

March 6, 1951

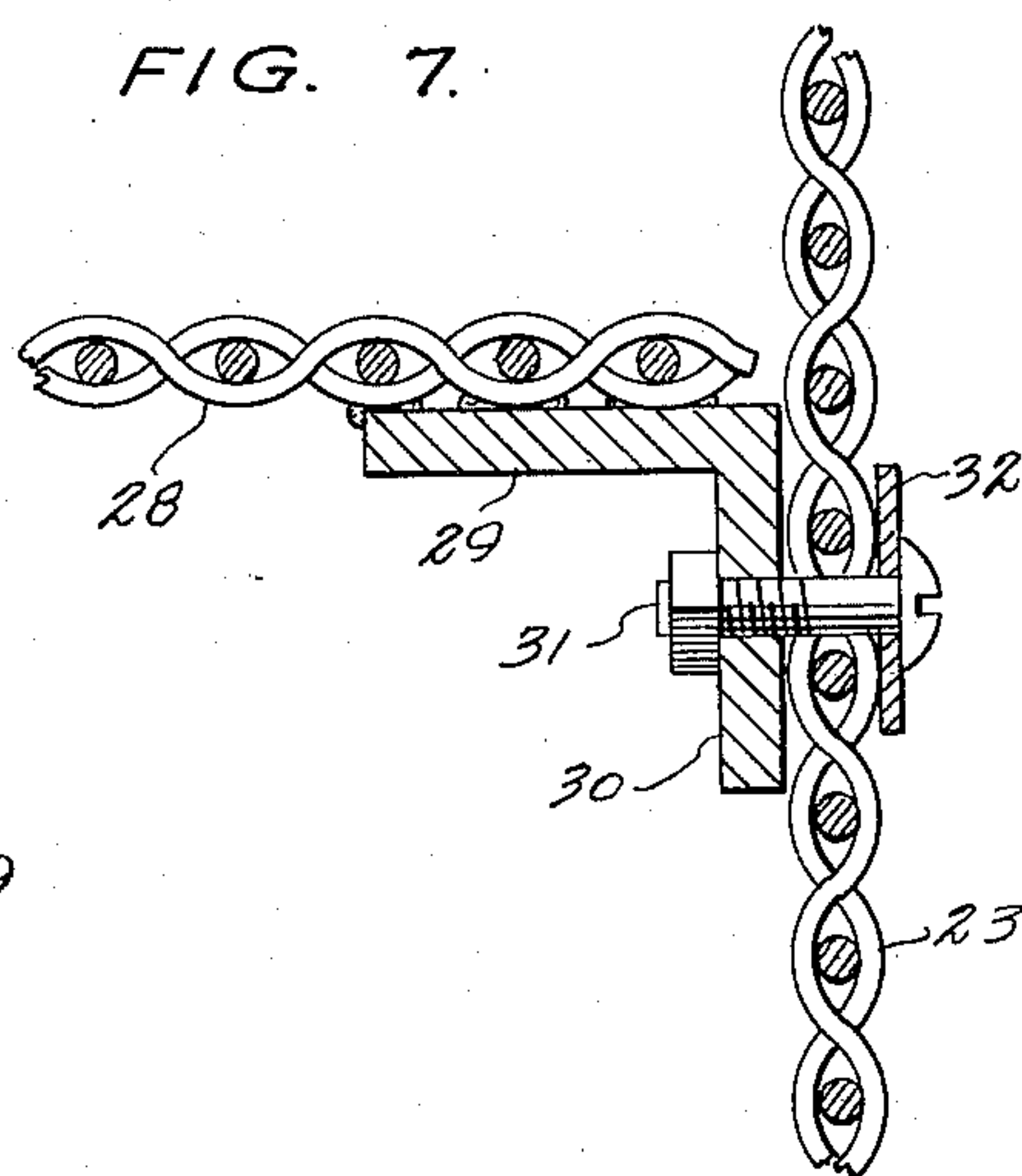
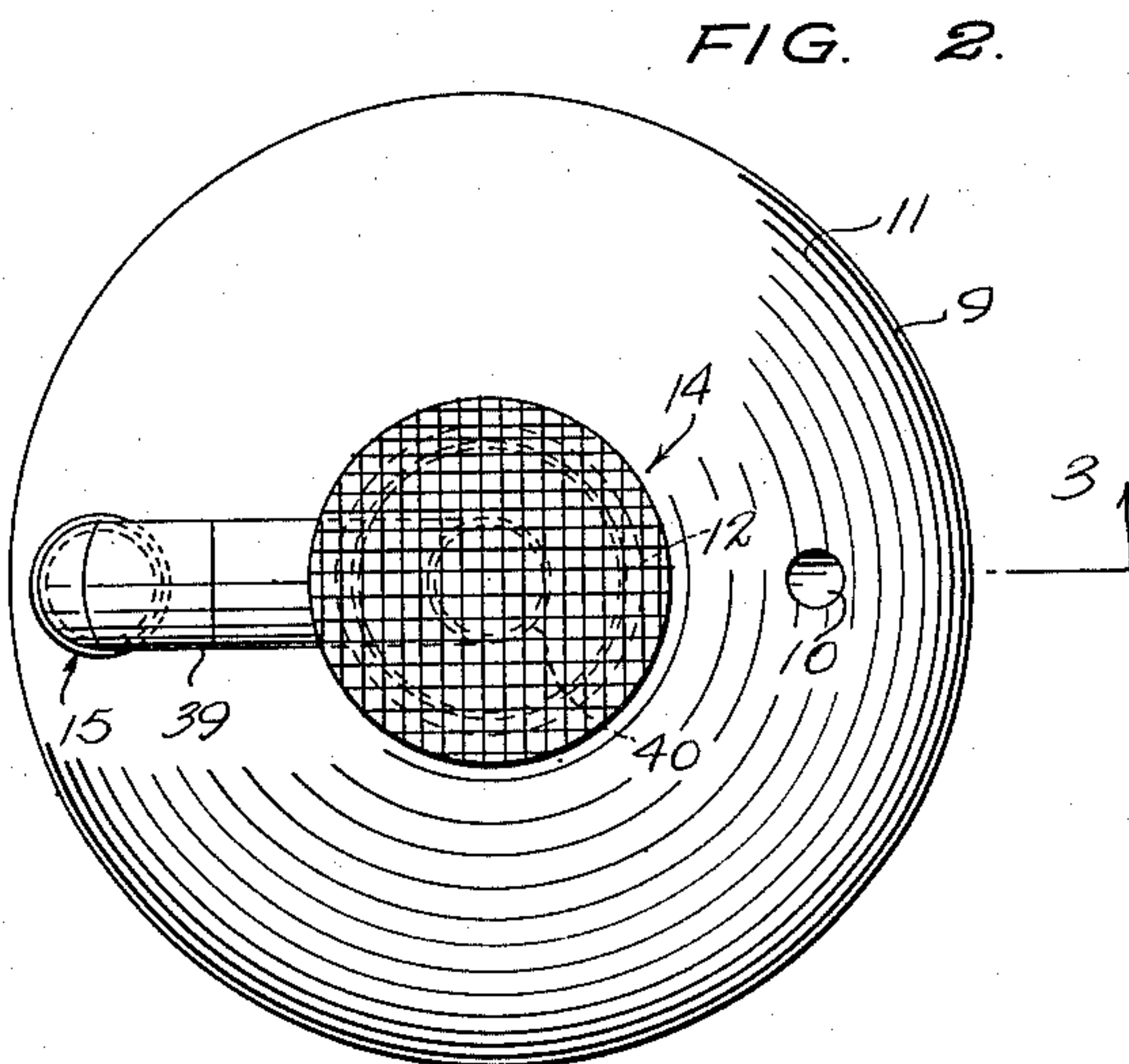
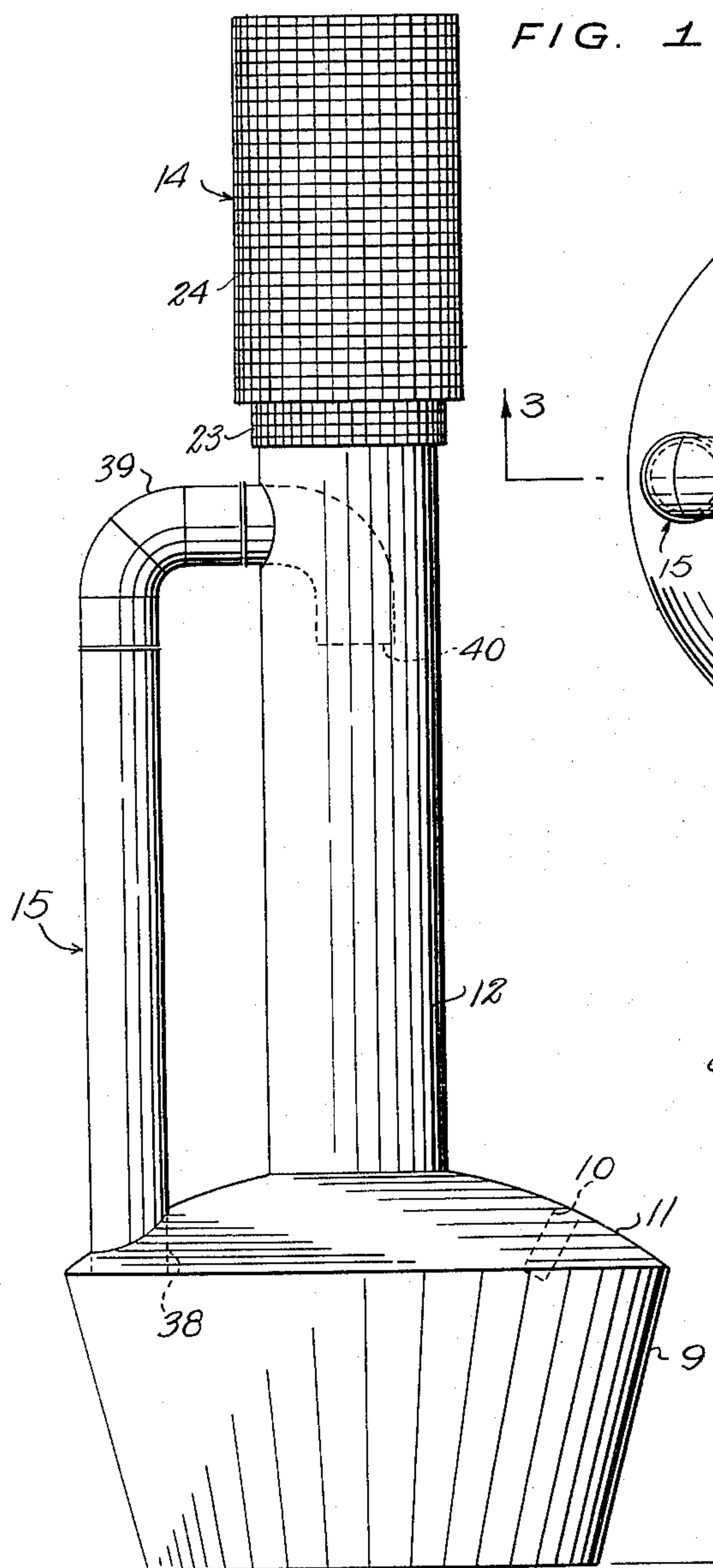
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FILTERING MEANS FOR THE STACKS OF SMUDGE POTS AND THE LIKE

Filed Nov. 10, 1949

2 Sheets-Sheet 1



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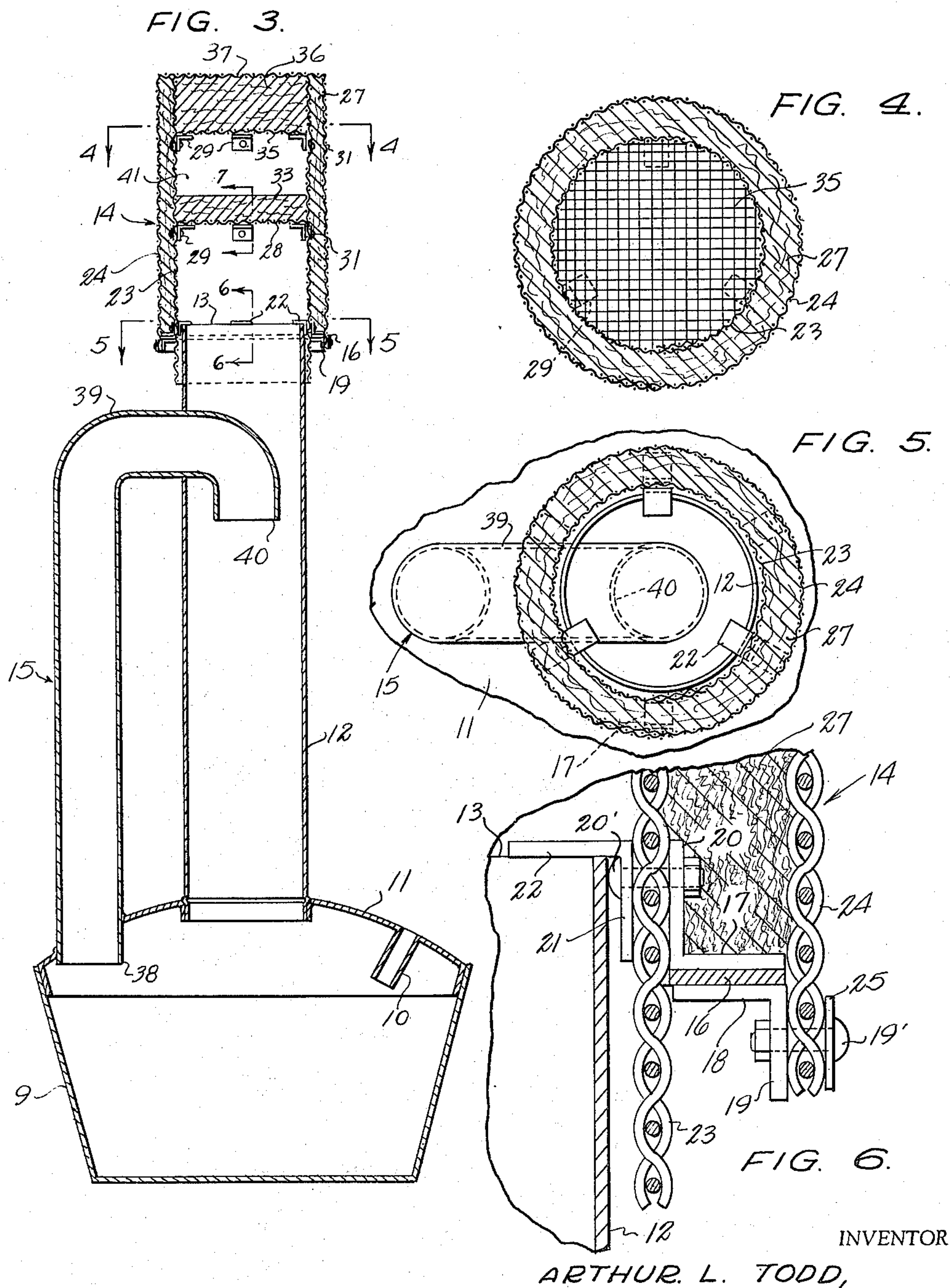
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FILTERING MEANS FOR THE STACKS OF SMUDGE POTS AND THE LIKE

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UNITED STATES PATENT OFFICE

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FILTERING MEANS FOR THE STACKS OF
SMUDGE POTS AND THE LIKE

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2 Claims. (Cl. 158—91)

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This invention relates to improved smoke-clearing and filtering means for the stacks of smudge pots, Diesel engine exhaust systems, other oil-burning apparatus, and public and private incinerator plants, the primary object of the invention being to provide means of this character which effectively eliminates discharge into the atmosphere of "smudge" and oil particles and reduces the amount of visible smoke.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, merely for purposes of illustration herein, a specific embodiment of the invention is set forth in detail.

In the drawings:

Figure 1 is a side elevation of an improved smudge pot embodying this invention;

Figure 2 is a top plan view thereof;

Figure 3 is a transverse vertical section taken on the line 3—3 of Figure 2;

Figures 4 and 5 are horizontal sections taken on the lines 4—4 and 5—5, respectively, of Figure 3;

Figures 6 and 7 are enlarged fragmentary transverse vertical sections taken on the line 6—6 and 7—7, respectively, of Figure 3.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated smudge pot comprises a conventional form of inverted frusto-conical oil container 9 having a depending lighting spout 10 on one side of its dome-like top 11. The usual stack pipe 12 rises from the center of the top 11 and terminates in an upper end 13 from which the smoke or smudge from the oil burning in the container 9 discharges into the surrounding atmosphere.

In accordance with the present invention, the stack 12 represents any pipe discharging smoke, smudge or carbon and oil-bearing smoke or products of combustion, such as the exhaust stack of a Diesel engine, and is provided on its discharge end 13 with a smoke-clearing assembly 14, and at a point preceding the assembly 14 with a breather pipe 15 acting to return to the container 9 above the oil level therein, a certain proportion of the smoke, including air passing through the stack 12 toward discharge.

The smoke-clearing assembly 14 comprises a flat ring 16 substantially larger in diameter than the stack 12 and having secured thereto, as by spot welding, at equally-circumferentially-spaced intervals, as indicated in Figures 4, 5 and 6, the upper and lower L-shaped lugs 17 and 18, re-

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spectively. The lower lugs 18 have their standard portions 19 in depending position at the outside edge of the ring 16, while the standard portions 20 of the upper lugs 17 rise from the inside edge of the ring 16. These standard portions are traversed by headed bolts 19' and 20', respectively.

The bolts 20' of the upper lugs mount inverted L-shaped support lugs 21 whose horizontal portions 22 overlie the upper end 13 of the stack 12 and support the assembly 14 thereon. The bolts 20' serve also to clamp the support lugs 21 and upper lugs 17 against opposite sides of the lower part of a metal mesh or hardware cloth inner cylinder 23, which the bolts 20' traverse, as shown in Figure 6.

The bolts 19' of the lower lugs 18 traverse the lower part of the outer metal mesh or hardware cloth cylinder 24 which is thereby concentrically spaced from the inner cylinder 23, the bolts 19' serving to clamp the outer cylinder 24 between the lower lugs 18 and washers 25 on the bolts 19'. As indicated in Figures 1, 3 and 6, the lower part of the inner cylinder 23 depends below the lower end of the outer cylinder 24 and closely surrounds the stack 12, while the upper ends of these cylinders rise to the same level.

The space between the mesh cylinders 23 and 24 above the ring 16 is filled or packed with steel wool body 27.

Midway between the upper and lower ends of the assembly 14 is an intermediate screen partition 28 supported on and welded to the horizontal portions of inverted L-shaped lugs 29 whose vertical portions 30 are traversed by bolts 31 also traversing the inner mesh cylinder 23, the inner cylinder being clamped between the vertical portions 30 and washers 32 on the bolts 31, as shown in Figure 7. Resting upon the partition 28 is a thick disc 33 of steel wool constituting a breaker.

Spaced between the breaker 33 and the upper end of the assembly 14 is the filter consisting of a metal screen partition 35 like the screen 28 and, like the screen 28, supported on inverted L-shaped lugs 29 mounted on the inner cylinder 23 by bolts 31. The space above the screen partition 35 and the top of the assembly is filled by a thick cylindrical filter body 36 of steel wool, which is topped by a metal screen cover 37 which covers also the upper ends of the inner and outer mesh cylinders 23 and 24 and the steel wool body 27.

The breather pipe 15 rises from the container top 11 parallel to the stack 12 from a point spaced

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laterally outwardly therefrom and is somewhat smaller in diameter than the stack 12. The lower end 38 of the breather pipe 15 depends into the container 9, as shown in Figure 3, and the upper part of the breather pipe 15 is turned laterally inwardly at right angles, as indicated at 39, and passes through the side of the stack 12 at a point below the assembly 14 and terminates in a right-angularly, down-turned intake end 40 which is centralized in the stack 12.

In operation, as smudge and oil particle-bearing smoke rises from the container 9 and moves toward the discharge end of the stack 12, part of the smoke passes into the intake end 40 of the breather pipe 15 and the remainder passes to the assembly 14. The portion passing through the breather pipe 15 returns to the container 9 to admix with and dilute the products of combustion containing oil and smudge producing particles, the resulting products of combustion rising in the stack 12 with a portion of such products passing into the filter or smoke clearing assembly 14 and the remaining portion being recycled through the breather pipe 15 back to the oil container 9 to admix with and dilute a further portion of products of combustion.

The portion of the smoke entering the assembly 14 meets the breaker 33 and is stripped thereby of oil particles and the larger carbon and other solid particles, which accumulate in the breaker or fall back into the container 9 through the stack 12. The stripped smoke passing upwardly through the breaker 33 passes into the chamber 41 defined between the breaker 33 and the filter 36, and upwardly through the filter body 36 and is thereby further stripped of any remaining fine carbon and other particles, and emerges from the filter body 36 in a smudge-free, almost invisible gaseous form.

In the event of use of the device to clear the smoke issuing from an incinerator or other stack, the stack replaces the pot 9 to form the disclosed apparatus, including the breather pipe 15.

What is claimed is:

1. In combination, a source of gaseous products of combustion having oil and smudge-producing particles therein, a stack having a discharge end through which said gaseous products

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are moved from said source, a clearing and filtering assembly on said discharge end of said stack acting to strip the oil and smudge-producing particles from the gaseous products as the same emerge from said discharge end, and a breather pipe having an intake end opening into said stack near said discharge end to intake from said stack a portion of the gaseous products moving therein toward said discharge end, said breather pipe having an outlet end communicating with said source whereby said portion of the gaseous products is returned to said source, said clearing and filtering assembly comprising a foraminous cylinder mounted concentrically on said discharge end of said stack, a foraminous breaker partition in said cylinder intermediate the ends thereof, and a filter partition closing the outer end of said cylinder, said filter partition being spaced from said breaker partition to define a chamber.

2. A device for clearing and filtering oil and other smudge-forming particles from smoke produced by burning oil, comprising a foraminous tube comprised of inner and outer mesh cylinders and a metal wool body therebetween, one end of said tube being open to admit the smoke, a first screen partition intermediate the ends of said tube having a metal wool breaker thereon, said tube having a discharge end opposite said one end, and a filter closing said discharge end comprising a second screen partition and a metal wool filter body thereon, said filter being spaced from said breaker to define a chamber, and mounting means at the lower end of said tube for mounting the same on a smoke pipe.

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