Jan. 2, 1951 W. S. JOHNSON 2,536,185

FLUE CLEANING BRUSH WITH RESILIENT RADIAL SCRAPING BRISTLES

Filed Dec. 14, 1945 2 Sheets-Sheet 1

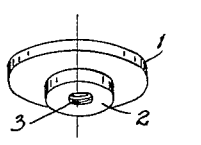


Fig 4

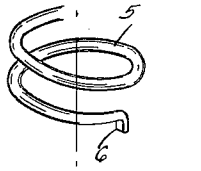


Fig 5

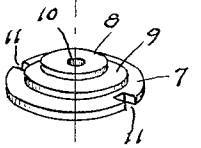


Fig 6

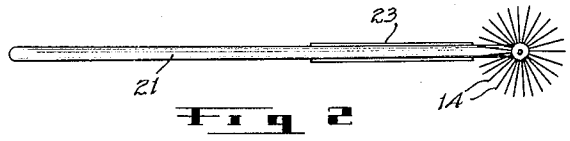


Fig 2

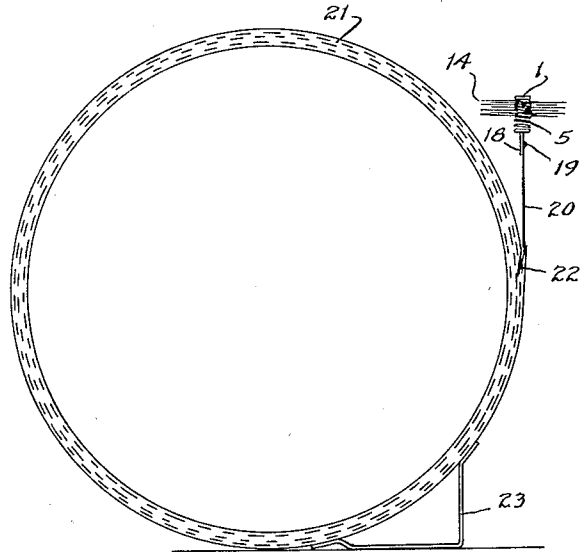


Fig 1

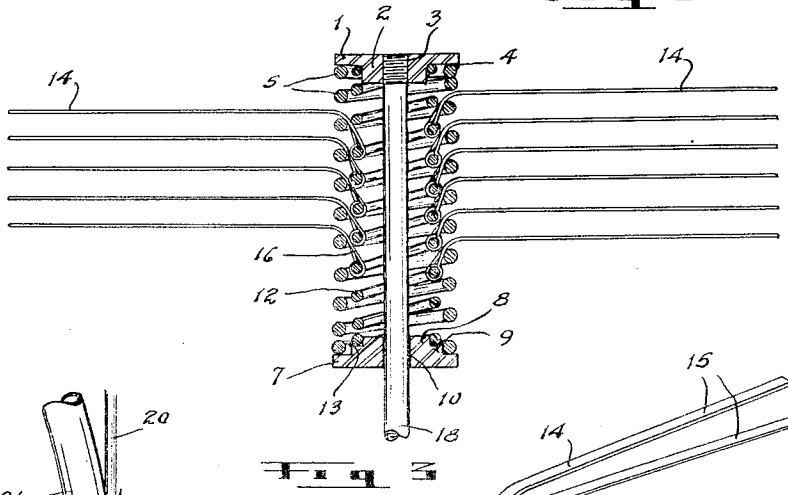


Fig 3

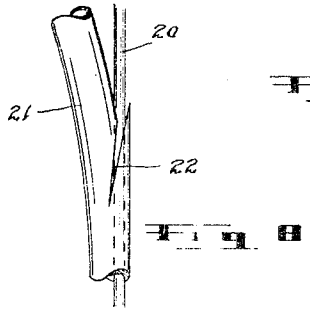


Fig 8

Fig 7

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FLUE CLEANING BRUSH WITH RESILIENT RADIAL SCRAPING BRISTLES

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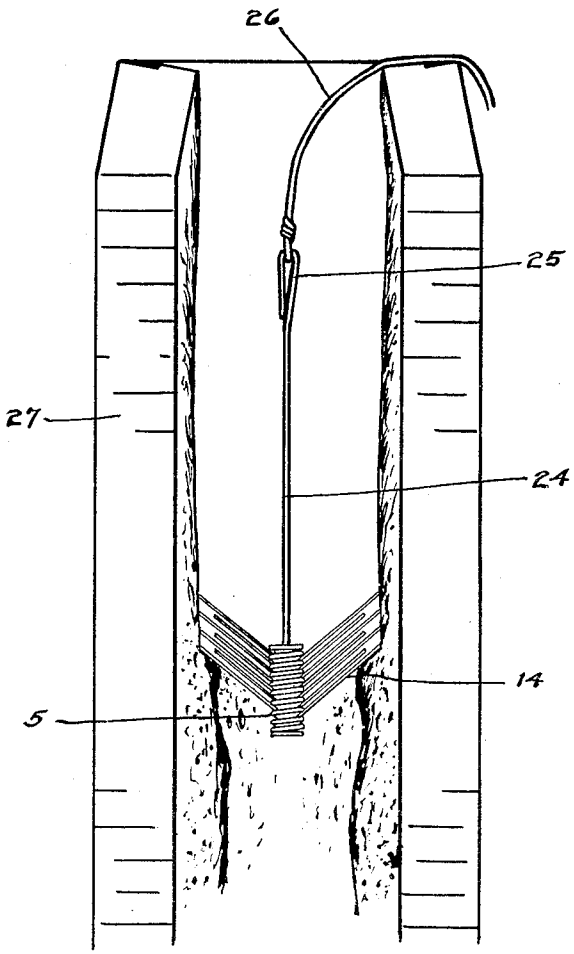


Fig. 9

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FLUE CLEANING BRUSH WITH RESILIENT RADIAL SCRAPING BRISTLES

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4 Claims. (Cl. 15—162)

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The invention relates to flue or chimney cleaners and the principal object of the invention is to construct a device which can be inserted up a chimney from the basement of a building for efficiently cleaning the same, or can be operated in the same manner down the chimney, from the roof.

A further object of the invention is to construct the cleaner in a folding manner for ease of passage in one direction through the flue or chimney and for scraping action in its passage the other way, while at the same time, making provision for passing positive obstructions in the flue passage and provide space through the cleaner to permit the fall of soot or other materials scraped from the walls by the operation.

A further object of the invention is to construct the cleaner in a locked assembly of removable and compressible parts for ease of repair to broken or worn sections and for resilient adjustment of certain parts to the degree required for the work.

A still further object of the invention is to construct the various parts in a simple manner for ease and cheapness of manufacture, to design the working parts rugged enough to stand up under hard usage and the wear of rough surfaces, and still produce a compact assembly which can be easily transported and used by a single operator.

With the above important and other minor objects in view, which will become more apparent as the description proceeds, the invention consists essentially in the construction and arrangement of parts hereinafter, more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a face view of the flue cleaner and the container.

Figure 2 is a plan view thereof.

Figure 3 is an enlarged vertical section through the flue cleaner itself.

Figure 4 is a perspective view of the upper disk.

Figure 5 is a perspective view of the lower part of the outer spring.

Figure 6 is a perspective view of the lower disk.

Figure 7 is a perspective view of one of the spring scrapers.

Figure 8 is an enlarged detailed partial view of the container showing the method for receiving the operating connection.

Figure 9 is a diagrammatic section through a chimney, showing the flue cleaner inserted from the top and connected to a rope.

In the drawings, like characters of reference indicate corresponding parts in the several figures.

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A disk 1, having a downwardly extending boss 2 and a centrally tapped hole 3, is brazed at 4 to a coil spring 5, the outer periphery of the spring being aligned with the edge of the disk. The lower end of the spring 5 is ground to a slight taper and then bent downward at a right angle to form a hook 6, shown in Figure 5, and for a purpose later described.

A disk 7, shown in Figures 3 and 6, has a relatively small central upwardly extending boss 8, a lower stepped down larger boss 9 and a central hole 10. A series of notches 11 are also provided around the periphery of the disk 7, and while only two are shown in the drawings, more may be added if required. A coil spring 12 is received over the boss 8 and sits on the boss 9, where it is brazed at 13.

A spring scraper 14, shown in Figure 7, is formed in one piece from a flat steel ribbon to form diverging prongs 15, having offsets 16 and a connecting loop 17.

A number of spring scrapers 14 are mounted on the coils of the spring 12 by passing the upper end of the spring through the loops 17, the scrapers being side by side therearound on the coils. When the scrapers have been slid theredown to the correct distance they can be stopped by a little weld (not shown) on the coil spring and the upper one can be stopped from moving up by a light wire (not shown) wound tightly around the coil at that spot. When a sufficient number of scrapers have been so mounted, the disk 7, the coil spring 12 and the scrapers all form a unit which is inserted within the coil spring 5, the spring scrapers being received and screwed between the coils of the spring 5 with the whole unit moving thereup in this manner until the upper end of the coil spring 12 passes over the boss 2, as shown in Figure 3. The hooked end 6 of the spring 5 is received within one of the notches 11 when sufficient compression has been attained and this locks all the parts together with the scrapers 14 projecting horizontally and radially outward all around the coil springs like a hedgehog.

It will be observed in Figure 3 that the offsets of all the scrapers contact the loops 17 of the next higher scraper or the coil of the spring 12 and at the other side contact the coil 5, just before curving and passing horizontally outward. In other words; the offsets are jammed between these two points by the resiliency of the two springs. The upper coil mentioned prevents the

scrapers from moving farther upward except by resilient bending of the steel spring ribbons and the coil 5 holds them horizontal. If the outer ends of the scrapers are manually pressed downward, the offsets 16 act as levers against the coils, moving the inner coils of the spring 12 slightly upward and the coils of the outer spring slightly downward. When the manual pressure is released however, the coils of the springs bring the scrapers in the horizontal position. A secondary advantage of this arrangement is that the scrapers can be pressed tightly down around the coils and wired for convenience in shipping.

The offset portions 16 of the scrapers are solely for the purpose of bringing the scraper prongs to a right angle with the axis of the springs, when in the normal position. If the prongs were straight, without offsets, they would project upwardly in an inverted cone-shape as the coil springs are always under pressure and jam the prongs between one coil of the spring 5 and a coil of the spring 12. While so jammed, they cannot move upward any farther except by the individual spring prongs being sprung. But, by fulcruming on a coil of the spring 5 and being wrapped around a coil of the spring 12, they can be moved down by exterior pressure thereagainst and so act like a lever to further tension both springs. This tension automatically brings the prongs back to the coil jammed position when the exterior pressure is removed. By observing Figure 3 of the drawings it will be noticed that the coil spring 12 could slide out of the coil spring 5 if the prongs were not there. However, when the loops 17 are slid onto the coils of the spring 12, they increase the diameter of said coils and, when the offset portions pass between a loop and a coil of the spring 5, so much space is taken up that the coils of the springs cannot pass each other axially but jam the offsets therebetween. Accordingly, the bend of the offset has no effect on the springs but merely cause the prongs to radiate horizontally from the vertical centre line of the springs. When the prongs are so attached, the coil springs can only telescope by threaded rotation and this rotation is used to vary the pressure of the springs against the offsets to increase or reduce the resistance of the prongs against collapsing.

This tensioning effect on the springs is rather peculiar. When the springs are so screwed together, the extreme upper coils of the spring 5 are stretched farther apart while the upper coils of the spring 12 are compressed. The reverse effect occurs at the bottom. These stresses react at the offsets to hold the prongs firmly and this resilient presure can be varied by the screw action of the springs.

A rod 18, having one end threaded, is passed through the hole 10 in the disk 7 and screws into the tapped hole 3. The lower end of the rod is welded at 19 to a relatively long heavy steel spring round wire 20 which forms the operating connection. This connection is received within a container 21 formed from a ring of tubing. The tubing is partly cut through at a slant with a hack saw or similar instrument as shown at 22, Figure 8, and the cut is opened up with a circular tool, such as a punch, for the entrance of the connection. The lower end of the connection is inserted in this entrance and as it is pushed in it passes around the interior of the tubing in concentric circles until approximately the full length is stored, the cleaner of course, remaining outside as shown in Figures 1 and 2. An L-shaped piece of flat metal 23 is welded to the ring tubing 21 for the reception of an operator's foot to hold the ring firmly on the floor.

In operation, the operator carries the container down to the basement of the building and places it adjacent the flue or chimney to be cleaned. His foot is placed on the L-shaped metal 23 to hold the container firm with the floor, and he then inserts the cleaner in the flue or chimney opening. He then pays out the operating connection by a hand over hand movement which draws the connection out of the container, and the cleaner is pushed up the chimney. When moving up the chimney the outer ends of the scrapers contact the walls thereof and the friction tends to collapse them inwardly in the same manner as explained for the scrapers being manually pressed downward. This collapsing action allows the cleaner to pass freely up the chimney with very little interference. When the cleaner reaches the top of the chimney, the process is reversed, the operator pulling the connection and cleaner downward with the same hand over hand movement, and the operating connection starts to return back into the container. When the cleaner is pulled back, the resiliency of the springs, as explained, holds the scrapers horizontally so that their ends press against the chimney wall and they positively scrape the soot therefrom, the same falling down the chimney to be removed in the well known manner. These operations can be repeated as often as necessary.

If there are relatively solid obstructions on the walls of the chimney, there is sufficient resilience in the spring wire of the scrapers to permit them to bend upward and so slip past the obstacle, the said resilience returning the scrapers back to their horizontal position when such obstruction has been avoided. It also might be mentioned here that if the cleaner has a tendency to pivot out of the horizontal position during the down scraping operation and caused, say by an obstruction on one wall, the strength of the operating connection is sufficient to contact the opposite wall and prevent a dip of more than a few degrees.

The above arrangement is very satisfactory for the average house or building of two or three stories. However, if the building is higher than this, the invention will work just as well from the top of the chimney. Usually, on such higher buildings, provision, such as a platform, is made for cleaning. In this operation, the cleaner can be pushed or dropped down the chimney in the same manner, and then pulled up. The action is just the same as the basement method and the cleaning just as efficient, as the prongs of the scrapers are spaced apart and there is ample room for the soot to fall therethrough to the bottom of the chimney where it can be removed as mentioned.

If the chimney is extra long, the rod 18 can be unscrewed from the cleaner to disconnect the operating connection. A similar rod 24 with a hook 25 and an attached rope 26 can be screwed in as a substitute, and the cleaner dropped down the chimney 27, indicated in Fig. 9 in the same manner as above mentioned. In this case, the rod will be long enough to prevent dipping of the cleaner and the rope will be long enough to take the length of the chimney.

From the above it will be apparent that I have provided a simple convenient device for the cleaning of chimneys or flues, which does not require a lot of time wasting joints, extensions or connections to complete the work. Nor does it mess up

the basement, other than the slight droppings from the chimney entrance when the soot is removed. All parts are so simple they can be easily and quickly assembled in manufacture or removed for replacement, and the device is much more efficient than a brush as the scrapers are much stronger than bristles, with sufficient rigidity for the work, enough resilience to give against obstructions, and are also foldable to permit the original passage through the soot. The scrapers can be made in different lengths for different sizes of chimneys and when the long ones wear down they can be used for smaller openings. All are easily replaceable. The device can be used for cleaning endless varieties of pipes or flues, is cheap to manufacture and will give long life in hard usage.

What I claim as my invention is:

1. A flue cleaner, comprising: a series of radially projecting scraping prongs encircling a primary coil spring and having their inner ends mounted on the coils of said primary spring for pivoting movement; a secondary coil spring encircling said primary spring; the coils of said secondary spring having approximately the same pitch as the coils of said primary spring and being screwed between said scraping prongs, as a unit, to support and resiliently press said prongs toward a coil of said primary spring which is adjacent to the coil on which said prongs are pivoted; and means for securing said secondary spring in selected positions of adjustment.

2. A flue cleaner, comprising: a series of flexible scraping prongs encircling a primary coil spring with one end of each of said prongs mounted on the coils of said primary spring for pivoting movement; said primary spring having one end fastened to a bearing disk; said disk having notches around its periphery; a secondary coil spring encircling said primary spring; the coils of said secondary spring having approximately the same pitch as the coils of said primary spring and being screwed between said scraping prongs, as a unit, to support and resiliently press said prongs toward a coil of said primary spring which is adjacent to the coil on which said prongs are pivoted; one end of said secondary spring being hooked into one of said notches in said bearing disk and the other end being fastened

to a secondary disk; and manually operable means connected to said cleaner for axially shifting the same.

3. A flue cleaner, comprising: a series of scraping prongs encircling a primary coil spring and having their inner ends mounted on the coils of said primary spring for pivoting movement; a secondary coil spring encircling said primary spring; the coils of said secondary spring having approximately the same pitch as the coils of said primary spring and being screwed between said scraping prongs, as a unit, to support and resiliently press said prongs toward a coil of said primary spring which is adjacent to the coil on which said prongs are pivoted; and said prongs being bent exteriorly of said secondary spring contact point to project radially and at right angles to the axis of said coil springs.

4. In a flue cleaner having a pair of telescoping coil springs; scraping prongs therefor, comprising: a spring wire having the central part bent in a spiral for slidable reception over the coils of the central one of said telescoping springs; the ends of said wire projecting in a V-shape from said spiral with the outwardly disposed end portions of the V extending approximately radially from the axis of said springs and to pass outwardly between the coils of the outer of said telescoping springs.

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