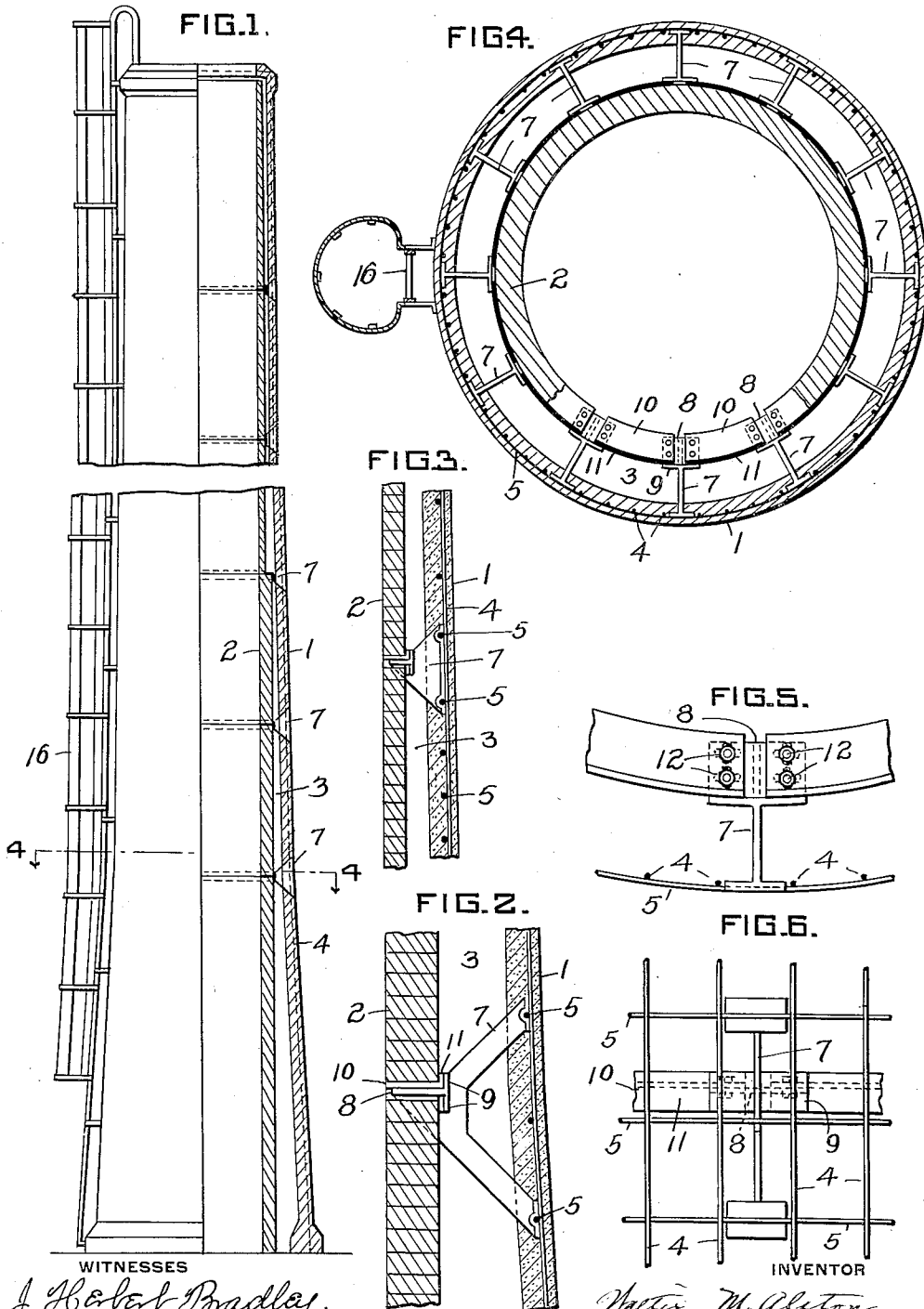


1,344,608.

Patented June 29, 1920.



WITNESSES

J. Herbert Bradley.

INVENTOR

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UNITED STATES PATENT OFFICE.

WALTER M. ALSTON, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO THE BAKER-DUNBAR-ALLEN COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CONCRETE STACK.

1,344,608.

Specification of Letters Patent. Patented June 29, 1920.

Application filed January 9, 1919. Serial No. 270,279.

To all whom it may concern:

Be it known that I, WALTER M. ALSTON, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have
5 invented a new and useful Improvement in Concrete Stacks, of which the following is a specification.

This invention relates to chimneys or stacks and particularly to large chimneys
10 and stacks such as used at power plants and with furnaces of various kinds.

The object of the invention is to provide a chimney or stack having an external permanent shell and an internal lining supported from said external shell in a manner
15 to permit of its ready renewal, the whole structure forming a stack or chimney which is strong, economical to erect and easy to repair.

In the accompanying drawing, Figure 1 is a sectional elevation of a stack embodying the invention; Figs. 2 and 3 are vertical
20 sectional views of portions of the stack on an enlarged scale to more clearly show the construction; Fig. 4 is a horizontal section on an enlarged scale taken on the line 4-4,
25 Fig. 1; Fig. 5 is a plan view and Fig. 6 an outside elevation showing the means for supporting the lining.

The improved stack comprises the outer shell, or stack proper 1, and the internal lining 2 supported from the outer shell, and
30 with an air space 3 between the same.

The stack proper is constructed of concrete or other cementitious material, and preferably has embedded therein suitable metal reinforcements, shown as consisting of vertical rods 4 and horizontal bands 5,
35 but obviously various forms of metal reinforcement will answer the purpose. This outer shell is preferably formed of the cementitious mixture known as "gunite" which as known is a mixture of cement and sand with water, and is applied by means
40 of a so-called "gun" which, by means of compressed air or the like, forcibly sprays the cementitious mixture in place, the force used being sufficient to eliminate the moisture almost instantly, as a consequence of
50 which the mixture sets very rapidly. To construct this outer shell a suitable internal form will be provided, with the reinforcement placed around same, and the "gunite" is then applied by means of the "gun," be-

ginning at the bottom and working upwardly,—the "gunite" being applied until a wall or shell of the desired thickness is formed; and as the composition sets very rapidly the structure becomes self-supporting as it is built up. The reinforcement
60 will be erected in sections, and the internal form will be raised from section to section as it is being constructed,—the section under construction being supported entirely by the sections below.

Before applying the "gunite," suitable internal brackets are secured to the reinforcement and become embedded in the cement when it is applied. These brackets are indicated by the reference numeral 7, and
70 they project inwardly beyond the inner face of the outer shell, preferably to varying distances,—those at the lower portion of the stack projecting inwardly farther than those at the top of the stack so that the internal lining is substantially vertical, while
75 the stack proper is preferably tapered as shown. These brackets are provided at their inner ends with horizontal ledges 8 and upwardly and downwardly projecting
80 flanges 9, and serve to support annular members on which the lining 2 is erected. These annular members are formed by a series of segmental plates 10, provided at their outer edges with upwardly and downwardly projecting flanges 11, and have their
85 ends supported on and secured to the horizontal ledges 8 on the brackets. To allow for expansion and contraction, the securing means is so arranged as to permit radial
90 movement of the supporting plates 10. This is obtained by securing the plates 10 to the brackets 7 by means of bolts 12 extending through elongated holes in the plates and brackets, the holes in the brackets having
95 their long axes extending radially of the stack and the holes 14 in the plates having their long axes extending circumferentially of the stack. This allows a limited movement of the plates.

The internal lining 2 is preferably formed of fire or other brick and is erected in sections, the lowermost section resting upon the foundation while each section thereabove rests upon and is supported by one of
100 the annular supports formed by a series of plates 10. As a consequence, any section of the lining can be torn down and rebuilt
105

without destroying the entire lining, so that the lining can be readily and cheaply repaired when necessary.

The reinforced outer shell or stack proper is comparatively thin but nevertheless exceedingly strong and its method of erection does not require expensive scaffolding and forms, thus making its erection relatively cheap. The internal lining is spaced from the outer shell and consequently can expand or contract independently of the outer shell, and since it is built up in sections, each independently supported, it can be quickly and economically repaired.

The stack can have applied to it any suitable ladder, such as shown at 16. Supports for it will be anchored to the reinforcement before the cement is applied.

I claim:

1. A stack or chimney comprising an outer unitary self-sustaining shell of cementitious material, inwardly-extending annular brackets supported by said shell at vertical intervals thereof, and an internal lining formed in sections each supported by

one of said brackets, whereby said outer shell forms the sole support for itself and for said lining sections.

2. A stack or chimney comprising an outer unitary self-sustaining shell of reinforced cementitious material, inwardly-extending annular brackets having their outer ends embedded in said shell at vertical intervals thereof, and an internal lining formed in sections each supported by one of said brackets, whereby said outer shell forms the sole support for itself and for said lining sections.

3. A stack or chimney comprising an outer shell of cementitious material, a plurality of annular series of brackets embedded therein, supported thereby and extending inwardly therefrom, supporting plates held by said brackets and movable radially thereon, and lining sections erected on said plates.

In testimony whereof, I have hereunto set my hand.

WALTER M. ALSTON.