

No. 755,767.

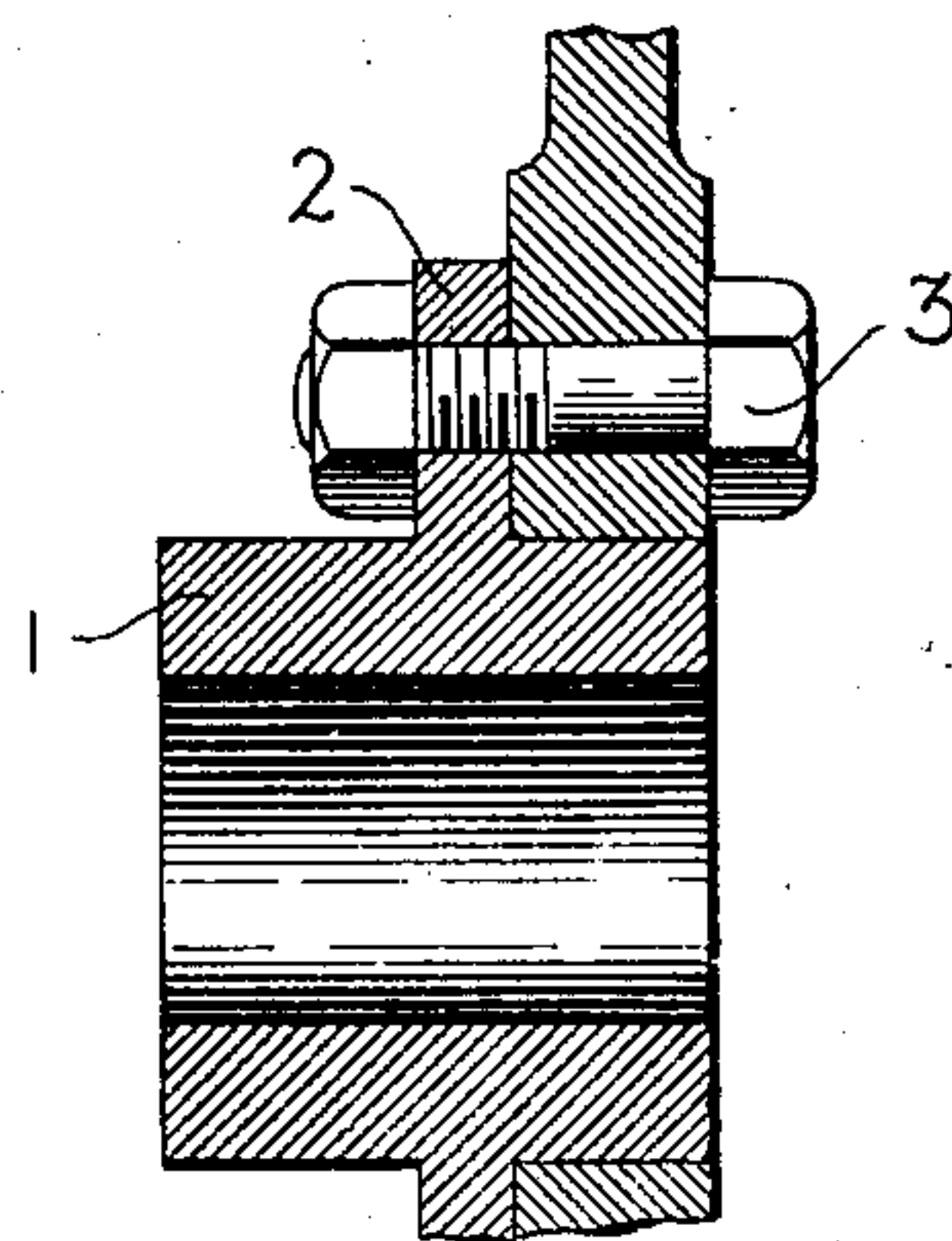
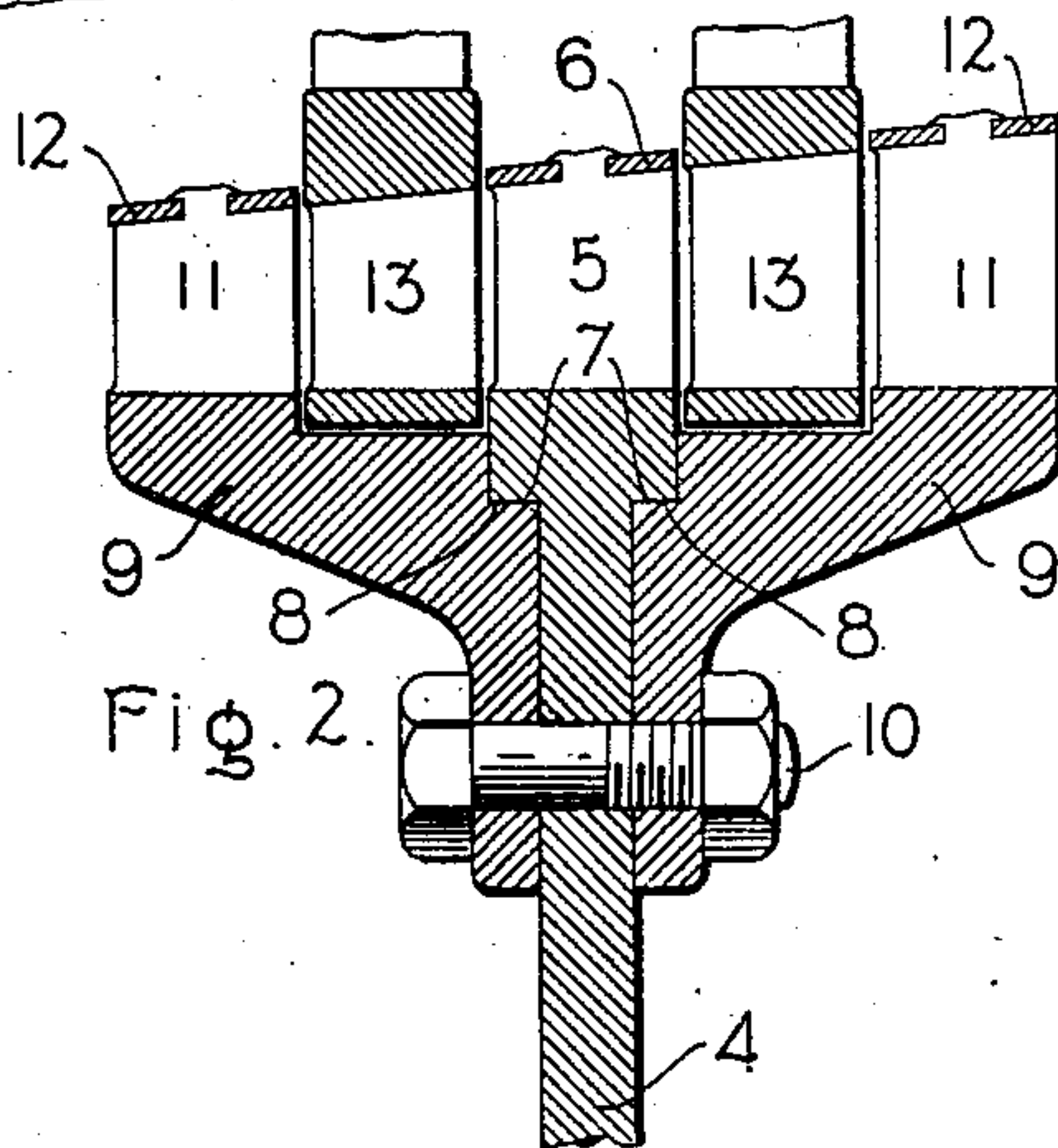
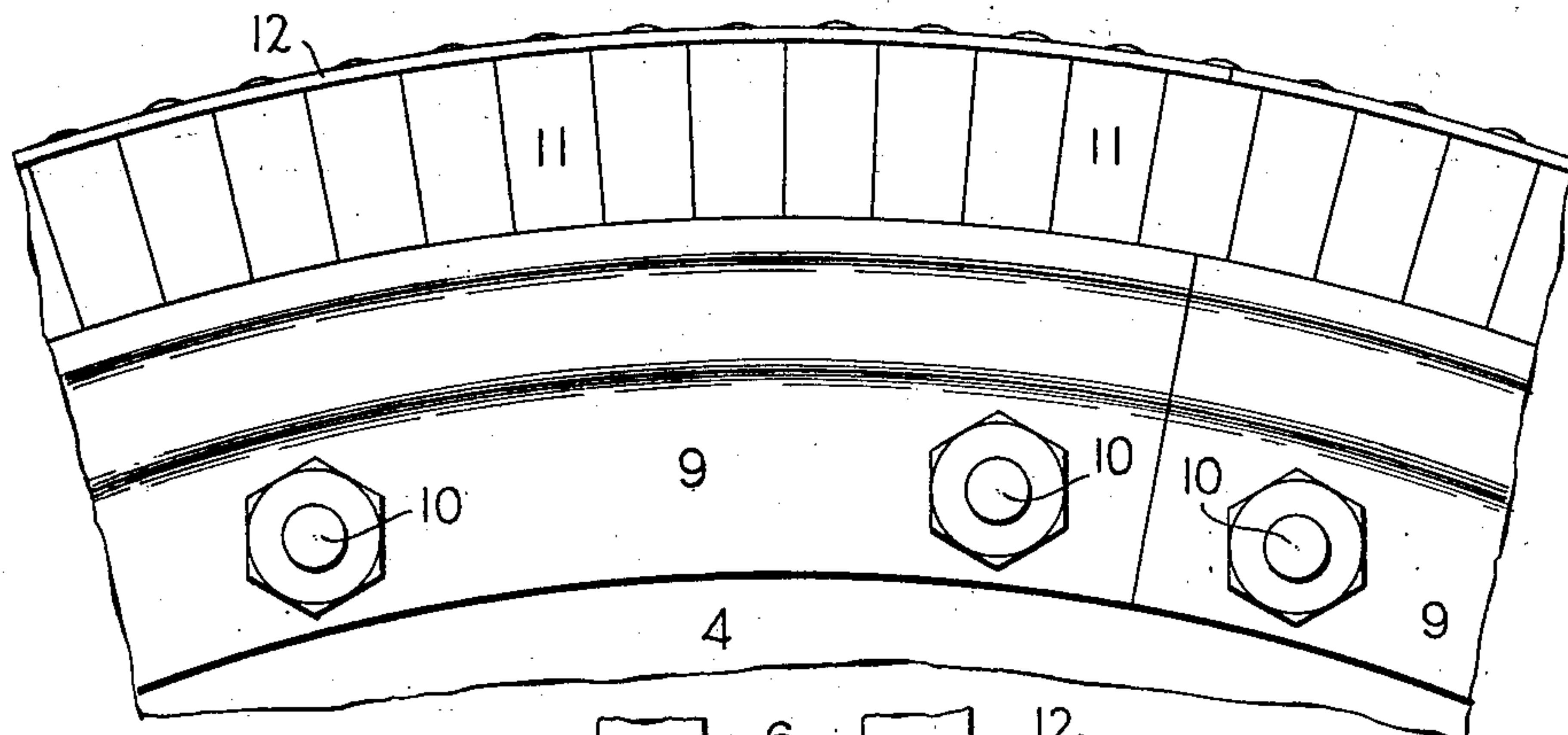
PATENTED MAR. 29, 1904.

B. H. HAMILTON & W. E. VER PLANCK.  
BUCKET WHEEL FOR STEAM TURBINES.

APPLICATION FILED SEPT. 28, 1903.

NO MODEL.

Fig. 1.



Witnesses

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Att'y.

# UNITED STATES PATENT OFFICE.

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A CORPORATION OF NEW YORK.

## BUCKET-WHEEL FOR STEAM-TURBINES.

SPECIFICATION forming part of Letters Patent No. 755,767, dated March 29, 1904.

Application filed September 28, 1903. Serial No. 174,905. (No model.)

*To all whom it may concern:*

Be it known that we, BRACE H. HAMILTON and WILLIAM EVERETT VER PLANCK, citizens of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Bucket-Wheel Constructions for Steam-Turbines, of which the following is a specification.

This invention relates to steam-turbines; and its object is to provide a bucket-wheel of light strong construction which takes up less room along the shaft and admits of cutting the buckets in the wheel and attaching to said wheel additional buckets. To this end we make a wheel having a hub of forged metal provided with a flange to which is secured a web of rolled metal, such as boiler-plate, preferably, having a series of buckets cut in its periphery. Inside the line of the buckets the web is provided on each side with a shoulder against which abuts a forged or cast metal ring, each ring having buckets cut or formed in its edge in line with those integral with the web.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a wheel embodying our invention; and Fig. 2 is a radial section of the upper half of such a wheel, showing also in section two intermediates or stationary buckets.

The hub 1 is forged with a flange 2, to which is secured, preferably by bolts 3, an annular web 4, of rolled metal, preferably boiler-plate. In the periphery of said web may be cut the buckets 5, whose tips are riveted into the tire or cover 6. On each side of the wheel inside the line of the buckets there is formed by cutting or forging a shoulder 7, against which abuts a shoulder 8 on a ring 9, which fits against the web and is secured by bolts 10 or otherwise. The ring may be forged or cast, and in its periphery are cut buckets 11, whose tips are riveted into a tire or cover 12. To facilitate manufacture, the bucket-rings are made in segments, as shown in Fig. 1, as are also the covers or tires. The buckets 11 are

spaced away from the buckets 5 in order to admit between them the intermediate buckets 13, which may be rotating or stationary, as is desired.

This construction is light, strong, and compact. The boiler-plate web has great tensional strength, and the engaging shoulders on the web and rings resist the centrifugal strain and prevent the bolts 10 from shearing off.

In accordance with the patent statutes we have described the principle of operation of our invention, together with the apparatus which we now consider to represent the best embodiment thereof; but we desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means.

What we claim as new; and desire to secure by Letters Patent of the United States, is—

1. In a steam-turbine, a bucket-wheel having a web provided with integral peripheral buckets, and one or more rings secured to said web and containing buckets.

2. In a steam-turbine, a bucket-wheel having a web provided with integral buckets, and a bucket-ring secured thereto, said web and ring having abutting shoulders.

3. In a steam-turbine, a bucket-wheel having a web provided with integral buckets and having a shoulder on each side, and bucket-rings secured to said web and provided with shoulders abutting the shoulders of the web.

4. The combination with a hub having a flange, of an annular web of boiler-plate secured thereto and having buckets cut in its periphery, and segmental forged rings secured on each side of said web and having buckets cut in their edges.

5. In a turbine, the combination of a wheel-web having integral peripheral buckets, shoulders on said web, buckets secured to the sides of the web and engaging with the shoulders, and intermediate buckets located between the buckets formed integral with the web and those which are secured to the sides of the web.

6. In a turbine, the combination of a wheel-web having integral peripheral buckets, shoul-



ders formed on opposite sides of the web, intermediate buckets situated on each side of the peripheral buckets and in proximity thereto, and rings attached to the web and engaging  
5 the shoulders, which rings are provided with integral buckets that deliver motive fluid to and receive it from the intermediate buckets.

In witness whereof we have hereunto set our hands this 25th day of September, 1903.

BRACE H. HAMILTON.

WILLIAM EVERETT VER PLANCK.

Witnesses:

DUGALD McK. McKILLOP,  
CHATTIN BRADWAY.