G. W. CLOUGH.

FLUE-CLEANER.

No. 187,255. Patented Feb. 13, 1877.

Fig. 1.

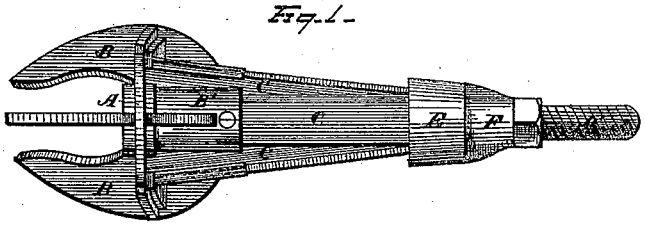



Fig. 2.

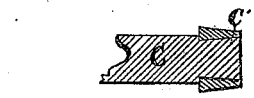
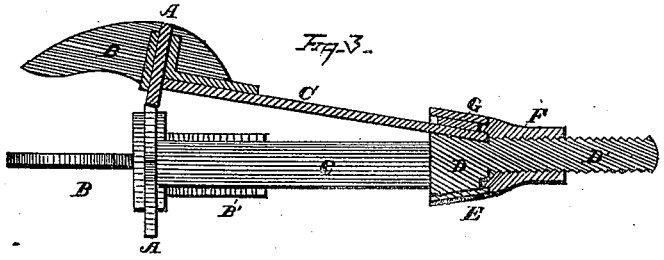




Fig. 3.




WITNESSES.

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# UNITED STATES PATENT OFFICE.

GEORGE W. CLOUGH, OF CLEVELAND, OHIO, ASSIGNOR TO HIMSELF AND WILLIAM W. DAVY, OF SAME PLACE.

## IMPROVEMENT IN FLUE-CLEANERS.

Specification forming part of Letters Patent No. 187,255, dated February 13, 1877; application filed April 24, 1876.

*To all whom it may concern:*

Be it known that I, GEORGE W. CLOUGH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Flue-Cleaners; 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 accompany drawings, which form part of this specification.

My invention relates to an improvement in flue-cleaners for cleaning tubular flues; and consists in the combination of devices and appliances hereinafter set forth and claimed.

In the drawings, Figure 1 is a view in elevation of my improved flue-cleaner. Fig. 2 is a view showing the manner of dovetailing the ends of the springs into the central or wedge blocks. Fig. 3 is a longitudinal central section of the cleaner.

A are scrapers or cutters, which act directly upon the obstructions in the flue. They are triangular in shape, with their cutting-edges on the arc of a circle, corresponding in size with the flue to be scraped. B are guides for guiding the cleaner properly into the flue, and which also serve in a measure to split off the impediments in the flue ready to be carried out by the cutters.

The cutters shown in the drawings are, preferably, formed of steel, though they may be formed of any suitable metal.

The guides B are, as shown in the drawings, formed of cast metal, though they may be of wrought metal. The cast metal, however, can readily be made with wings B′, whereby the guides can be easily riveted to the spring-arms and to the plate A. C are spring-arms made, preferably, though not necessarily, of of tempered steel. Each of the arms C has a dovetail tenon, C′, at its lower end to fit into a corresponding dovetail mortise in the central or wedge block D, which block has faces to correspond with the several arms that are employed. D′ is a bolt with a screw-shaft. This bolt is cast into the wedge-block D so as to make a rigid part of it. E is a ferrule, tapered to correspond with the taper of the wedge-block D, and of a size sufficient to slip over the said block to hold the spring-arms in place. F is a nut, run upon the shaft D′ until it strikes the ferrule E. By then forcing it farther on it draws the wedge-block D down strongly into the ferrule E until the whole structure is bound firmly together, and, when attached to any suitable rod or handle, forms the complete instrument.

The nut F is recessed at its outer edges, so as to permit the ferrule to fit down into the said recess, and thus hold the two parts firmly in their proper relationship with each other.

It is apparent that I am not strictly limited to three arms and cutters, but there may be any desired number, each cutter being attached to a separate arm.

It will be observed that these cutters are all arranged in the same plane. It is necessary, therefore, that their inner edges should be cut away somewhat, so as to permit the cutters to be contracted somewhat more than simply enough to enter the flue.

It is not absolutely essential that the cutters should be all on the same plane. They may be so situated as to overlap each other, and thus admit of any degree of contraction, though, on account of the curve given to the cutting edges A, the same size of cleaner is only adapted to clean flues which vary but moderately in diameter. Flues much larger or much smaller should have a corresponding size of flue-cleaner.

In case it is desired, steel or iron wedges G may be driven in between the ferrule and the wedge-block, to assist in holding the arms firmly in their places.

The nut F is, preferably, made hollowed or recessed on its under side, so as to lighten it.

The attachment of the spring-arms to the wedge-blocks by means of the dovetail groove in the wedge-block, allow of the ready detachment of the spring-arms, should they become impaired and thereby necessitate renewing.

By unscrewing the fastening-nut and removing ferrule E, the arms C may be readily removed from the dovetail groove C′ in said wedge-block. The dovetail groove also prevents any longitudinal movement of the spring-

arm, which tendency is great, as the cleaner is reciprocated within the flues or tubes of a boiler.

The dovetail wedge-block D serves to prevent any end play of the scrapers in either direction, and also any lateral displacement of the same while in operation. The nut F simply serves to keep the collar G in position, and the latter secures the wedges against the arms of the scrapers, whereby the arms are readily removed when worn or broken.

What I claim is—

1. In a flue-cleaner, the combination, with the wedge-block D and bolt D′, of the nut F, recessed as described, ferrule E, and arms C, substantially as and for the purpose described.

2. In a flue-cleaner, the combination, with the wedge-block D, and bolt D′, rigidly secured together, of the nut F, recessed as described, ferrule E, and arms C, substantially as and for the purpose described.

3. In a flue-cleaner, the combination, with the wedge-block D, and bolt D′, rigidly secured together, of the nut F, recessed as described, ferrule E, and arms C, the ends of which have tenons cut thereon to fit the dovetail grooves in the wedge-blocks, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. CLOUGH.

Witnesses:

FRANCIS TOUMEY,

JAMES P. WALSH.