

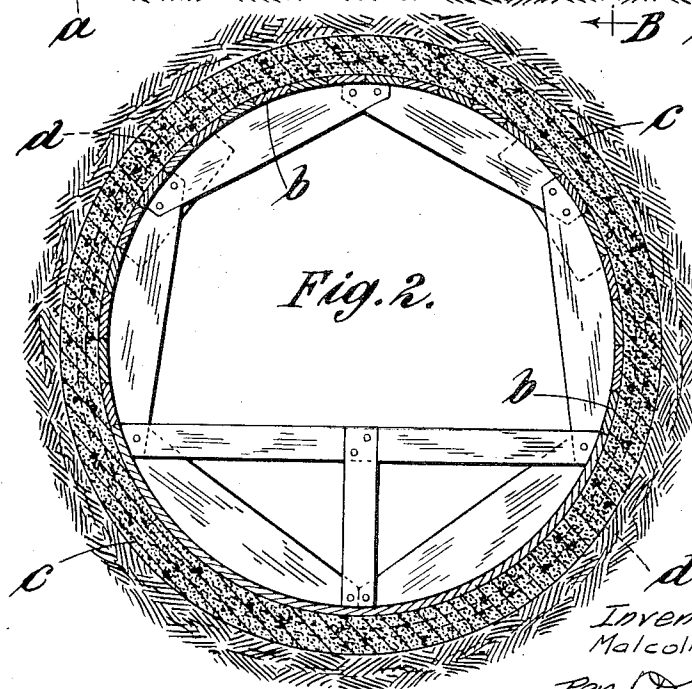
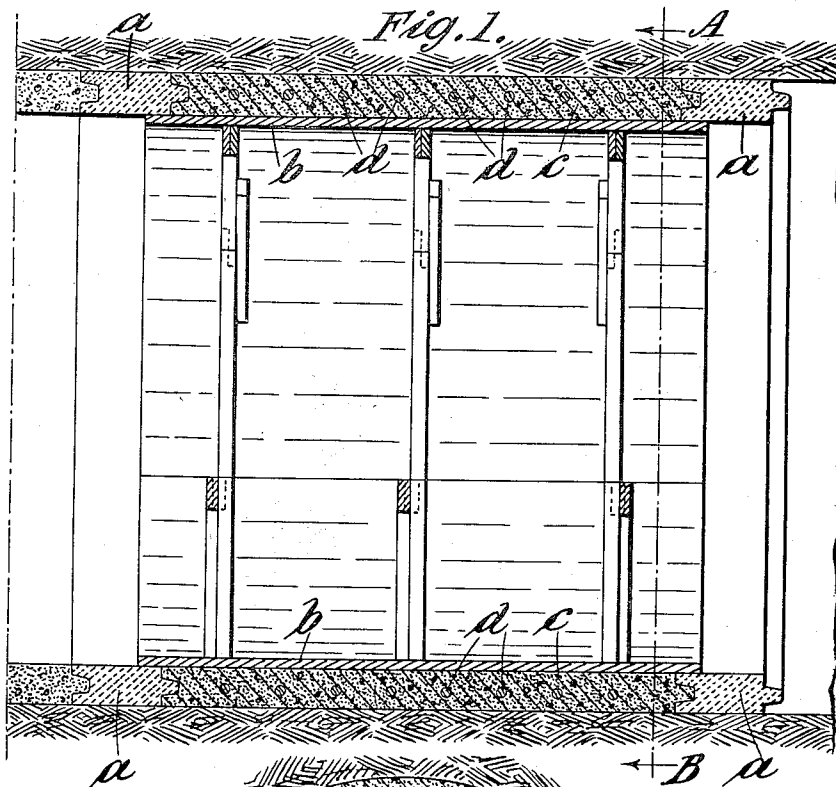
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METHOD OF LINING TUNNELS, SHAFTS, OR THE LIKE

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METHOD OF LINING TUNNELS, SHAFTS, OR
THE LIKE

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1 Claim. (Cl. 61—45)

This invention relates to the improved method of lining tunnels, shafts or the like.

The object of the invention is the construction of a tunnel of relatively less cost with greater facility and celerity than has been obtained in the past owing to the large amount of mass concrete used.

This invention consists in the method of building and reinforcing the walls of tunnels, shafts and the like in which two complete rings in segments in concrete or the like having tongued and/or grooved sides and ends are built in the excavation of the tunnel or shaft a given distance apart from one another, supporting in said rings movable tubular shuttering formed of removable segments adapted to be collapsed to a smaller peripheral dimension than the tunnel diameter and casting between said rings a concrete monolith structure to coincide with the internal periphery of the rings which keys into the tongues and/or grooves in the sides of the two rings at the ends of the monolith, and while the concrete of the monolith structure is setting building another segmental ring at a given distance in advance to support the forward end of the shuttering when said shuttering is slidably removed to the advanced position for casting the next section of the monolith structure. The shuttering segments are so constructed that an unobstructed passage way exists therethrough to enable the material excavated to be transported outwards and the segments for the supporting rings to be carried inwards for erection.

In order that the invention may be the better understood I will now proceed to describe the same in relation to the accompanying drawing, reference being had to the letters and figures marked thereon. Like letters refer to like parts in the various figures in which:—

Figure 1 is a longitudinal section of a tunnel constructed in accordance with this invention, and

Figure 2 is a transverse vertical section of the same.

In accordance with this invention the structure is started by the erection of two rings *a* of tongued and/or grooved segments a certain distance apart, say six feet; when these are in position a tubular shuttering *b* of a collapsible character is erected so that its ends are supported in the two rings *a* installed and then concrete *c* is disposed behind the shuttering *b* through suitable passages so as to form a concrete monolith in situ between the two rings *a* initially placed in position and having an internal periphery which coincides with that of the rings. While the concrete is setting, another ring *a* can be placed in an advanced position so that when the concrete is set the shuttering *b* can be collapsed by removing the bolts *e* and one or two shutter boards *f* and slidably removed to the advanced position for casting the next monolith where it can be expanded again with the boards *f* and bolts *e* reinstated. It is obvious that reinforcing members *d* can be disposed behind the shuttering *b* which will be surrounded by the concrete *c* when such is filled in at the back of the shuttering *b*.

I claim:—

An improved method of lining tunnels, shafts and the like with cementitious material consisting of building in the excavation two rings of tongue and groove jointed segments a given distance apart from one another, said rings having keying means at each end surface, inserting in said rings a collapsed open centered shuttering element of a length to span the space between the rings, expanding the shuttering element to be supported by said rings, casting concrete in the space behind the shuttering and between the tongued and grooved ring ends, building another ring in an advance position in the excavation, collapsing and removing forwardly the shuttering to said advanced position, and expanding said shuttering into the rings supporting it ready for the next casting operation.

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