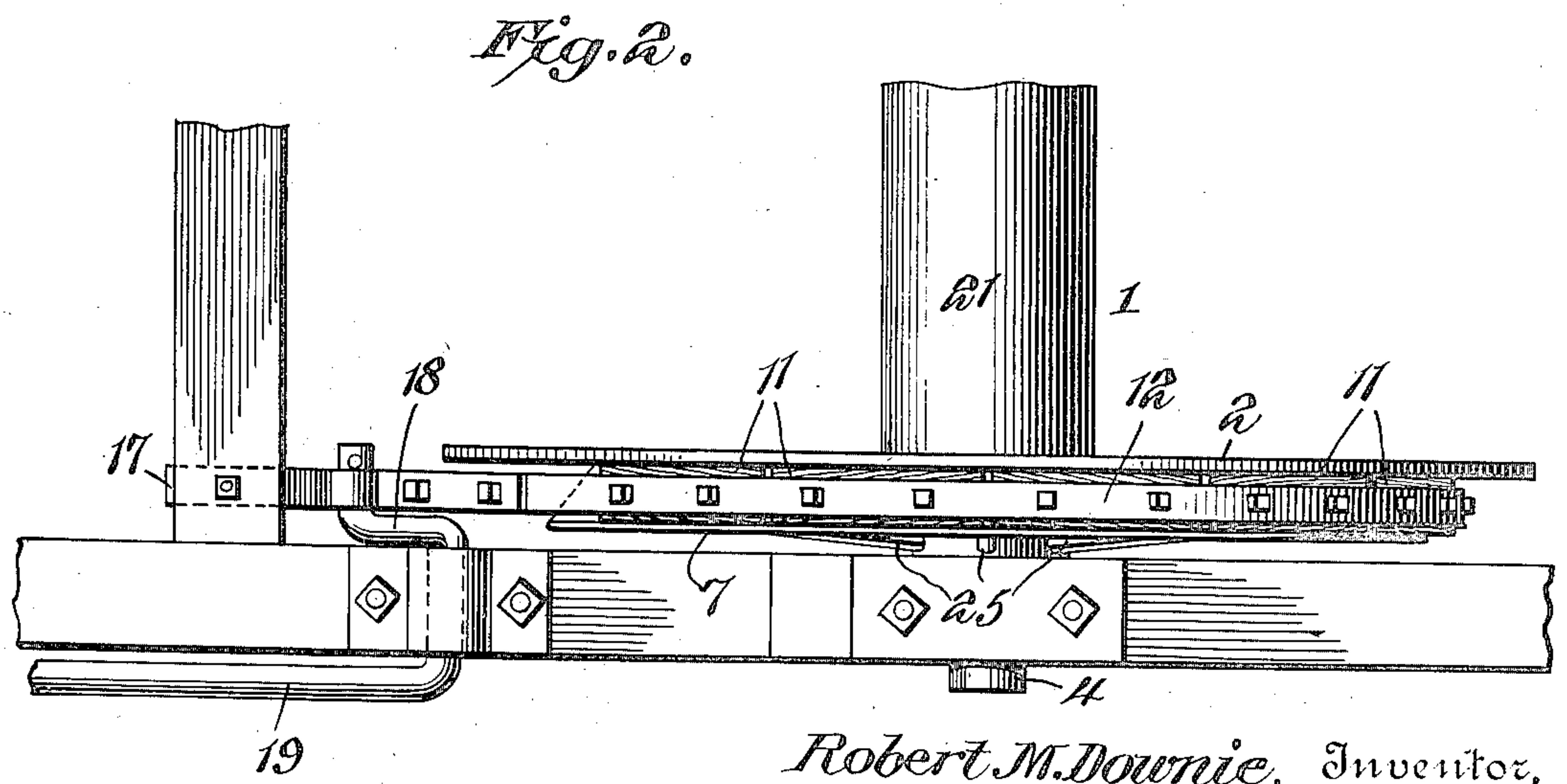
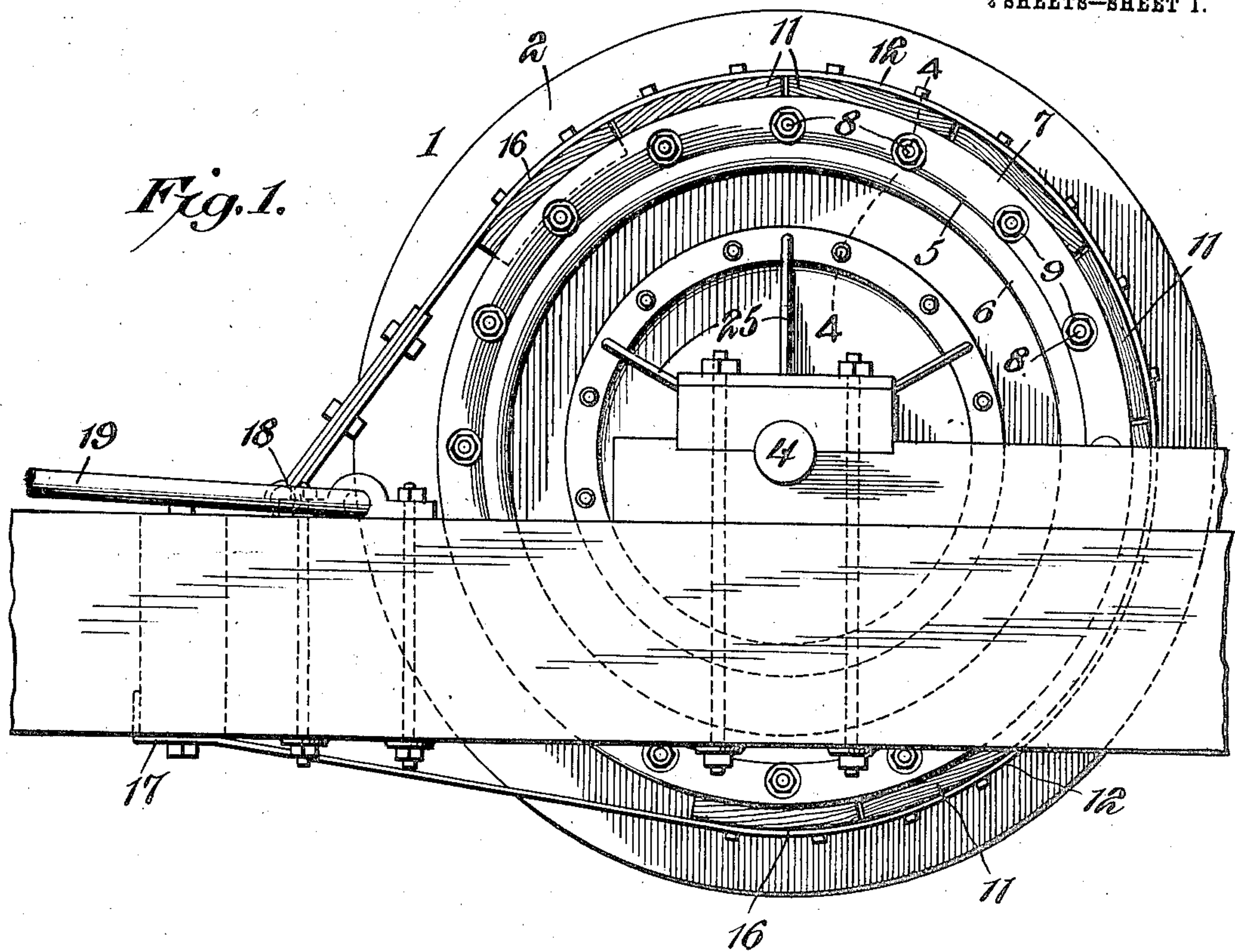


**R. M. DOWNIE.**  
**BRAKE MECHANISM.**  
 952,514.  
 APPLICATION FILED MAY 26, 1909.  
 Patented Mar. 22, 1910.  
 2 SHEETS—SHEET 1.



Witnesses  
*Howard D. Orr.*  
*H. F. Riley.*

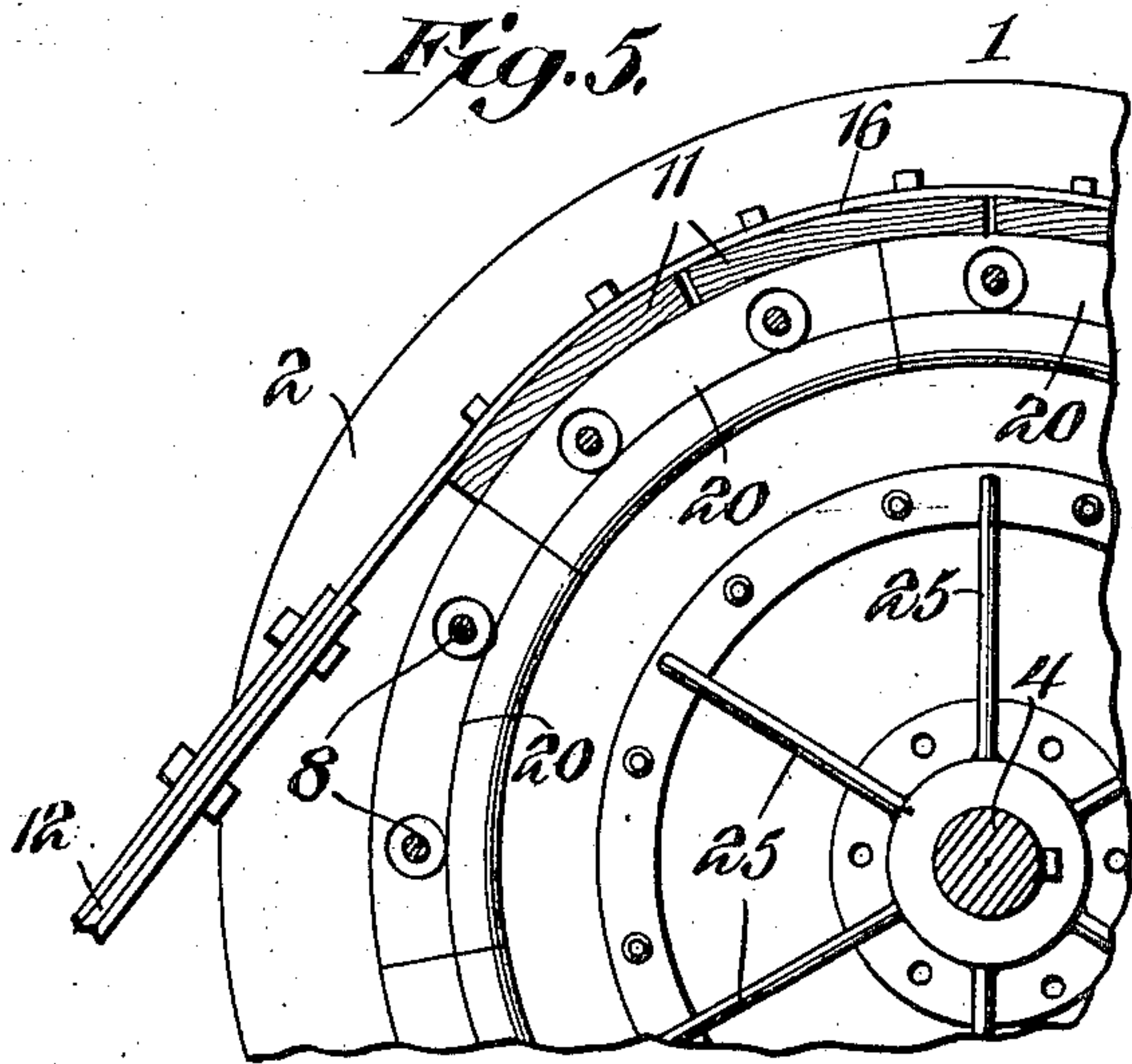
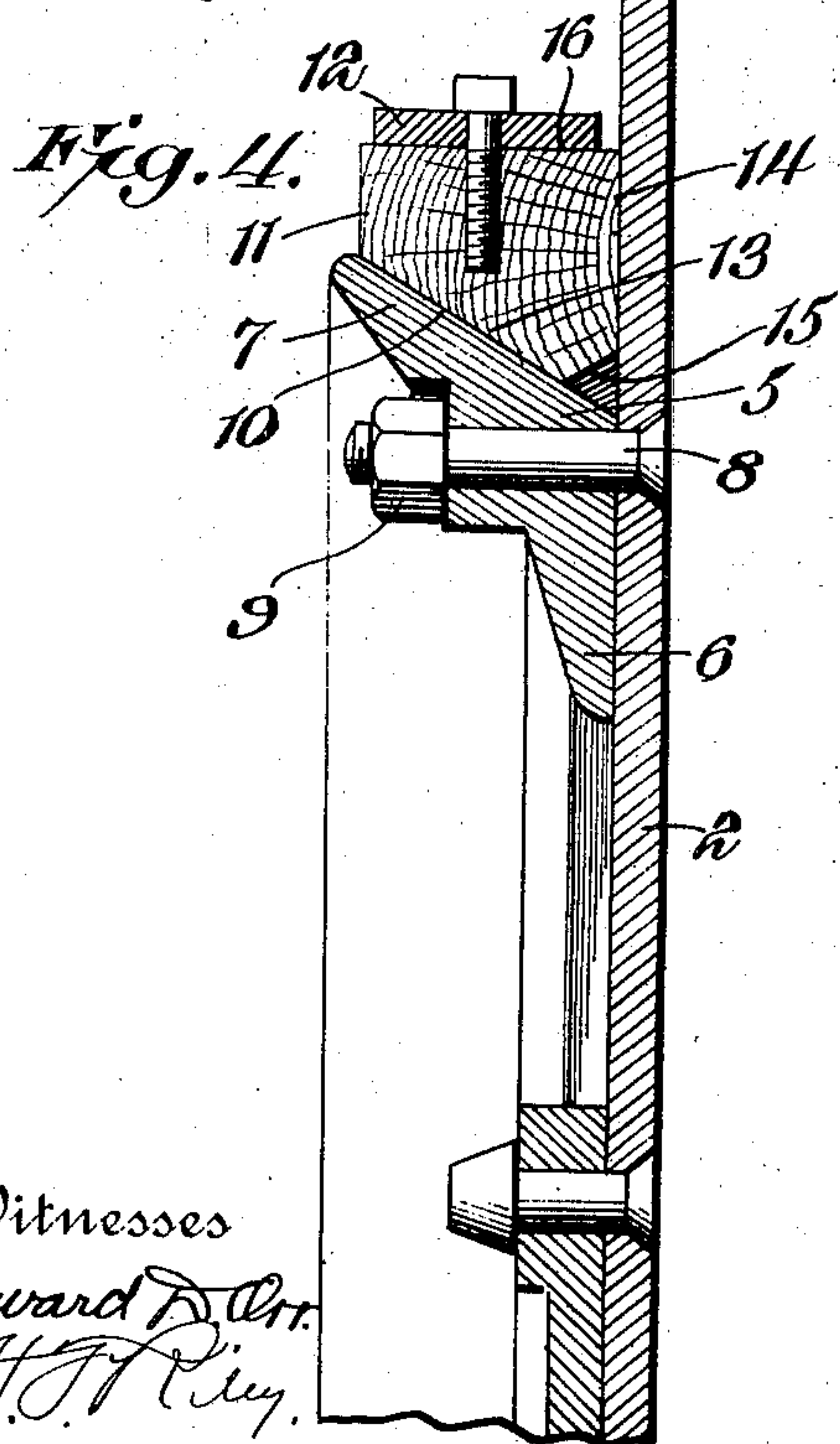
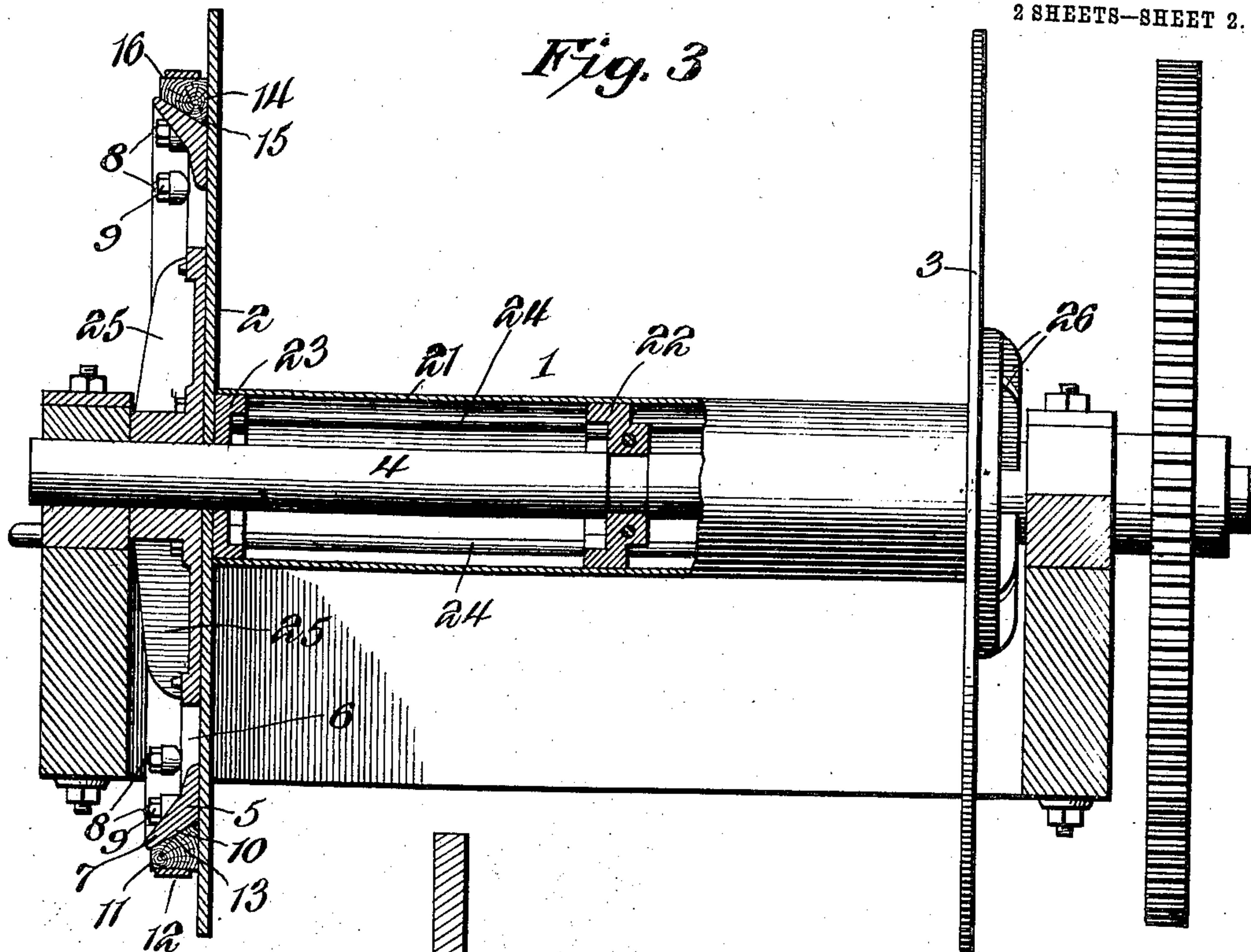
Robert M. Downie, Inventor,  
 By *E. G. Siggers.*  
 Attorney

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By

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Attorney



# UNITED STATES PATENT OFFICE.

ROBERT M. DOWNIE, OF BEAVER FALLS, PENNSYLVANIA, ASSIGNOR TO THE KEYSTONE DRILLER CO., OF BEAVER FALLS, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## BRAKE MECHANISM.

952,514.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed May 26, 1909. Serial No. 498,428.

*To all whom it may concern:*

Be it known that I, ROBERT M. DOWNIE, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented a new and useful Brake Mechanism, of which the following is a specification.

The invention relates to improvements in brake mechanism, more particularly to that illustrated and described in Patent No. 785,295, granted to me March 21, 1905.

The brake wheel of the mechanism of the said patent is used upon the reel or drum, on which the drilling cable is wound in large drilling machines. The drum or reel holds from 2500 to 3000 feet of cable by which the drilling tools are suspended, operated and withdrawn. These drilling tools frequently weigh up to one and one half tons in drilling a hole to the depth of 3000 feet. The brake wheel is employed for controlling the rotation of the reel or drum in lowering this heavy weight of the drilling tools into the well and for the sake of speed, operators are accustomed to permit these tools to run down rapidly, which results in a very severe friction in the groove of the brake wheel. As a result of this operation the brake wheel becomes heated, sometimes almost red hot, so that it is necessary to pour water on it in order to keep it cool while the tools are being lowered. Also the rim of the brake wheel is heated very rapidly while the hub and spokes owing to the action of the air remain comparatively cool. The unequal expansion of the rim and the spokes has a tendency to break the wheel and cause the rim to fly to pieces, greatly endangering the life of the operator.

The object of the present invention is to eliminate the spokes and web of the brake wheel, and to permit the rim thereof to expand freely and uniformly, whereby breakage of the brake element and the danger resulting therefrom will be entirely avoided.

Another object of the invention is to increase the strength and durability of the brake mechanism, and to render the same more effective in controlling the rotation of the cable reel or drum.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying

drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a side elevation of the brake mechanism, constructed in accordance with this invention. Fig. 2 is a plan view of the same. Fig. 3 is a transverse sectional view. Fig. 4 is an enlarged detail sectional view, taken substantially on the line 4—4 of Fig. 1. Fig. 5 is a side elevation of a portion of a brake mechanism, illustrating another form of invention in which a sectional rim is employed.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a cable reel or drum, equipped with vertical wrought iron heads 2 and 3, and mounted on a shaft 4, which is journaled in suitable bearings. The wrought iron head 2 carries the brake wheel element or rim 5, constructed of cast iron, or other suitable metal, and consisting of an inner flange 6 and an outer flange 7. The inner flange 6 has a flat inner vertical face, which is fitted against the outer face of the head 2 of the reel, and it is secured to the same by bolts 8, or other suitable fastening devices, which do not interfere with the uniform expansion and contraction of the rim member 5. The heads of the bolts 8 are preferably counter-sunk in the inner face of the head 2 of the reel, and the nuts 9 are seated in suitable recesses in the outer face of the rim.

The outwardly extending flange 7 of the rim is arranged at an inclination, and is provided with a smooth inclined peripheral engaging face 10, disposed at an acute angle to the outer portion of the head 2 of the reel, and coöperating with the same in engaging with shoe sections 11. The shoe sections, which are bolted or otherwise secured to a flexible metallic band 12, are preferably constructed of wood, and they have inclined inner or bottom engaging faces 13 to coöperate with the brake rim, and vertical inner side faces 14 to engage with the outer face of the head 2 of the reel. The lower inner corners are truncated to provide nar-



row lower faces 15, which are spaced from the angle or meeting portions of the brake rim and the head 2, as clearly illustrated in Fig. 4 of the drawings. This will permit the shoe sections to move inward as they become worn and prevent the lower inner corners of the shoe sections from interfering with the proper engagement of the bottom and side faces of the shoe sections with the rim and the head 2. The rim and the head 2 provide a relatively large area of braking surfaces, and the friction is correspondingly distributed, thereby enabling the proper control of the reel to be obtained with less pressure than where the brake mechanism has materially less frictional surfaces. The outer peripheral faces 16 of the shoe sections are curved, and are fitted against the inner face of the flexible metallic band.

The flexible metallic band surrounds the braking rim, and is attached at one end 17 to a suitable portion of the structure, in which the brake mechanism is employed, and its other end is connected with a crank element 18 of an operating lever 19, like that shown and described in the aforesaid patent, but any other suitable means may be employed for operating the brake mechanism. When pressure is applied to the shoe sections, the latter are caused to frictionally engage both the periphery of the rim and the outer face of the head 2, the inclination of the rim causing the shoe sections to move inward toward the head 2 as the said sections become worn, whereby a proper frictional engagement between the cooperating members is constantly maintained during the operation of the brake. The wrought iron head 2, which constitutes one member of the brake mechanism, is subjected to a portion of the frictional force of the brake blocks or shoe sections, but owing to its construction, it is not injured by the heat resulting from the application of the brake.

In the embodiment of the invention illustrated in Fig. 5 of the drawings, the brake wheel element or rim is composed of a plurality of sections 20, bolted or otherwise secured to the outer face of the head of the cable reel. The sections 20, which may be of any desired length, afford an increased freedom of expansion and contraction, besides enabling any portion of the rim to be renewed without removing or discarding an entire rim. The cable reel comprises in its construction the said wrought iron heads 2 and 3 and the cylindrical casing 21, interposed between the wrought iron heads 2 and 3 and supported by central and end supports 22 and 23. The central and end supports 22 and 23 are mounted on the shaft 4, and are pierced by an annular series of longitudinal rods 24, extending through the wrought iron heads and through exterior reinforcing plates or castings 25 and 26. The circular

supports 22 and 23 are provided with peripheral rims or flanges, forming seats for the casing and adapted to prevent the latter from collapsing. The ends of the rods are threaded for the reception of nuts, which are adapted to draw the parts tightly together, whereby a reel of great strength and rigidity is produced.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In brake mechanism, the combination with a reel head, of a brake wheel rim secured to and extending from the outer side of the reel head and having a friction face arranged at an acute angle to the said head, and co-acting means located at the recess formed by the rim and the reel head and arranged to co-act with and frictionally engage each of the said parts.

2. In brake mechanism, the combination with a reel head, of a brake rim secured to and extending from the reel head, a brake block or shoe engaging both the brake rim and the reel head, and means for applying braking pressure to the brake block or shoe.

3. In brake mechanism, the combination with a reel head having a vertical engaging portion, of a rim secured to and extending from the reel head and having an inclined face arranged at an angle to the vertical engaging portion of the reel head, a brake shoe or block having a vertical inner side face to cooperate with the reel head, an inner or lower inclined face to engage the said rim, and means for applying pressure to the brake block or shoe.

4. In brake mechanism, the combination with a reel head having a vertical engaging portion, of a rim extending from the reel head and having an inclined face arranged at an angle to the vertical engaging portion of the reel head, a brake shoe or block having a vertical inner side face to cooperate with the reel head, an inner or lower inclined face to engage the said rim, said brake block or shoe being truncated at the lower inner corner to provide an edge spaced from the angle formed by the rim and the reel head, and means for applying pressure to the brake block or shoe.

5. In brake mechanism, the combination with a reel head, of a brake rim mounted on the outer face of the reel head and consisting of an inner attaching flange fitted against the said head, and an outer inclined flange arranged at an acute angle to the outer portion of the reel head, a cooperating brake block or shoe having braking surfaces co-acting with the reel head and the inclined flange of the rim, and means for applying pressure to the brake block or shoe.

6. In brake mechanism, the combination with a reel head, of a brake rim consisting



of a series of sections secured to and extending from the outer side of the reel head, a brake block or shoe engaging both the brake rim and the adjacent outer face of the reel  
5 head, and means for applying braking pressure to the brake block or shoe.

7. In brake mechanism, the combination with a reel head, of a brake rim extending therefrom at an acute angle to the reel head,  
10 and a brake shoe or block having a vertical

face to bear against the reel head, and an inclined face to engage the said rim.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT M. DOWNIE.

Witnesses:

F. W. RANSOM,

WILL R. COOK.