

C. A. PARSONS.
STRIPS FOR TURBINE BLADES.
APPLICATION FILED AUG. 12, 1907.

994,029.

Patented May 30, 1911.

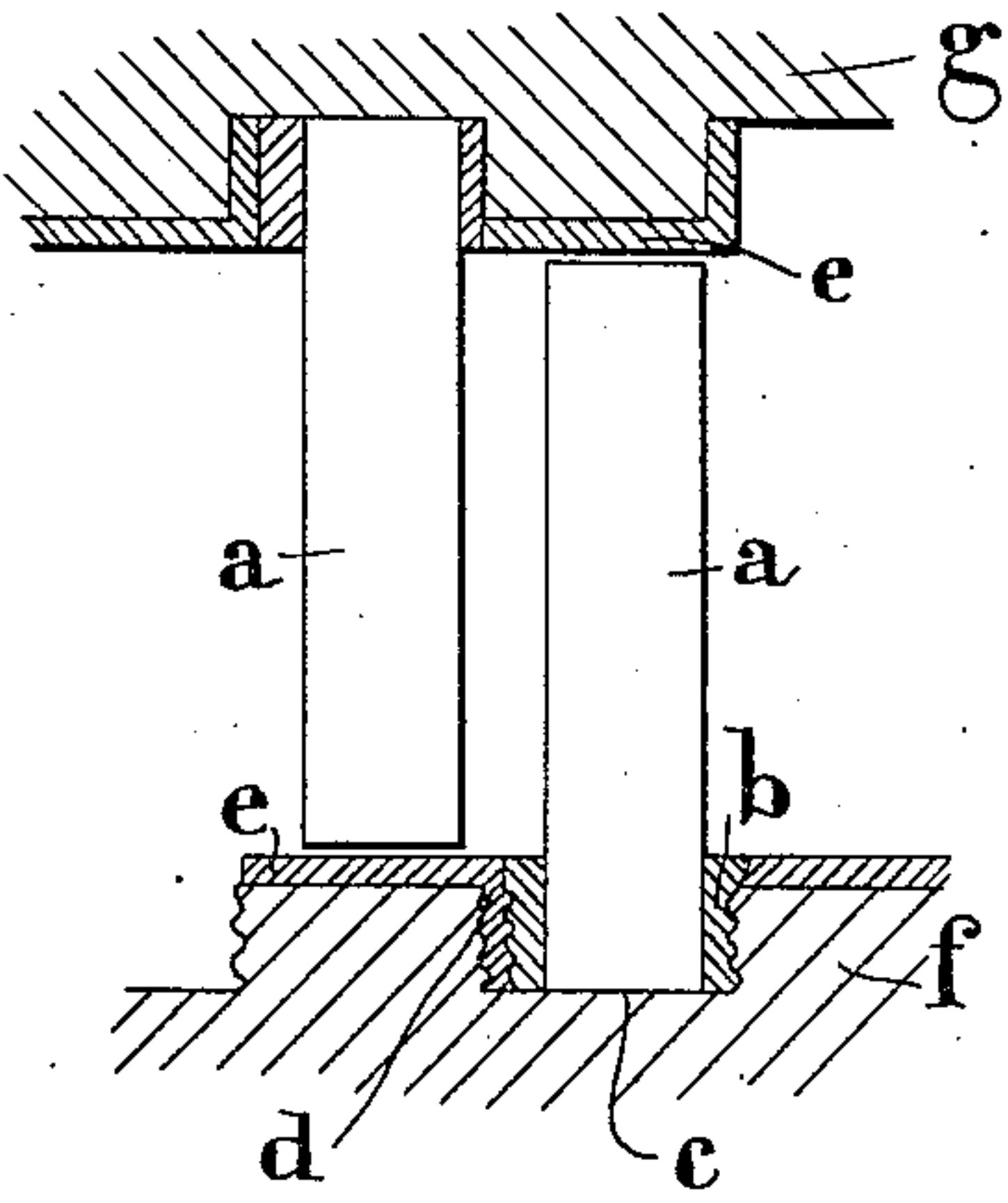


Fig. 1.

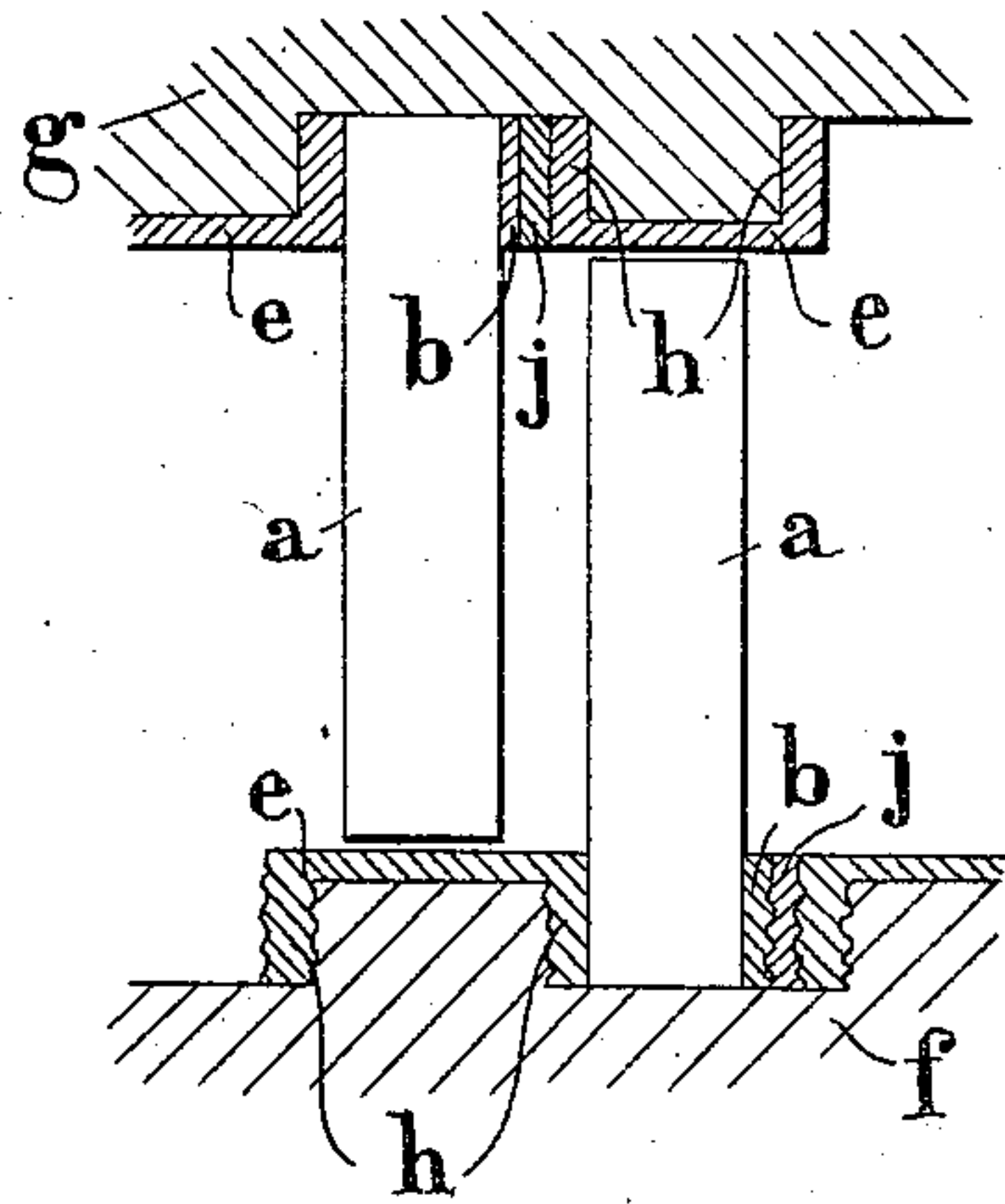


Fig. 2.

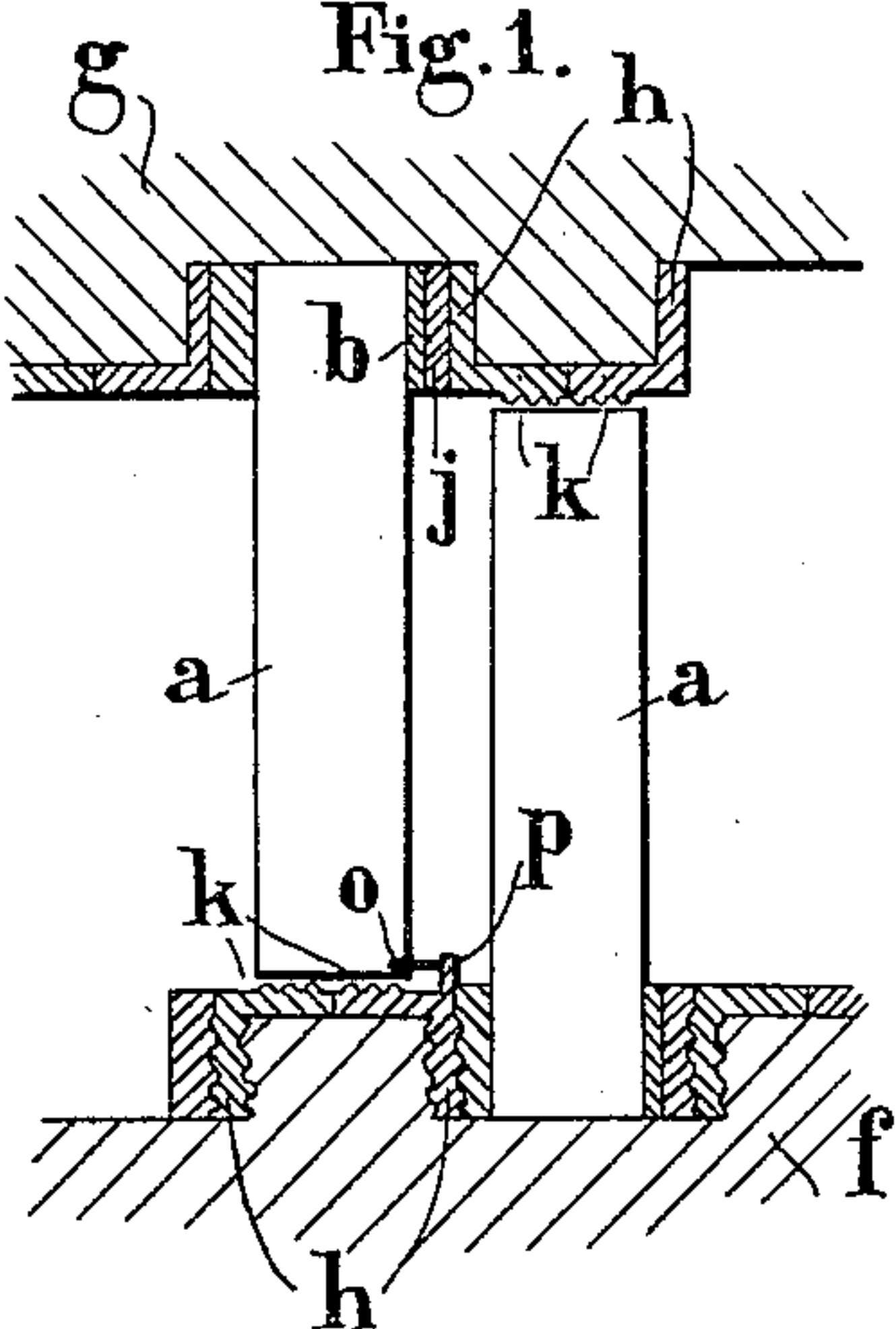


Fig. 3.

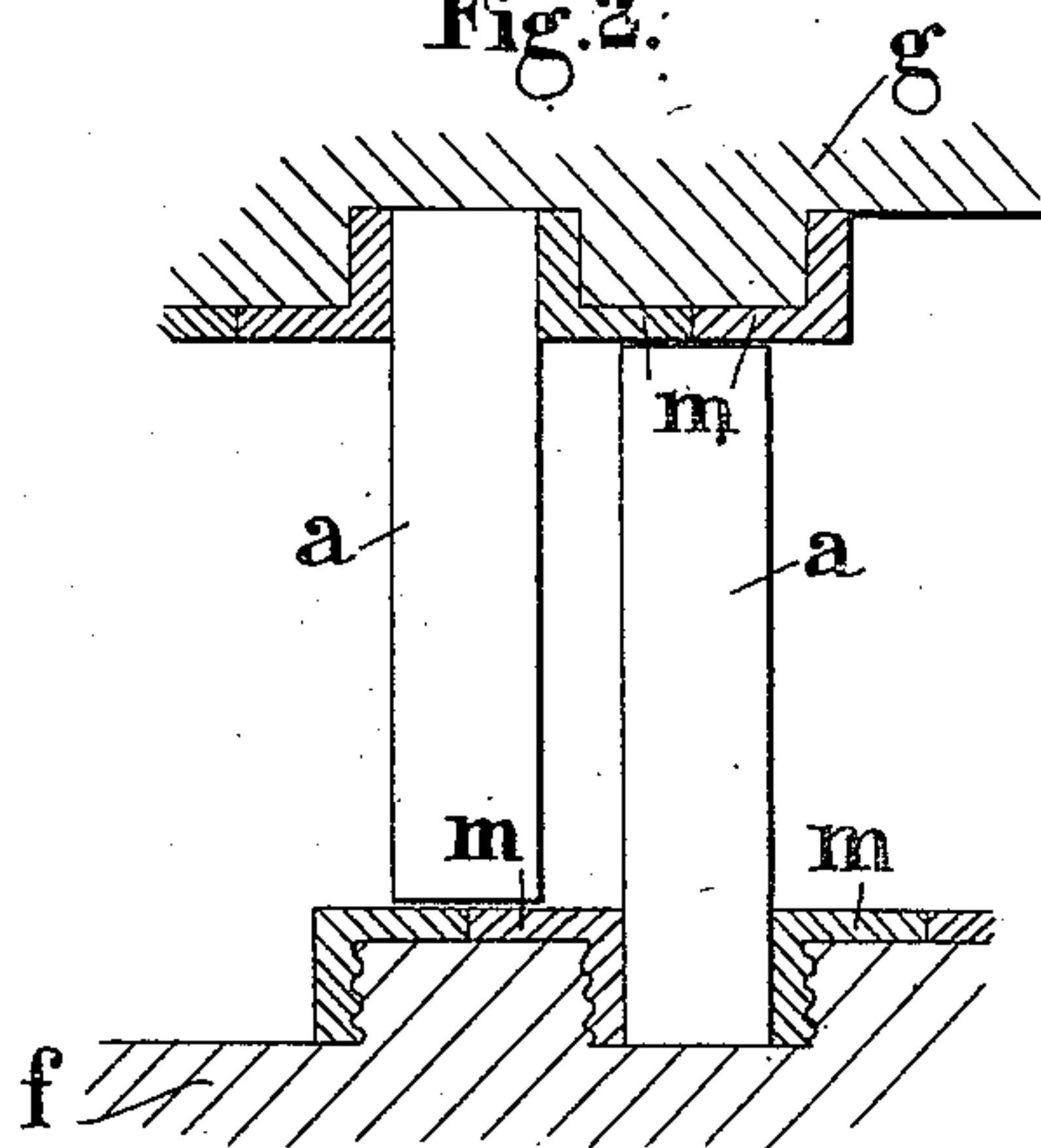


Fig. 4.

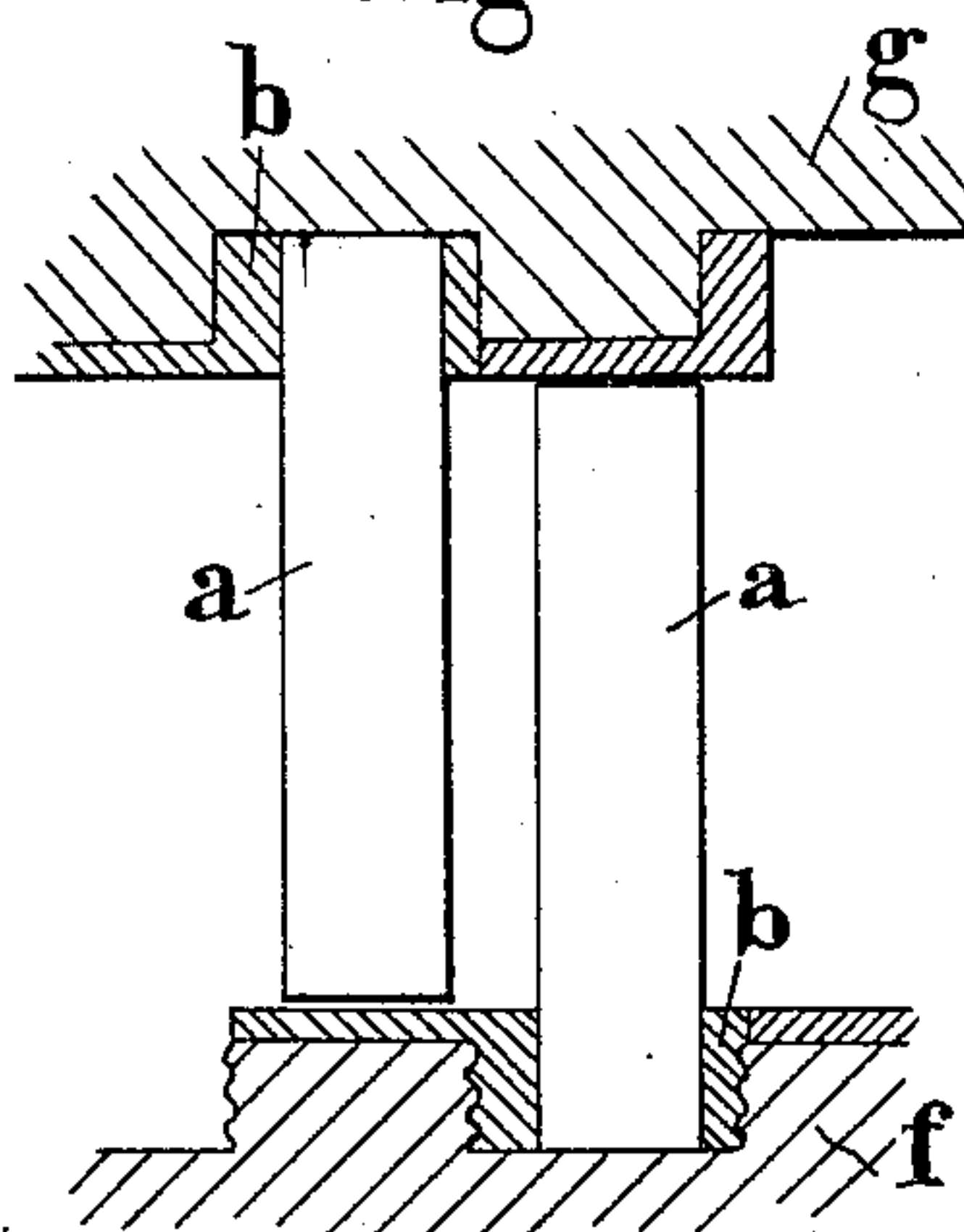


Fig. 5.

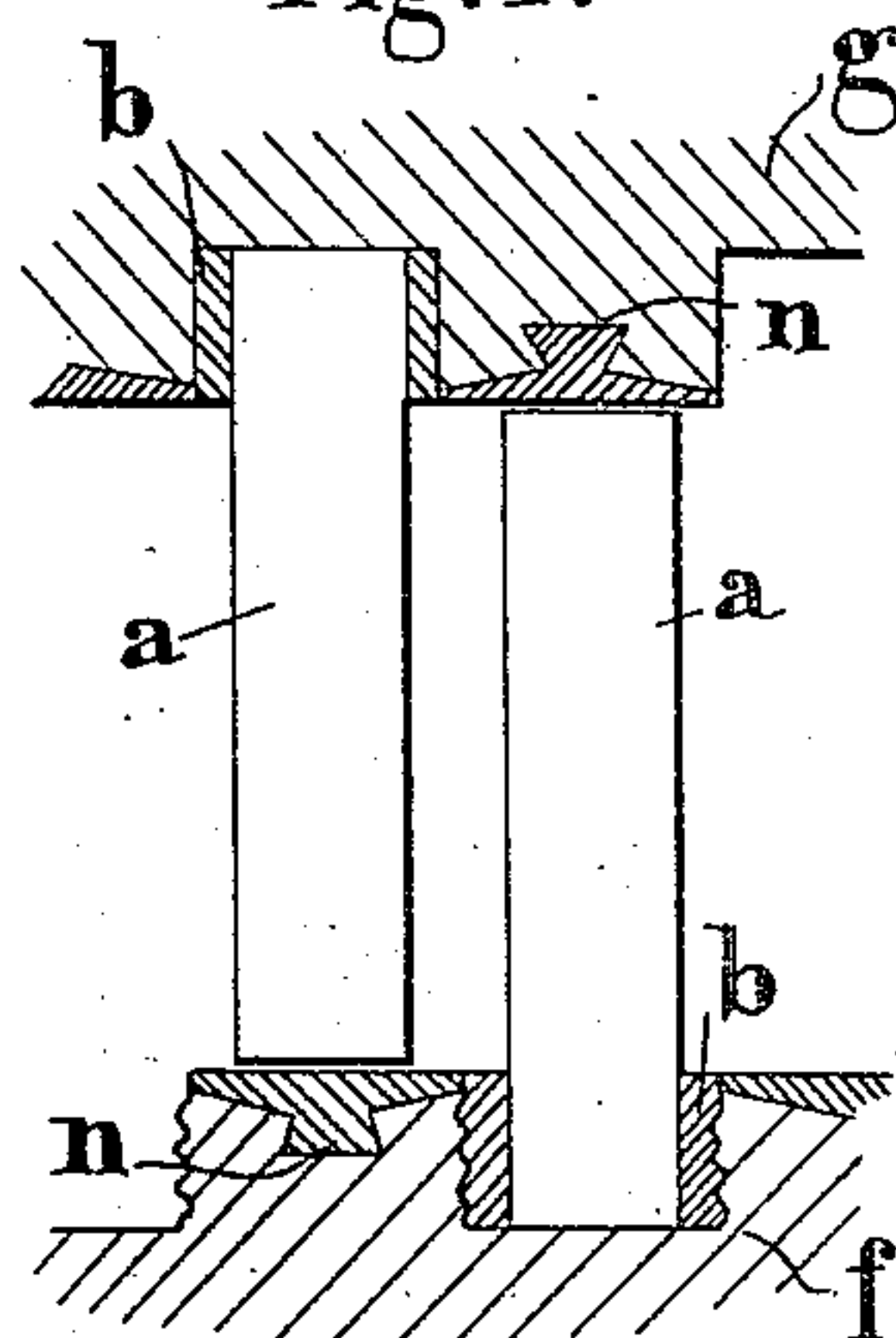


Fig. 6.

Attest
H. M. Barrett.
R. E. Curand

Inventor
Charles A. Parsons
By Spear, Middleton, Donovan & Spear
ATTYS

UNITED STATES PATENT OFFICE.

CHARLES ALGERNON PARSONS, OF NEWCASTLE-UPON-TYNE, ENGLAND.

STRIPS FOR TURBINE-BLADES.

994,029.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed August 12, 1907. Serial No. 388,235.

To all whom it may concern:

Be it known that I, CHARLES ALGERNON PARSONS, a subject of the King of Great Britain and Ireland, residing at Heaton Works, Newcastle-upon-Tyne, in the county of Northumberland, England, have invented certain new and useful Improvements in and Relating to Strips for Turbine and Like Blades, Packings, and the Like, of which the following is a specification.

This invention relates to the strips used in turbines, compressors and the like for holding the blades or for effecting steam packing.

The object of the present invention is to avoid corrosion of the rotating drum and casing.

This invention may be applied with any form of blading, but particularly with that form in which a blade holding strip is employed. In such blade fixing it has been proposed to make the blade carrying strip of considerably greater width than the blades they support, thereby providing a tread. An objection to widening the blade strip in this way is that the metal between the strips becomes too thin in comparison with the depth of the groove.

The invention consists in providing in conjunction with blade or other strips, means for covering those parts of the rotating drum and casing which would otherwise be exposed to corroding action and in which said blades are supported.

Referring now to the accompanying drawings which form part of this specification and serve to illustrate convenient forms of carrying this invention into practical effect, Figure 1 is a section showing a form in which both the cylinder and drum of the turbine are protected by an angle piece extending the whole way between the adjacent rows of blades on the turbine drum and casing. Figs. 2 to 6 are similar sections showing modified forms of the protecting or covering strips.

In carrying this invention into effect, any form of blade fixing may be used either blade fixings in which separate distance pieces between the blades and calked in the grooves or those fixings in which the blades are carried by a strip and this strip or string of blades is secured in the drum or casing by calking directly or on an additional strip

or by other well known means. Forms of blade fixings such as indicated are well known and need no further description here.

In Fig. 1, the blades, *a*, are carried by a strip, *b*, which rests in a groove, *c*, provided with corrugations. Into the groove there also passes an angle strip, *d*, having corrugations or dovetails corresponding to the corrugations or dovetails in the groove. The strip, *b*, and the angle strip, *d*, may now be calked so as to hold the blades or bladed strip firmly in place. The side, *e*, of the angle piece, *d*, is comparatively thin and forms a covering for the drum, *f*, or casing, *g*. It will be seen the corrugations may be omitted, as shown in Fig. 1, as applied to the fixed blades in the drum, *g*.

In the form of the invention shown in Fig. 2, the covering piece, *e*, is in the form of a channel having the parts, *h*, *h*, resting in the grooves. In Fig. 2 there is also shown an additional calking piece, *j*.

Fig. 3 shows a form in which instead of a channel a double angle is used, the two parts, *k*, *k*, of the angle meeting, or practically meeting, midway or at other positions between the grooves so as to provide a covering for the drum and casing.

Instead of employing a separate piece for carrying the protecting strip, I may form the root strip with a fin or web such as *m*, *m*, extending on either side of the grooves as shown in Fig. 4 or on one side only as shown in Fig. 5; or again, the protecting strip may be inserted in a separate groove, *n*, independently of the blade grooves as shown in Fig. 6.

Many other modifications might be made to this invention and it will be understood that the protecting strip is fixed in the way best suited to the form of blading adopted.

It is customary sometimes to provide a side packing for the blades at the tip or at the root and this packing, a ring or brush carried by the blades, bears against the root strip of the adjacent row of blades. This bearing surface may, as will be readily understood, be formed on the protecting strip somewhat in the fashion indicated in Fig. 3 where, *o*, represents the ring carried by the blade, this ring being adapted to bear on a projection, *p*, carried by the protecting strip.

The surface of the protecting strip may be finely serrated as described in British Patent No. 22127 of 1905.

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

1. In combination in a turbine having
5 fixed and rotating bladed parts, strips preventing corrosion of the exposed surface of said parts, and corrugated means holding said strips in position on one of the turbine parts.
- 10 2. In combination in a turbine having fixed and rotating bladed parts, strips preventing corrosion of the exposed surface of said parts and corrugated means holding said strips in position on the rotating turbine part.
- 15 3. In combination in a turbine having fixed and rotating blades carried by fixed and rotating parts, strips preventing corrosion of the exposed surface of said parts and corrugated means holding said strips in position on one of said parts.
- 20 4. A turbine comprising in combination fixed and rotating parts, blades carried in grooves in said parts, strips covering the exposed surface of said parts, a part of each strip extending within said grooves, corrugations on the extended part of the strips belonging to one of the turbine parts, said corrugations engaging with corresponding corrugations in the grooves in that turbine part.
- 25 5. A turbine comprising in combination fixed and rotating parts, blades carried in grooves in said parts, strips covering the exposed surface of said parts, a part of said

strips extending within said grooves and corrugations on the extended part of the strips attached to the rotating turbine part, said corrugations engaging with corresponding corrugations in the grooves on the rotating part. 40

6. In combination in grooves on turbine drums and casings, blades and blade holding means, corrugated L shaped pieces extending on either side of the groove half-way toward the adjacent grooves. 45

7. In combination in grooves on turbine drums and casings, blades and blade holding means, L shaped pieces in said grooves, and extending along the surface of the drum or casing toward the adjacent grooves for the purpose of covering the exposed part of the drum or casing, said covering pieces having corrugations on their external faces. 50

8. In combination in grooves on turbine drums and casings, blades and blade holding means, L shaped pieces in said grooves and extending along the surface of the drum or casing toward the adjacent grooves for the purpose of covering the exposed surface of the drum or casing, said covering pieces on the drum having corrugations on their external faces, side packing means for said blades carried by said covering strips. 60

In testimony whereof, I affix my signature in presence of two witnesses. 65

CHARLES ALGERNON PARSONS.

Witnesses:

HENRY GRAHAM DAKYNS, Jr.,

FREDERICK GORDON HAY BEDFORD.