

Nov. 18, 1924.

W. M. CROSS

1,515,661

COMPOUND PLUG

Filed Feb. 18, 1920

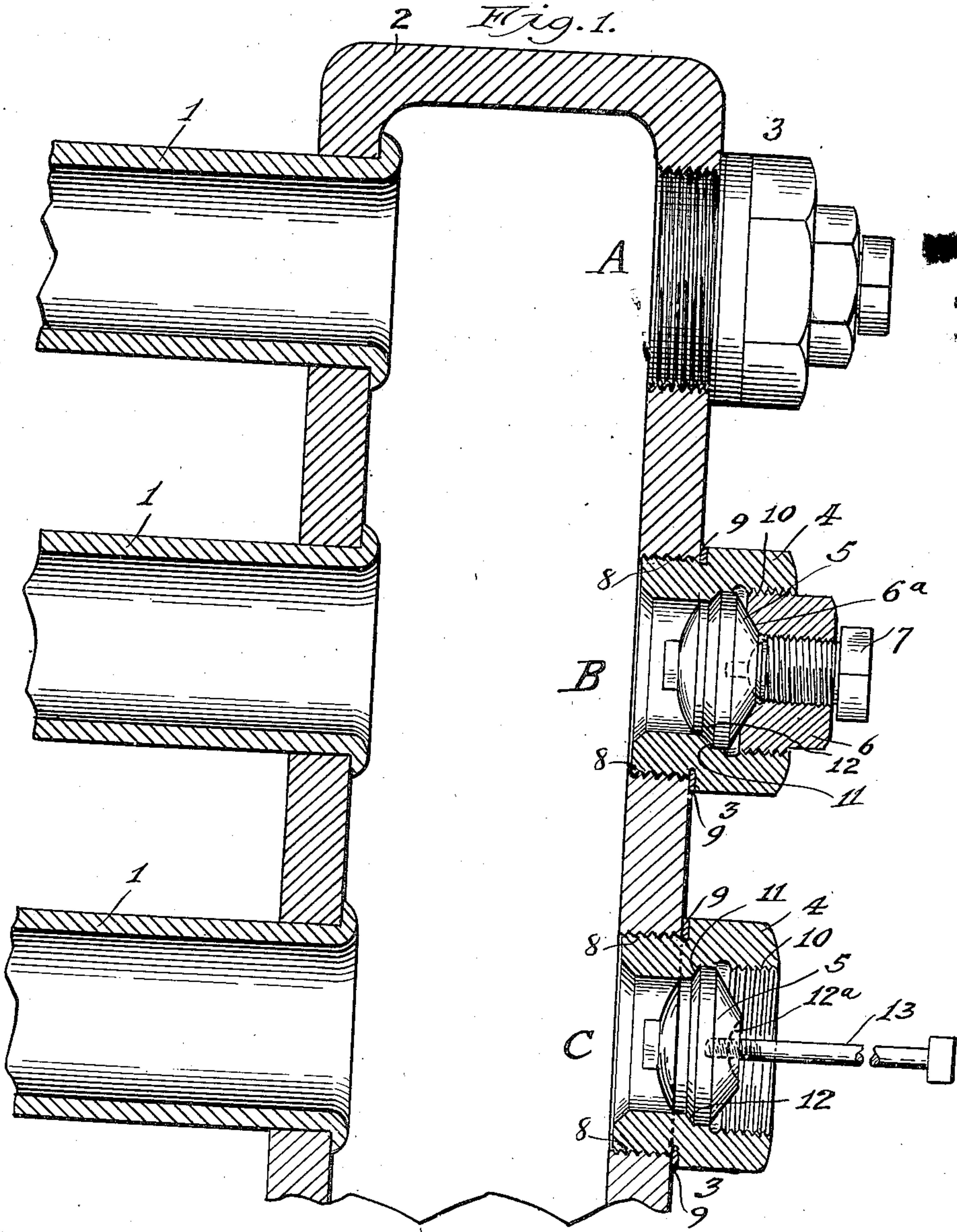
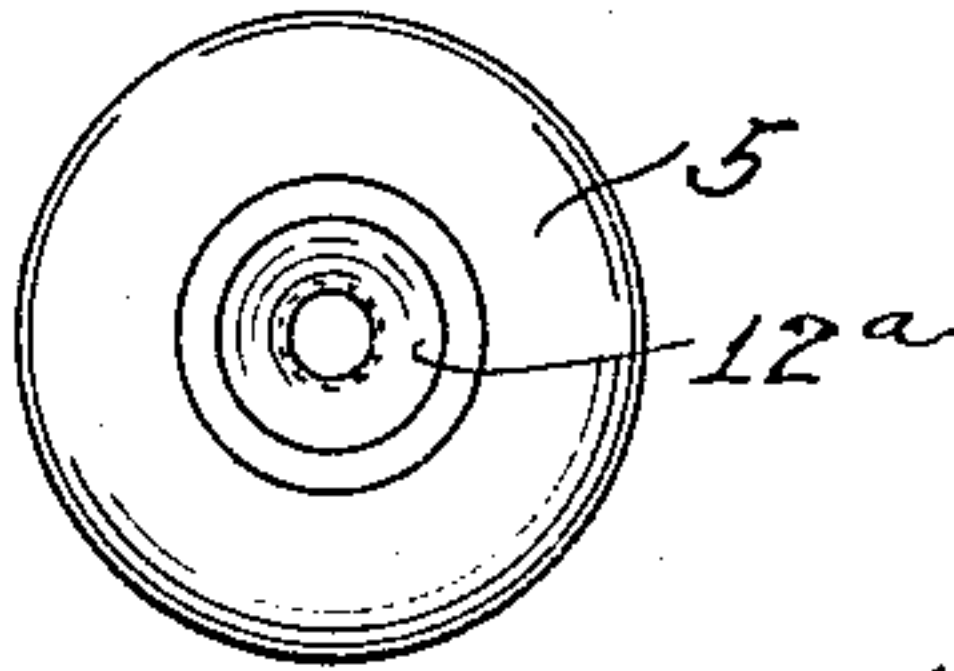


Fig. 2.



Witness,
S. J. Mann

Inventor,
Walter M. Cross.
By Frank L. Belknap Att'y.

Patented Nov. 18, 1924.

1,515,661

UNITED STATES PATENT OFFICE.

WALTER M. CROSS, OF KANSAS CITY, MISSOURI.

COMPOUND PLUG.

Application filed February 18, 1920. Serial No. 359,642.

To all whom it may concern:

Be it known that I, WALTER M. CROSS, a citizen of the United States, residing in Kansas City, county of Jackson, and State of Missouri, have invented certain new and useful Improvements in Compound Plugs, of which the following is a specification.

My invention relates to improvements in compound plugs and refers more particularly to a type of plug adaptable to boilers, pipe coils or the like where pipes or flues must be opened to be cleaned.

Among its salient objects are to provide a plug constructed in sections or parts, it being necessary to remove the entire plug only when a tube or pipe is to be replaced, the removal of the inner members of the plug permitting easy access to the tubes or pipes to be cleaned; to provide a plug which may be easily removed irrespective of the heat to which the system (of which it is a part) has been subjected or the character of the material or substance treated therein; to provide a plug that eliminates the inconvenience and difficulties attending the removal of the common type of plug and one that obviates the dangers accompanying stripped or disintegrated threads usual in plugs commonly used where heat and pressure are concerned; to provide a plug that is comparatively cheap in construction and invaluable as regards safety and ease of insertion and removal and in general to provide a plug of the character referred to.

In the drawings:

In Fig. 1 at A is shown the plug in side elevation screwed into a pipe coil header. At B is shown a like plug in cross section. At C is shown the plug in cross section with the head screw and plug nut omitted and a hand bolt inserted for removing the obturator.

Fig. 2 is a face view of the obturator.

In all types of boilers, pipe coils or heating means where tubes are used for the purpose of heating liquids or vapors, it is common to have some provision for the cleaning of the tubes or pipes. The most usual means in this type of equipment are pipe plugs which are threaded and inserted in the ends of the respective tubes or in the headers which connect the tubes. Where a high degree of heat is used in any particular process and where pressure is concerned, difficulties are encountered with these plugs, both with their removal and the danger ac-

companying the disintegration and stripping of the threads, due to the action of the liquids or vapors upon the threaded portion and the force required in inserting the plugs to make them gas or liquid-tight.

Referring in detail to the drawings, the pipes 1 are connected to a header 2 in which are shown three plugs considered as a whole at 3 and placed in a position so that when they are removed the pipes directly opposite them may be cleaned.

The plug 3 comprises a bushing 4, obturator 5, plug nut 6 and a head screw 7. The bushing 4 is threaded externally at 8 and is adapted to be screwed into the header 2. It is unnecessary to remove this bushing from the header except when one of the tubes is to be removed therefrom. A gasket 9 is placed between the header and the bushing to assure a gas-tight joint. At 10, the bushing is internally threaded to receive the nut 6. A bevel seat 11 is ground into the interior of the bushing at any suitable angle and is adapted to receive the obturator member 5, which is similarly ground at 12 to fit the seat within the bushing. This obturator is bored and threaded to receive the removing bolt 13, which is used to remove the obturator after the plug nut and head screw have been taken from the bushing. At this time, it is only necessary to tap the removing bolt so that the obturator will be broken from its seat.

The plug nut is externally threaded to be screwed into the bushing and bevelled at 6^a to force the obturator firmly upon its ground seat. It is internally threaded to receive the head screw 7, which extends through the plug nut and sets against the grooved portion 12^a on the surface of the obturator, thereby assisting the plug nut in seating the obturator and preventing the backing off of the plug nut from the outer bushing. When it is necessary to clean the tubes, the head screw and plug nut may be easily removed as they are not subjected to the heat and pressure of the system and consequently their threads are not affected by the same amount of contraction and expansion and other disintegrating factors as the threads of the outer bushing. After the removal of these holding members the removing screw 13 is screwed into the obturator and the latter easily broken from its ground seat within the bushing. These members may be removed by hand, no

matter what conditions of heat and pressure the system has been subjected to and obviate the necessity of powerful machines commonly used in pressure processes for removing cleaning plugs from stills and pipe coils.

I claim as my invention:

1. A removable closure for tube headers comprising a closure member adapted to be seated in a cleaning aperture, a holding member positioned behind the closure member for holding the same in place, means on the interior of the cleaning aperture by which the holding member is held, and a second holding member screw-threaded into the first holding member.

2. A removable closure for pipe or tube headers comprising a removable closure member adapted to be seated in a cleaning aperture, double holding members positioned behind the closure member for holding it rigidly in position, and means on the interior of the cleaning aperture by which one of the holding members is held in position.

3. A removable closure for pipe and tube headers comprising a removable closure member adapted to be seated in a cleaning aperture, holding members positioned behind said closure member, and means on the interior of the cleaning aperture to which one of the holding members is attached, one of said holding members contacting said closure member to hold it in position, the other of said holding members being adapted to impose additional pressure upon the closure member and hold it rigidly on its seat.

4. A compound plug of the character described, comprising a bushing externally

threaded at one end and internally threaded at the other, having a bevelled seat ground upon its inner surface intermediate its ends, an obturator having a similarly ground seat and adapted to seat within the bushing, a plug nut externally threaded to be screwed within the bushing and to hold the obturator firmly upon its seat, a head screw adapted to hold the obturator in place and prevent the loosening of the plug nut.

5. A compound plug of the character described, comprising a threaded bushing adapted to be screwed in a pipe or header, an obturator seated therein, a plug nut screwed into the bushing and adapted to hold the obturator in position, a head screw passing through the plug nut setting against the obturator and preventing the plug nut from backing off.

6. A compound plug of the character described, comprising an outer bushing threaded externally at one end and internally on the opposite end and having a seat intermediate of its ends, an obturator adapted to be seated thereon, a plug nut, internally and externally threaded, screwed into the internal threads of the bushing and set against the obturator, a head screw screwed into the plug nut and set against the obturator.

7. A plug of the character described, comprising an obturator having a seat upon its surface and adapted to be set in the cleaning holes of a pipe coil, a plug nut adapted to hold the obturator in position, a head screw passing through the plug nut setting against the obturator and preventing the plug nut from backing off.

WALTER M. CROSS.