting the bolt along the slots in one direction the cutters will be adjusted outward; by shifting the bolt the other way they will be adjusted inward.

Figure 1 is a side elevation of my improved drill. Fig. 2 is a section on line *xx* of Fig. 1. Figs. 3 and 5 are side elevations of the cutters, and Fig. 4 is a side elevation of the stock without the cutters.

Similar letters of reference indicate corresponding parts.

A represents the stock; B and C, the cutters, and D the fastening and adjusting bolt. The stock has a wide transverse groove, *a*, on each side, in which the cutters fit, and a slot, *b*, in which the bolt fits, and each cutter has an oblique slot, *d*, which the bolt also passes through, the slots being arranged reversely to each other as to their inclination, so that it pushes the cutters outward when it is shifted downward, and draws them inward when it is shifted upward.

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

The combination of the stock A, having the grooves *a* and slot *b*, cutters B C, having the reversely-inclined slots *d*, and the fastening and adjusting bolt D, substantially as specified.

PATRICK DUFFY.

Witnesses:

TIMOTHY DRISCOLL,  
MICHAEL POWERS.