No. 776,452. PATENTED NOV. 29, 1904.

J. J. BYERS.

TUBE OR FLUE CLEANER.

APPLICATION FILED JULY 1, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

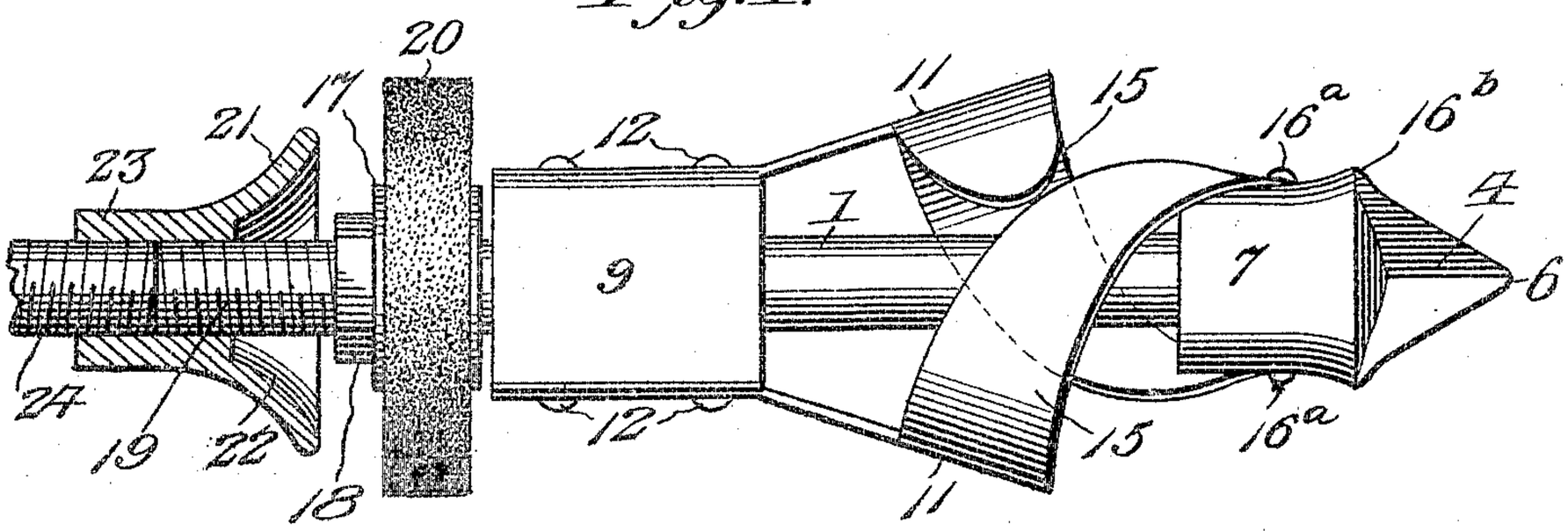


Fig. 2.

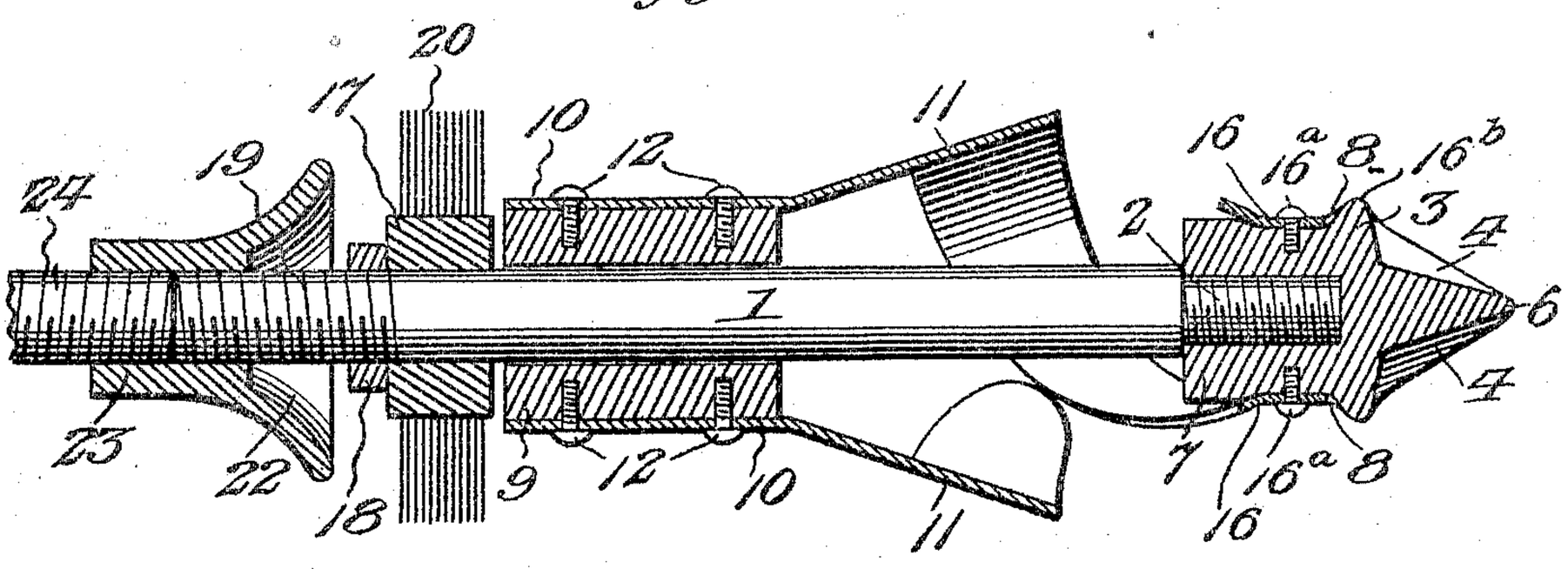
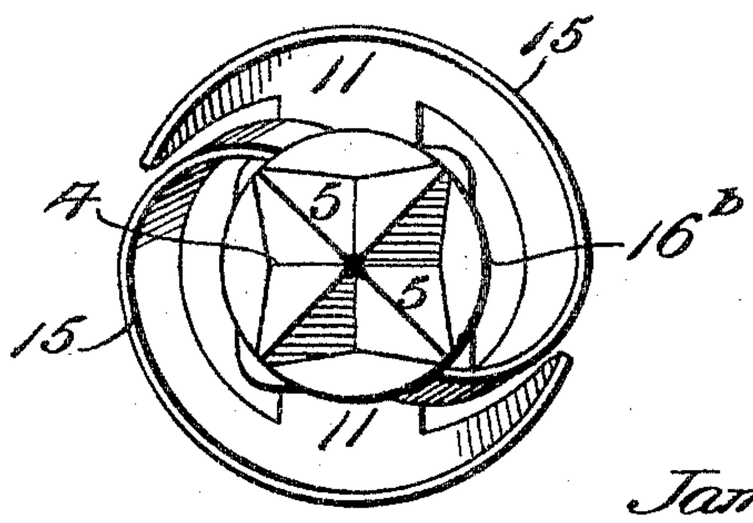


Fig. 3.



Witnesses
Edwin F. Mackee
Chas. S. Hoyer.

Inventor
James J. Byers

By Victor J. Evans
Attorney

No. 776,452. PATENTED NOV. 29, 1904.

J. J. BYERS.

TUBE OR FLUE CLEANER.

APPLICATION FILED JULY 1, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

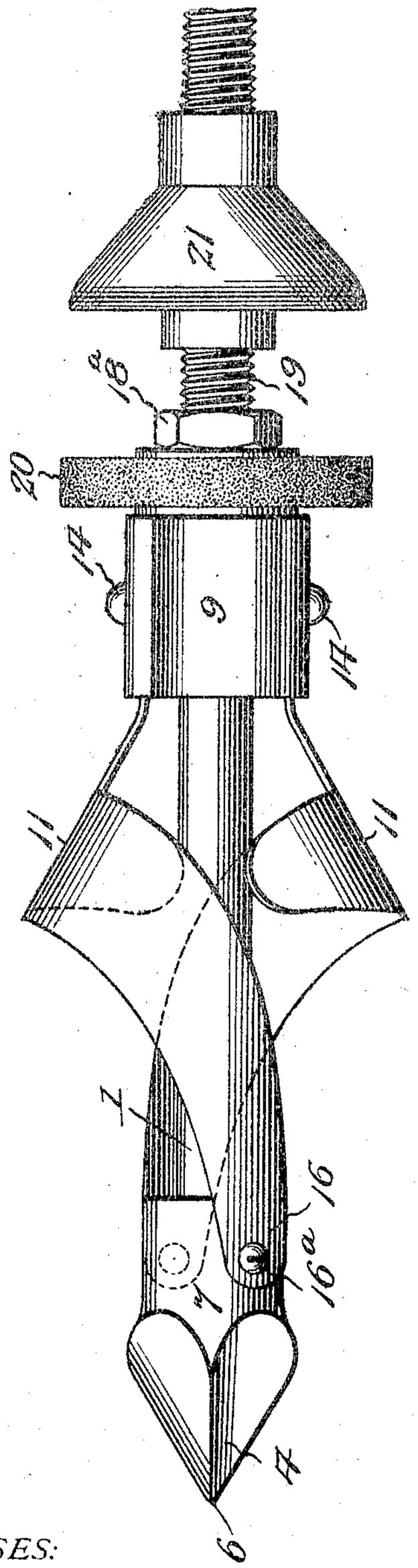


Fig. 4.

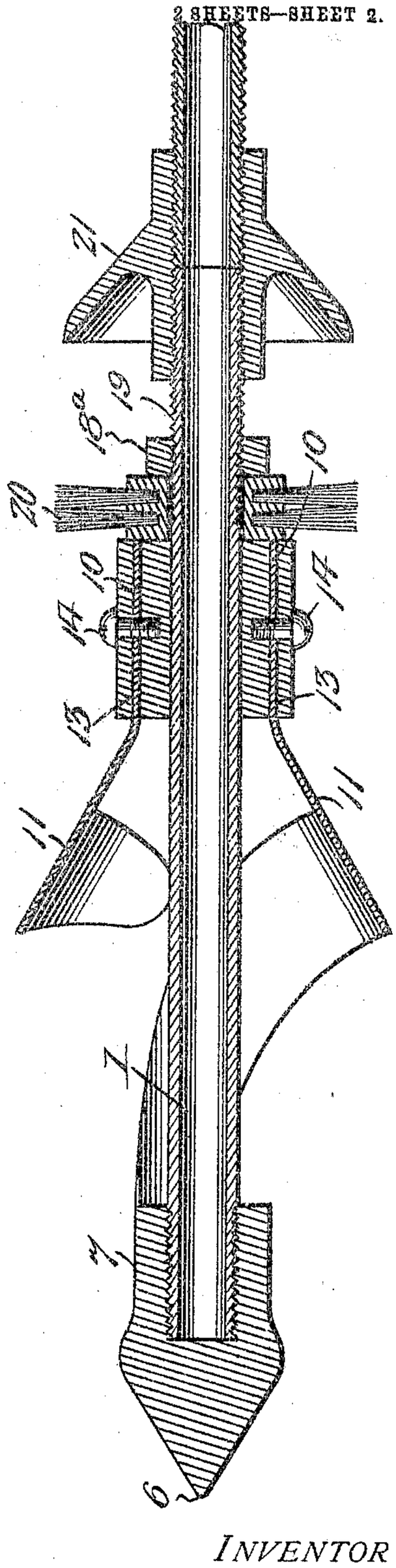


Fig. 5.

WITNESSES:

Edwin F. McKee

Chas. S. Hoyer.

INVENTOR

James J. Byers

BY Victor J. Evans

Attorney

No. 776,452. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

JAMES J. BYERS, OF PENSACOLA, FLORIDA, ASSIGNOR TO J. B. BRITTAIN.

TUBE OR FLUE CLEANER.

SPECIFICATION forming part of Letters Patent No. 776,452, dated November 29, 1904.

Application filed July 1, 1903. Serial No. 163,917. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. BYERS, a citizen of the United States, residing at Pensacola, in the county of Escambia and State of Florida, have invented new and useful Improvements in Tube or Flue Cleaners, of which the following is a specification.

This invention relates to tube or flue cleaners; and one object of the same is to equip a device of this class with coöperating yielding elements for thoroughly removing sediment and accumulations in tubes or flues and also having such construction that they will resist breakage.

A further object of the invention is to provide a tube or flue cleaner having automatically-adjustable blades to compensate for variations in the diameter of different tubes or flues without requiring a manual adjustment, and thereby insuring a positive engagement of the blades at all times with the wall of the tube or flue and to embody in the construction of the cleaner a solid auger-point to loosen the sediment or accumulation within the tube or flue that may have become hardened to such an extent as to resist the ready insertion of the cleaner.

A further object of the invention is to provide a cleaner for tubes or flues having self-adjusting blades, an auger-point, and a brush device for pushing the loosened material outwardly from the tube or flue with which the cleaner is operated.

With these and other objects and advantages in view the invention consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation, partly in section, of a cleaner embodying the features of the invention and showing the handle or operating-rod broken away. Fig. 2 is a vertical longitudinal section of the cleaner with the handle or operating-rod broken away. Fig. 3 is a front elevation of the cleaner. Fig. 4 is a side elevation of a modified form of the cleaner. Fig. 5 is a vertical longitudinal section of the cleaner shown by Fig. 4.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a center shaft or cylindrical bar of sufficient length to operatively support the parts of the cleaner and has its front end 2 reduced and screw-threaded to removably receive an auger-head or center point 3, provided with a series of converging blades 4, intersected by recesses 5. The blades 4 converge to a front pointed end 6, and, as shown by Fig. 3, the contour of the portion of the head carrying the blades is approximately square. The shank 7 of the head 3 is substantially cylindrical, and at diametrically opposite points said shank is formed with recesses 8. Extending longitudinally into the shank from the rear end is a screw-threaded socket to receive the screw-threaded end 2 of the shaft 1. This construction is practically similar in both forms of the device shown, except that the shaft 1 (shown by Figs. 4 and 5) is without the shoulder at its front end to indicate that the application of the head is not dependent upon the formation of the said shoulder.

Loosely mounted on the shaft 1 in rear of the head 3 is a sleeve 9, to which the shanks 10 of blades 11 are removably secured by screws or analogous fastenings 12. In the form of the device shown by Figs. 1, 2, and 3 the shanks 10 of the blades are exteriorly applied to the sleeve and held by two screws or analogous fastenings 12. In the form shown by Figs. 4 and 5 the rear shanks of the blades are inserted in slots 13 in diametrically opposite portions of the sleeve 9 and removably fastened to the latter by single screws 14, engaging each shank. The blades 11 flare outwardly from the front end of the sleeve 9 and have spiral members 15, surrounding the shaft in reverse directions and formed with front cutting edges. The front ends 16 of the members 15 are secured in the recesses 8 in the shanks 7 of the head 3 by screws or other fastenings 16^a, and the portion of the head 3 in advance of the recesses projects outwardly a greater distance in advance of the shank 7, as at 16^b, to thereby remove all liability of the front ends of the members 15 contacting with any obstruction

during the operation of the cleaner in a tube or flue and avoid breaking the blades. The blades 11 are resilient and have an automatic contraction and expansion, the sleeve 9 moving on the shaft 1 to compensate for this automatic adjustment of the blades. The attaching-shanks 10 are located between the ends of the blades 11, so that the rear ends of the blades are left free and unsupported, so that they may adjust themselves to all variations and inequalities within the tubes or flues. The distance the sleeve 9 is located in rear of the head 3 will depend upon the length of the blades 11 when the parts are in normal position, and it will be understood that the dimensions of the parts thus far described may be varied at will to adapt the cleaner for use with tubes or flues of different sizes or those having an inner diameter greater than the maximum projection of the blades.

On the shaft 1 in rear of the sleeve 9 a circular brush-head 17 is secured by a collar 18 in the form shown by Figs. 1, 2, and 3 and by a nut 18ª in the form shown by Figs. 4 and 5, the said collar and nut in each instance fitting over the rear screw-threaded extremity 19 of the shaft. Any other suitable means for fastening the head 17 on the shaft may be provided, as any particular mode of securing this part of the cleaner is not essential. The head 17 carries a circular brush 20, having a diameter equal to the maximum projection of the blades 11 in order that the wall of the tube cleaned may be fully engaged by the brush to remove the loosened accumulations or sediment from the tube. A removing device 21 is detachably secured on the screw-threaded extremity 19 of the shaft 1 and comprises a front bell 22, which serves to push the loosened sediment or accumulations out of the tube or flue, and from the bell a screw-threaded socket 23 projects rearwardly beyond the rear terminal of the shaft 1, and to said socket the front screw-threaded extremity of an operating rod or handle 24 is secured. The rod or handle 24 may be of any suitable length and in some instances may consist of a series of jointed rods or handles, which is a common expedient in this class of devices.

The blades 11 can be removed for sharpening and reset at any time desired without disturbing the remaining elements of the cleaner, or in the event that said blades become so much worn as to be of impractical use they may be replaced by others of a similar nature. It will be seen that the spiral members of the blades fully surround in reverse directions the shaft 1, and thus the cutting edges will be brought into full engagement with the interior wall of a tube or flue and effectively operate on every part of such wall.

The cleaner is inserted in the outer end of the tube and pushed forward and at the same time given a rotary movement, particularly if the tube or flue be clogged to such an extent as to resist the insertion of the cleaner. The rotation of the cleaner will cause the blades 4 of the heads 3 to loosen the accumulation or sediment and permit the blades 11 to subsequently act and more fully detach the accumulation or sediment from the wall of the tube or flue. This operation is repeated and the cleaner moved forwardly and backwardly until the tube or flue is thoroughly cleaned, and during such operation the brush 20 thoroughly cleans the tube or flue and the bell 22 pushes forwardly any sediment or accumulation that may be left loose in the tube or flue by the brush.

The mode of fastening the shanks 10 of the blades 11 shown by Figs. 4 and 5 tends to strengthen the said shanks and at the same time reduces the number of fastening-screws necessary to secure the blades to the sleeve. In applying the blades 11 to the sleeve in this modified construction they are pushed longitudinally into the slots 13 from the front end of the sleeve, and the screws 14 are then secured in place in the sleeve and shanks.

The improved device will be found exceptionally useful for the purpose for which it has been devised, and in the construction of the several parts metal will be used in view of its durability. The shaft 1 will also be preferably formed of gas-pipe of a diameter proportionate to that of the cleaner.

Having thus fully described the invention, what is claimed as new is—

1. In a tube-cleaner, a shaft, an auger-head secured on the front end of the shaft and having converging blades or cutters terminating at an intermediate circumferential enlargement, resilient blades surrounding the shaft and having their front extremities secured to the head in rear of said enlargement, and means freely movable on the shaft to which the rear terminals of said blades are attached.

2. A tube-cleaner comprising a shaft having an auger-head on the front extremity thereof, a sleeve movable on the shaft in rear of the head, spiral blades connected to the head and sleeve, a brush fixed to the shaft in rear of the sleeve, and a combined cleaning device and handle-socket on the shaft in rear of the brush, said head being enlarged in advance of the forward terminals of the blades, substantially as described.

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

JAMES J. BYERS.

Witnesses:
J. N. ANDREWS,
J. B. BRITTAIN.