

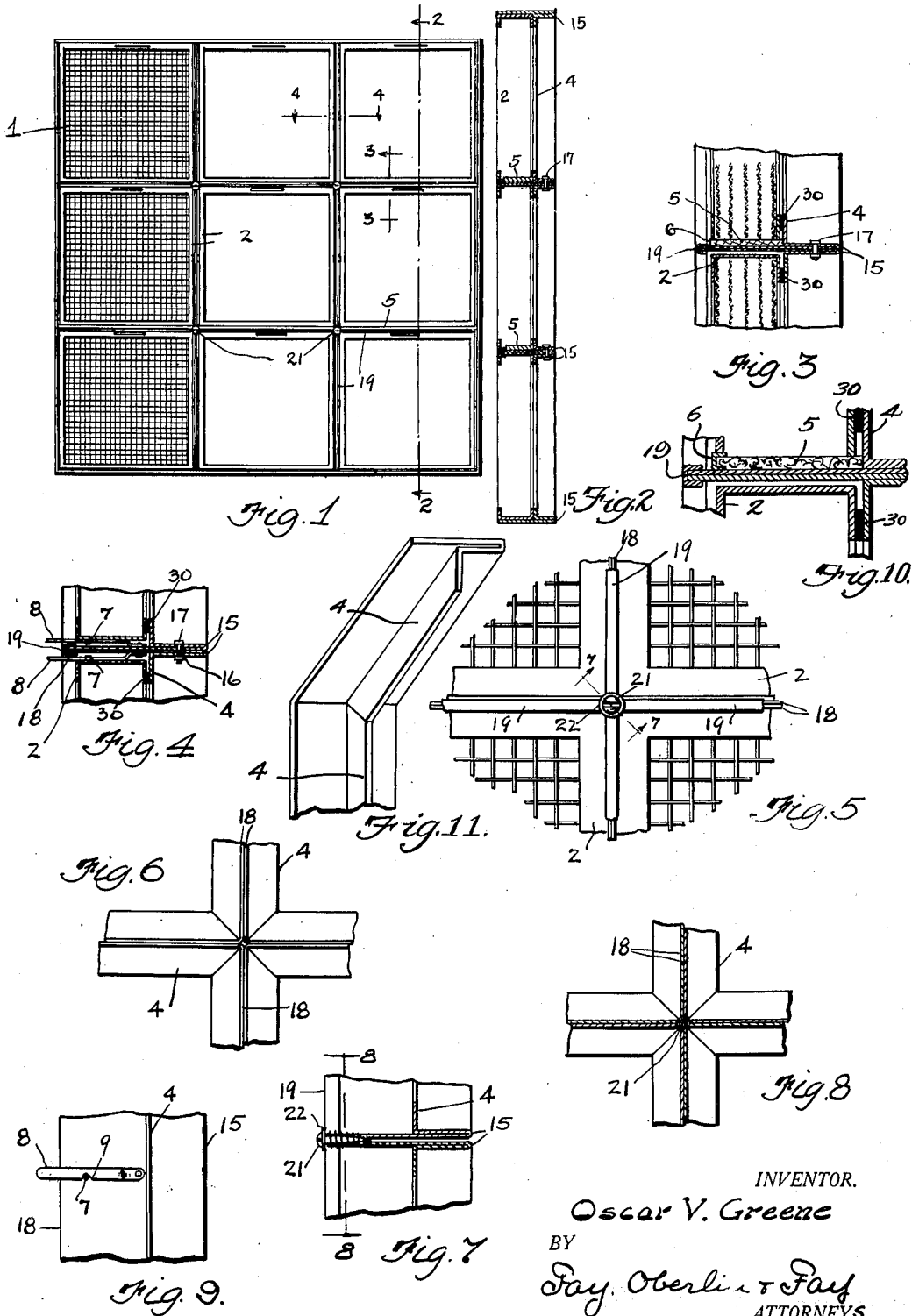
Feb. 18, 1930.

O. V. GREENE

1,747,364

FILTER CASING CONSTRUCTION

Filed March 18, 1925



INVENTOR.

Oscar V. Greene

BY

Day, Oberlin & Fay
ATTORNEYS

UNITED STATES PATENT OFFICE

OSCAR V. GREENE, OF CLEVELAND, OHIO

FILTER-CASING CONSTRUCTION

Application filed March 18, 1925. Serial No. 16,393.

The present invention relates to air or gas filter units and more particularly to the construction of the casings for the filter unit and the method of attaching the casings together. The object of the invention is to provide filter units which may be removably mounted in suitable housings or casings and which form a seal when in place to prevent air leakage around the filtering unit. Another object is to so form the unit and housing that the filter unit is provided with one or more open edges through which the dust and dirt may be removed and to make the open edge in such a manner that it is easily and completely sealed when the unit is mounted in the casing. Another object is the provision of means for attaching the casings together to form a bank and to provide attaching means which will seal the housing together, the means being so arranged as to allow the quick and easy removal of the units, both casings and filter units as desired. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—

Fig. 1 is a front elevational view of a bank of filter units mounted together; Fig. 2 is a sectional view on the line 2—2 of Fig. 1; Fig. 3 is an enlarged sectional view of a joint between two casings; Fig. 4 is a sectional view showing the locking members taken on the line 4—4 of Fig. 1; Fig. 5 is an enlarged front elevational view of the meeting area of four units; Fig. 6 is a view similar to Fig. 5 but showing the joint before the holding devices are applied; Fig. 7 is a diagrammatic view on the line 7—7 of Fig. 5; Fig. 8 is a sectional view on the line 8—8 of Fig. 7; and Fig. 9 is an elevational view of the inside of a unit showing the locking levers; Fig. 10 is a cross sectional detail view on an

enlarged scale similar to Fig. 3; and Fig. 11 is a perspective view of one of the structural elements showing the method of providing notches in a T shaped metal strip to provide for a right angle bend.

The present invention relates to air filters or gas filters of the general type shown in my United States Letters Patent No. 1,566,088 and No. 1,598,644, issued December 15, 1925, and September 7, 1926, respectively in which there is a filtering unit 1 mounted in a frame 2, the filtering material being composed of a series of spaced foraminous sheets secured in spaced relation in the frame. This framework seals three of the sides of the unit but leaves the bottom side open as best shown in Fig. 3. Each filter unit has a casing or housing which is a rectangular member preferably formed of a single flat sheet bent to shape so as to be an integral unit. Each side of this casing is formed with its rear edge rebent along the sheet and then turned inwardly at right angles to form an internal flange 4 in the interior of the completed casing. At the corners of the casing, a right angled notch is cut out of the flange 4 so that a mitered joint is formed where the cut ends of the flange come together, the meeting edges of the flanges 4 being preferably secured together by welding or brazing to form a continuous flange seal for the filter unit, as best shown in Fig. 11. Each side of the casing is thus T-shaped in cross-section with the leg of the T forming the internal flange 4 which is spaced between the front and back edges of the side of the casing. The ends of the single strip of metal from which the frame is made are also pressed or welded together. The interior bottom wall of the casing is provided with a sealing mat 5, which in its preferred form is a strip of cork linoleum fitting snugly between the side walls of the casing and against the internal flange. To secure the mat in place, it is provided along its front edge with a U-shaped metal reinforcing strip 6 which is adapted to be united with the casing by brazing, soldering or the like.

In order to make a tight seal between the filter unit frame 2 and the casing flange 4, the

latter is preferably provided with a resilient packing strip 30 preferably of felt along its sides and top against which the filter unit may be forced, the mat in the bottom of the casing forming a seal for the open bottom of the filter unit. The unit is held in place by means of two pins or lugs 7 carried on the side walls of the unit which are adapted to be engaged by locking levers 8 pivotally attached to the casing walls on the inside, the locking slots 9 in the levers being so shaped as to force the unit against the packing strips and the mat when the levers are moved into engaging position.

As shown in Fig. 1 the casings are rectangular and preferably square in shape and are adapted to be fitted together to form a large unit. In attaching the casings together, it is necessary to seal the joints between the casings. In the double rearwardly extending walls 15 of the casings, are formed aligned apertures 16 through which bolts 17 may be passed to secure the casings together and the bolts are easily removable if it is desired to remove or replace a casing. To seal the joints between casings, the front edges 18 of adjacent casings are locked together by means of U-shaped strips 19 which leave a small aperture at each joint 20 of four casings and these strips are locked in place at such joints by means of a metal screw 21 which is provided with a washer 22 under the screw head, the washer contacting over the ends of the four adjacent strips and securing them in place as well as sealing the aperture 20 between the casing corners.

By the present construction, the filter units are sealed in the casings and the casings are sealed together thus preventing the flow of air except through the filter units. The casings are so constructed that it is a simple matter to replace casings and the bolts or holding means are so placed as not to interfere with the filter units proper. The entire structure is so made that when fastened together it forms a rigid self supporting device and yet one which may readily be added to or changed as desired.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In a filter device, the combination of a plurality of individual filter frames, each consisting of a rectangular frame T shaped in section and having the leg of the T forming an inwardly extending flange between the edges thereof, means for securing said frames together and for sealing the same comprising securing means passing through adjacent

frame members on the one side of said flange, and sealing members adapted to cover the joint between the adjacent frames on the other side of said flange.

2. In a filter device, the combination of a plurality of individual filter frames, each consisting of a rectangular frame T shaped in section and having the leg of the T forming an inwardly extending flange between the edges thereof, means for securing said frames together and for sealing the same comprising securing means passing through adjacent frame members on the one side of said flange, and U-shaped members adapted to engage over the adjacent edges of the frame members on the opposite side of said flange to seal the joints between the frames.

3. In a filter device, the combination of a plurality of individual filter frames, each consisting of a rectangular frame T shaped in section and having the leg of the T forming an inwardly extending flange between the edges thereof, means for securing said frames together and for sealing the same comprising securing means passing through adjacent frame members on the one side of said flange, U-shaped members adapted to engage over the adjacent edges of the frame members on the opposite side of said flange to seal the joints between the frames, and locking means insertable at the corners of four adjacent frames for securing said U-shaped members in place.

4. In casings for filter units or the like, the combination of rectangular frames having inwardly extending flanges adapted to provide an abutment for the filter units, said flanges being provided with resilient means adapted to form cushion seals between said flanges and the filter units.

5. In a casing for a removable filter unit or the like, the combination of a rectangular frame formed of top and bottom members and side members T shaped in cross section to form a continuous interiorly extending flange between the front and back edges of the casing, the bottom member of the casing being provided with a sealing mat on which the filter unit is adapted to rest so as to form an air seal between the bottom of the filter unit and the casing.

6. In casings for filter units or the like, the combination of rectangular frames having inwardly extending flanges adapted to provide an abutment for the filter units, said flanges being provided with resilient means adapted to form cushion seals between said flanges and the filter units, and locking means for holding said units tightly against said resilient means.

7. In a casing for a removable filter unit or the like, the combination of a rectangular frame having inwardly extending flanges adapted to provide an abutment for the filter unit, resilient packing strips mounted on said

inwardly extending flanges and interengaging means on said frame and unit to secure said unit in position against said resilient packing strips to seal the unit against air leakage.

5 8. In a casing for a removable unit or the like, the combination of a rectangular frame having inwardly extending flanges adapted to provide an abutment for the filter unit,
10 resilient packing strips attached to the side and top flanges of said frame, a sealing mat mounted on the bottom member of said frame and locking means for holding said element
15 against said packing strips and on said mat to form an air seal between the filter unit and the frame to prevent the passage of air therebetween.

Signed by me this 13th day of March 1925.

OSCAR V. GREENE.

20

25

30

35

40

45

50

55

60

65