

J. N. D. BROWN.
RAILWAY ROAD BED AND TRACK CONSTRUCTION.
APPLICATION FILED OCT. 22, 1910.

987,041.

Patented Mar. 14, 1911.

4 SHEETS—SHEET 1.

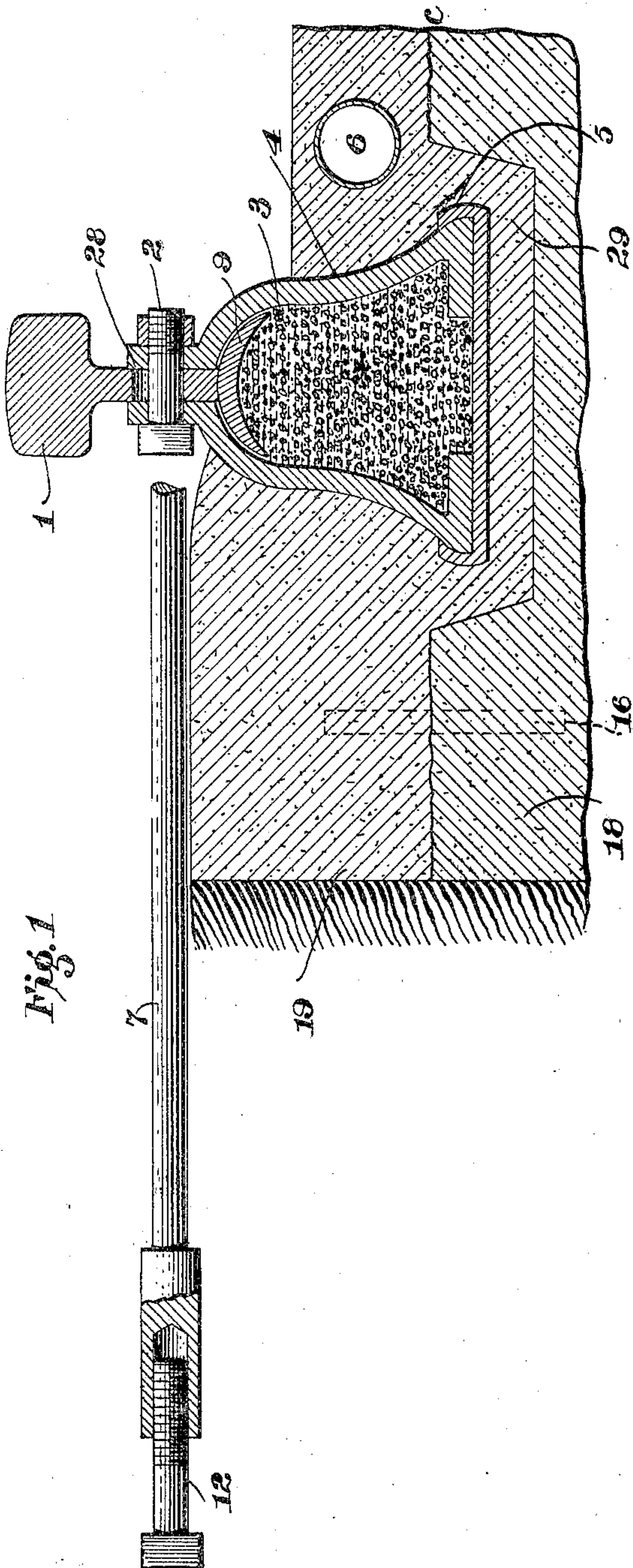


Fig. 1

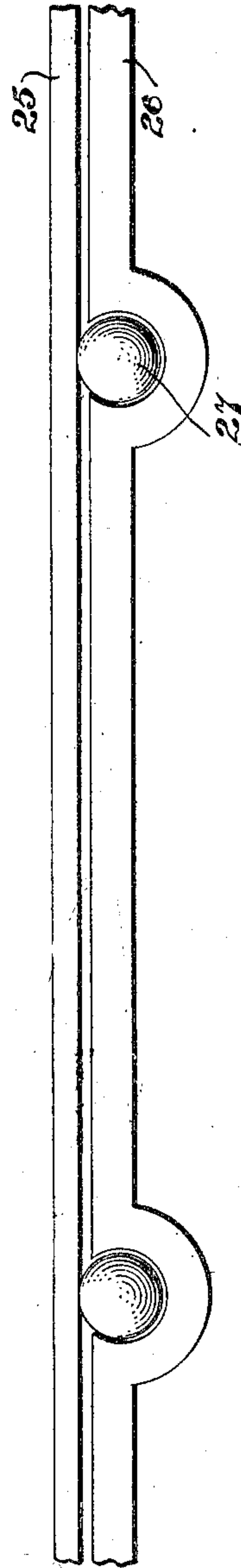


Fig. 2

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H. E. Smith

Inventor:

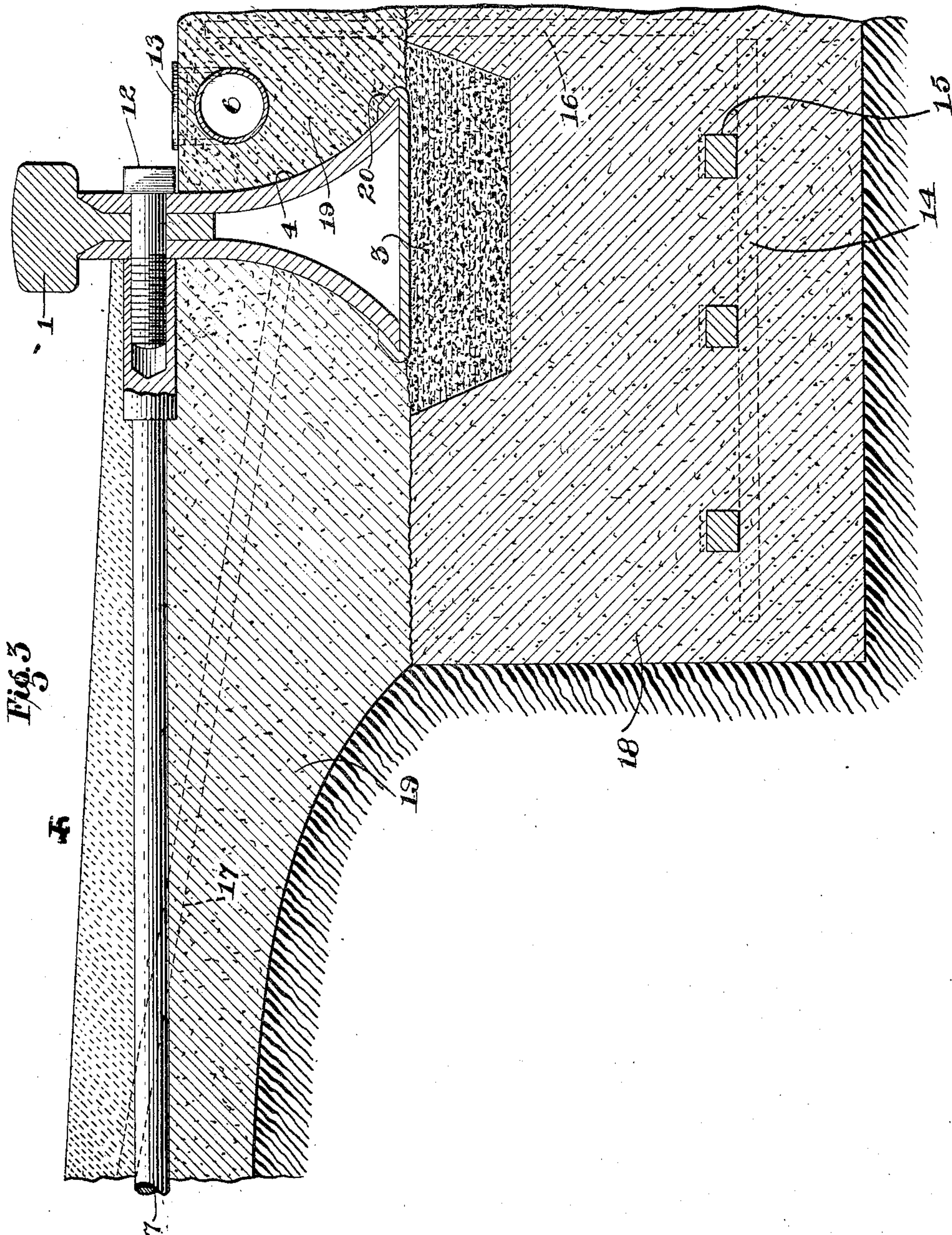
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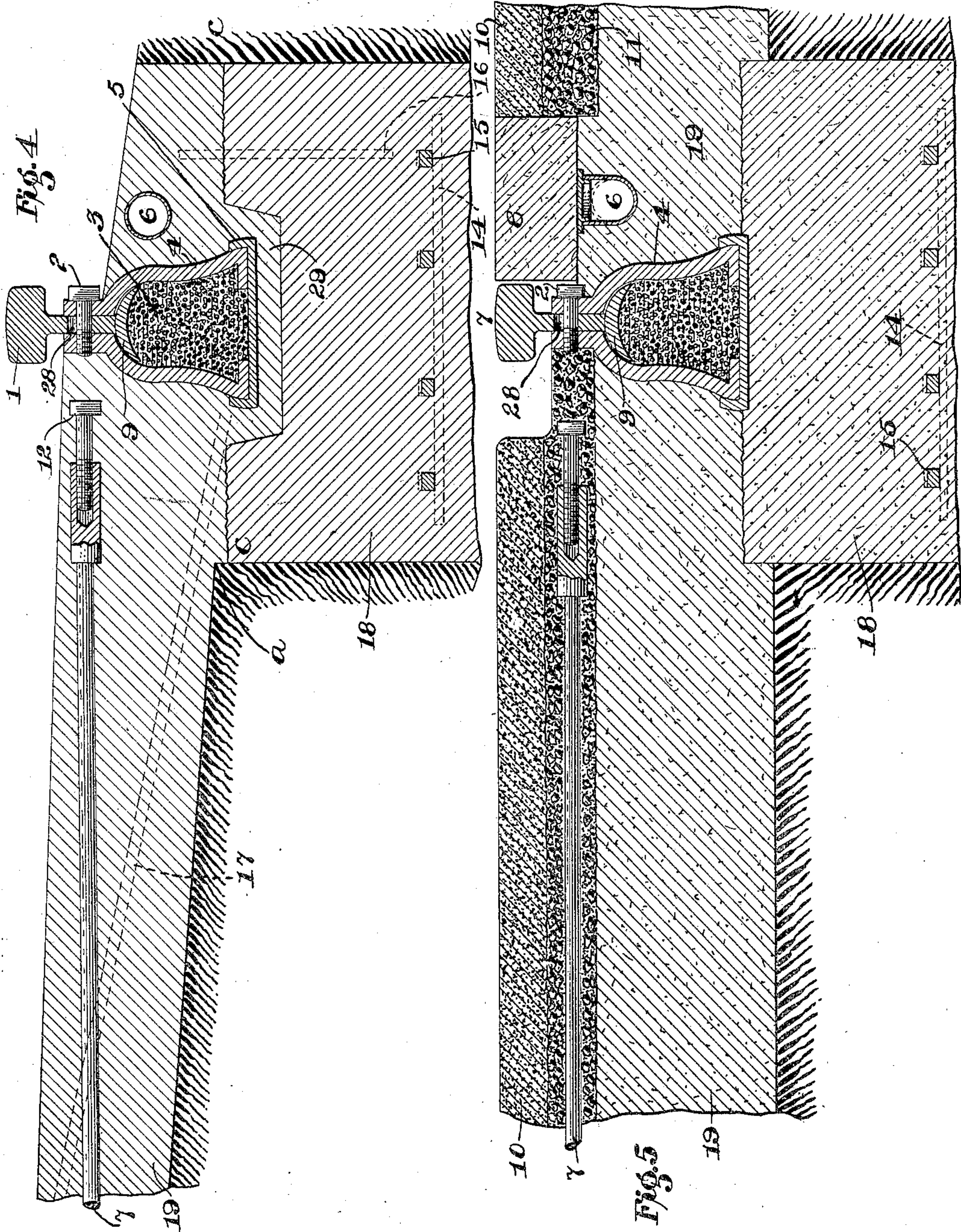
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Witnesses:
O. J. Stephenson
N. E. Sutter

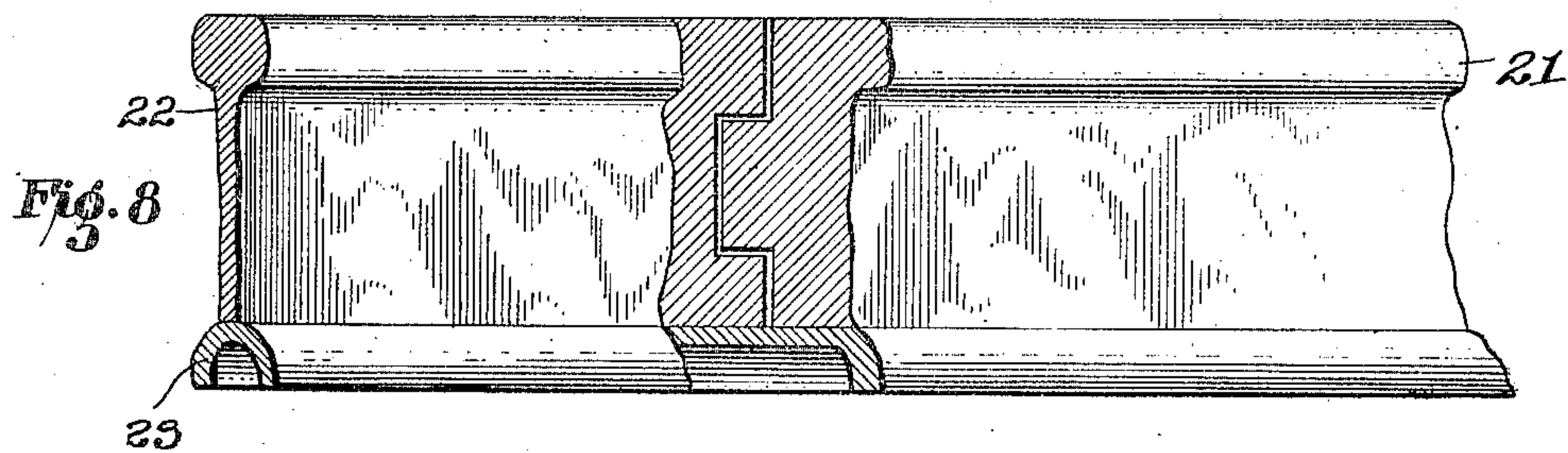
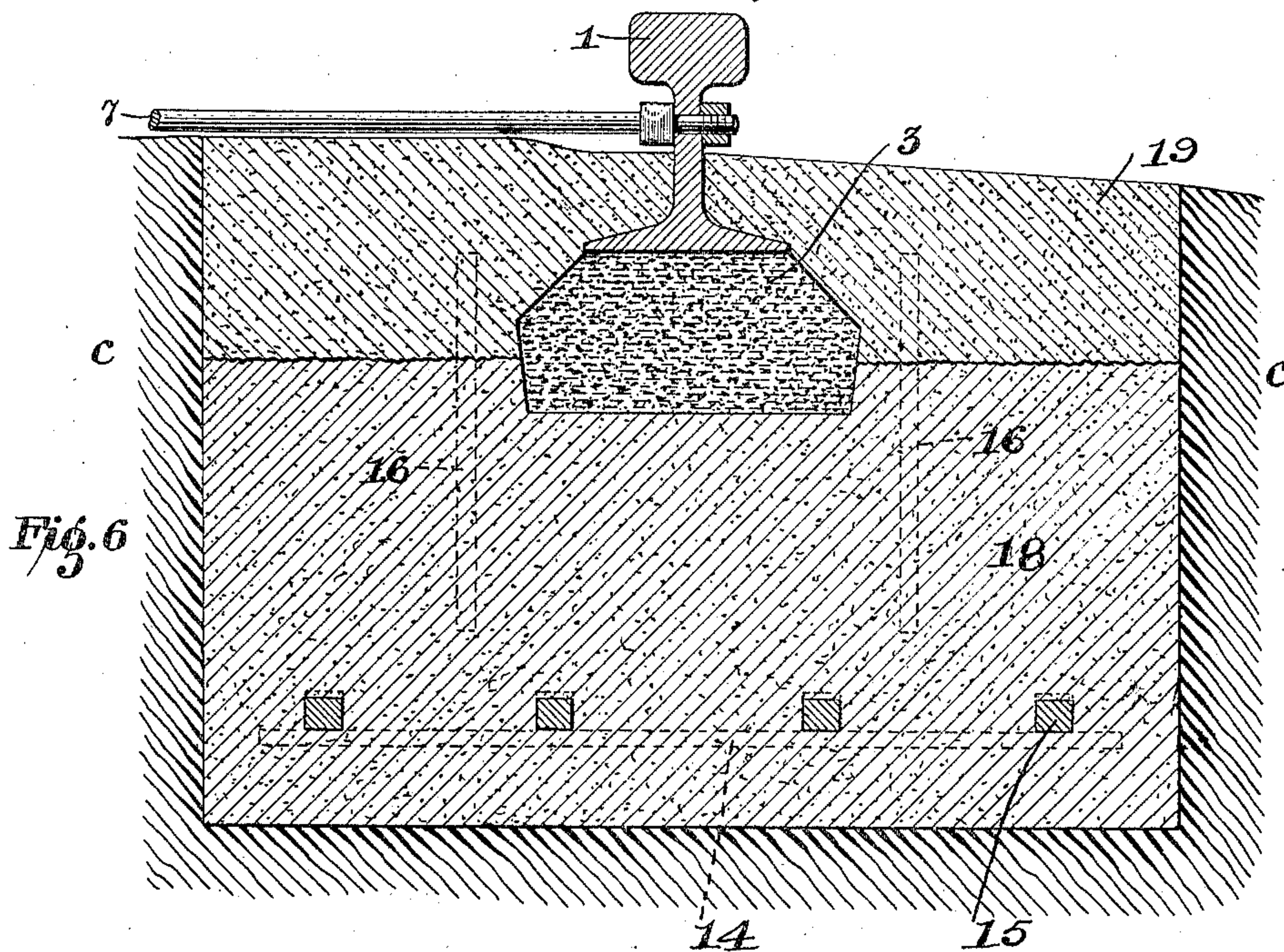
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UNITED STATES PATENT OFFICE.

JOHN N. D. BROWN, OF ANADARKO, OKLAHOMA.

RAILWAY ROAD-BED AND TRACK CONSTRUCTION.

987,041.

Specification of Letters Patent.

Patented Mar. 14, 1911.

Application filed October 22, 1910. Serial No. 588,572.

To all whom it may concern:

Be it known that I, JOHN N. D. BROWN, a citizen of the United States, and a resident of Anadarko, Caddo county, Oklahoma, have invented certain new and useful Improvements in Railway Road-Bed and Track Construction for All Classes of Railways, of which the following is a specification.

My invention relates to improvements in road-bed and track construction for railways; and the object of the invention is to provide such a permanent construction as will eliminate the use of wood or other perishable materials and yet be simple and economical of construction; and it consists chiefly in concrete, steel reinforced, having a cushion material embedded in the same upon which the rail or rail-shoe rests, the particular arrangement and construction being hereinafter more particularly described.

Figure 1 is a vertical section of one side of road-bed and track. Fig. 2 is a vertical section of a ball-bearing switch rail. Fig. 3 is a vertical section of one side of road bed and track with cushion under a modified form of shoe. Fig. 4 is a vertical section of one side of road-bed and track showing shoe with cushion within the same. Fig. 5 is an adaptation of Fig. 4 to street railway construction. Fig. 6 is a vertical section of road-bed and track when the present form of rail is used. Fig. 7 is a vertical, lineal section of steel reinforcing. Fig. 8 is a perspective view of rail used.

Like numbers of reference indicate corresponding parts in each figure.

1 is the upper or wearing part of rail.

2 represents the bolts that clamp the rail in the shoe.

3 is the cushion material which may be an asphalt and sand mixture, substantially the same as that used for the surfacing coat of asphalt pavement; or it may be wood fiber about the size of wheat straw, tied in small bundles, saturated with crude oil or residuum and embedded in the asphalt mixture as above; or dry saw dust saturated with crude oil or residuum may be used in the place of sand in the asphalt mixture; or wood or vegetable pulp saturated with oil, as above, may be used; or any other cheap imperishable material suitable for such a purpose may be used. The cushion material should be rolled or pressed into the rail

shoe while hot or rolled and pressed into a suitable form while hot.

4 represents the curved steel plates forming the principal parts of the shoe and providing, by their peculiar form, resiliency; the thickness of these plates would vary according to the requirements of the construction and the judgment of engineer in chief, and the same would be true of other parts of the construction.

5 in Figs. 1, 4 and 5 represents narrow steel clamps some four feet apart.

6 is a conduit for wires.

7 represents tie rods which are placed as high up as possible to counteract all outward strain of the rails, and should be of the form of Fig. 7 to reinforce the concrete between rails.

8 in Fig. 5 is a vitrified brick placed along the outside of rails in a construction for street railways when streets are paved with asphalt, and provides a means of getting at the bolts or cover of manhole to conduit.

9 is the continuous curved steel cap resting on cushion and supporting the rail.

10 is the surfacing coat of asphalt pavement.

11 is small crushed stone and asphalt put on the concrete before the surfacing coat is applied.

12 represents tie-rod bolts that take the place of bolts (2) every four to six feet.

13 is the cover over manhole to conduit.

14—the broken lines represent three-eighths steel reinforcing placed about two inches from the bottom of stringers.

15 represents the lineal reinforcing of stringers and is placed low down where it will do most good; this reinforcing should be seven-eighths to one inch square and of the form indicated in Fig. 7, and should be either lapped for one foot at the ends or one end should be a hook and the other end an eye and thus joined together—(scatter the joints).

16 is vertical reinforcing steel three-eighths to five eighths of an inch square, and placed about one foot apart; the object is to bind the concrete above the wavy line *c, c*, to that below the same.

17 is five-eighths steel reinforcing extending across the track from rail to rail. Instead of placing it as shown in Fig. 4 I would fill in more concrete at the angle *a* and bring it down below the depression under the shoe and carry it over and hook

it around vertical reinforcing (16) and at the center of track near (7) run five-eighths square, reinforcing lengthwise of track and on top of tie rods (7) and bring the center of 17 immediately under same and wire or clamp it thereto. I would place this reinforcing from one foot to six feet apart according to the character of the earth road-bed.

18 represents the reinforced concrete base or stringer that would be the first thing installed; it should have a depth of from eight to eighteen inches below the wavy line *c, c*, and a width of from fourteen inches to two feet, all according to the character of the earth road-bed. The bottom of the trench for this stringer should be well tamped and if wet and spongy should be dug deeper and the deeper part filled with dry clay or broken stone.

19 represents all that part of the construction that would be installed after the track, complete, was placed; this part of the construction should be finished with a one inch coat of sand and cement (two parts sand and one part cement) put on before the concrete has taken its final set and should be troweled down smooth.

20 in Fig. 3 represents the continuous steel bottom of this style of shoe.

21 in Fig. 8 is the crown or wearing surface of the rail; 22 in same figure (8) represents the shank or web of rail; 23 in same figure (8) represents the continuous, curved steel cap that rests on cushion and supports rail as shown in Figs. 1, 4 and 5. 24 shows how this style of rail is joined at the ends.

25 Fig. 2 represents the bottom part of shoe which for this purpose would have a continuous bottom instead of the clamps (5).

26 represents a lineal, vertical section of a ball-bearing steel plate for a switch rail to use in connection with rail and shoe as shown in Figs. 1, 4 and 5 or it may be used with any style of rail or shoe; this plate should be embedded in concrete and of sufficient width at movable end of rail to permit the rail to travel some six inches and would be operated in the usual manner.

27 is the steel balls that carry the rail and shoe.

28 calls attention to the holes in the shank or web of rail through which the bolts pass as in Figs. 1, 4 and 5; these holes whether round or square (preferably square) should be three eighths to one half inch larger than the bolts and should be so placed that the center of the bottom of hole will touch the center of bottom of bolt, this to provide for possible compression of cushion and for expansion and contraction.

29 shows the cavities in the stringer or base under the shoe which as in Figs. 1 and 4 or in Figs. 3 and 6 shown filled with the cushion, should be formed before the

concrete sets by pressing a proper shaped plank or timber down into same and should be spaced and lined up same as the rail; when setting the shoe or cushion when used under shoe or rail a small quantity of very soft cement (sand two parts and cement one part) should be poured into the cavity to provide a perfectly uniform base for shoe or cushion. In Fig. 3 the concrete should be kept clear from the bottom of tie rod (7) to near the center of track to allow for the springing of the curved steel of shoe or the compression of cushion.

To connect the shoe when it contains the cushion as in Figs. 1, 4 and 5 I would provide a subshoe, a steel plate eighteen inches long and of sufficient width, when formed, to fit outside of shoe up to the vertical part of neck of same; this would protect the cushion at the joints of shoe and prevent the same from being forced out by compression. The modified form of shoe as shown in Fig. 3 would be joined at ends by a steel plate eighteen inches long and of the form of outside of bottom of shoe.

For drain of rain, snow or flood water from between the rails I would provide for bringing the concrete in Figs. 3 and 4 up as high on the neck of shoe as practicable and giving it a dip of about one inch to center of track and conducting the water from center of track through three inch sewer pipe down and out under the stringer or through the stringer when necessary, placing said sewer pipe at such intervals as the conditions of earth road-bed would require.

I have thus described my invention of a novel, simple, practical and economical construction; one in which one cubic yard of reinforced concrete will construct one lineal yard of road-bed as required and shown by Figs. 3 and 4 (a much less quantity would be required by Figs. 1 and 6) while in existing main line construction as much as two cubic yards of crushed stone is used for ballast per lineal yard of track. When the signal system is used I would provide that the signal wires be strung directly under the rail and within the cushion as shown in Figs. 1, 4 and 6 or within the shoe as in Fig. 3.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. The combination in a railway road-bed and track construction of parallel steel-reinforced concrete stringers with a rail-shoe embedded in the same having a vertical part extending above the concrete, a cushion material inclosed in said rail shoe, a curved steel cap within the rail shoe resting on said cushion and taking the place of the base of the present form of rail, a rail with the web of same resting on said curved steel base and bolted between the projecting parts of

said shoe, and having enlarged bolt holes in the web to provide for compression of cushion and unequal expansion and contraction of rail and rail-shoe, and having metal tie-rods provided at intervals to take the place of bolts and hold the rails in gage, as and for the purpose specified.

2. The combination in a railway road-bed and track construction of parallel steel-reinforced concrete stringers having a cushion material embedded in the same and using the present form of rail resting on said cushion and having the base and lower part of web embedded in the concrete, and metal tie-rods provided at intervals to hold the rails in gage, as and for the purpose specified.

3. The combination in a railway road-bed and track construction of parallel steel-reinforced-concrete stringers connected by reinforced concrete extending between the rails and having a rail-shoe embedded in the stringers with the vertical part of the outside of same extending above the concrete so that rail bolts and tie-rod bolts can be inserted or removed, a cushion material embedded in the rail-shoe on which the detached curved base of the rail rests and upon which the web of rail rests, the web of rail extending down between the vertical parts of rail-shoe and having enlarged bolt holes in the same to provide for compression of cushion and for unequal expansion and contraction of rail and rail-shoe, said rail being bolted between the vertical parts of rail-shoe and having incased metal tie-rods at intervals in place of said bolts to hold the rails in gage, as and for the purpose shown and provided.

4. In combination in a railway road-bed and track construction of parallel steel-reinforced-concrete stringers with ordinary street paving having a concrete base, a rail-shoe of curved steel plates resting on said stringers and having a cushion within said rail-shoe upon which the detached curved steel rail base rests and upon which the web of rail rests, the rail bolted between the ver-

tical parts of rail-shoe with the bolt holes in web of rail enlarged to provide for compression of cushion and unequal expansion and contraction of rail and rail shoe, and having metal tie-rods at intervals in place of bolts to hold rails in gage, and having paving materials brought up flush with the top of rails except a narrow groove on inside of rails where flange of wheels runs, and provided with a row of brick on outside of rails to furnish a means of getting at bolts and cover to manhole to conduit without disturbing any other part of the paving, as and for the purpose shown and specified.

5. The combination in a railway road-bed and track construction of parallel reinforced-concrete stringers called primary concrete, connected by reinforced concrete extending between the rails or rail-shoes and on the outside of rails or rail-shoes, called secondary concrete; the primary and secondary coats of concrete bound together on outside of rails or rail-shoes by vertical, steel-reinforcing bars placed at intervals; and this secondary coat of concrete reinforced lineally by a steel reinforcing bar extending in center of track parallel with the rails, by the rails or rail-shoes and by a tube or conduit embedded in the same on the outside of rails, as and for the purpose shown and specified.

6. The combination in a railway road-bed and track construction of parallel rail shoes having a vertical part of opposing steel plates extending above a concrete road-bed and a rail, with the ends of the web tongued and grooved and matched together to hold the same flush at the ends, bolted between said vertical parts and extending down and resting on a curved base or cap that rests on a cushion inclosed within the steel plates, as and for the purpose specified.

Signed this the 19th day of October 1910.

JOHN N. D. BROWN.

Witnesses:

O. C. STEPHENSON,
H. E. SUTTER.