(No Model.)

E. & G. ASHWORTH.

CARDING ENGINE CYLINDER.

No. 421,153. Patented Feb. 11, 1890.

FIG 2

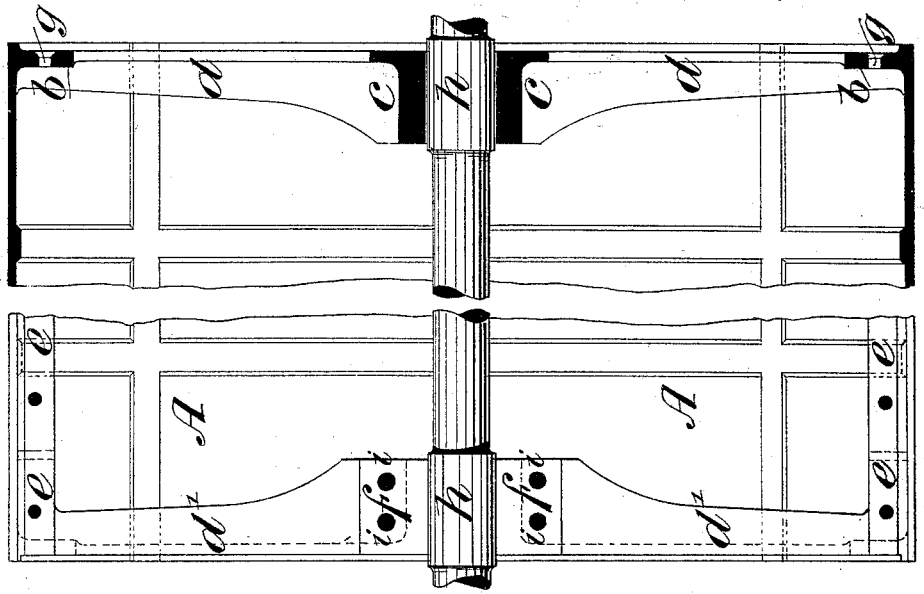


FIG 3

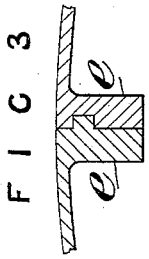
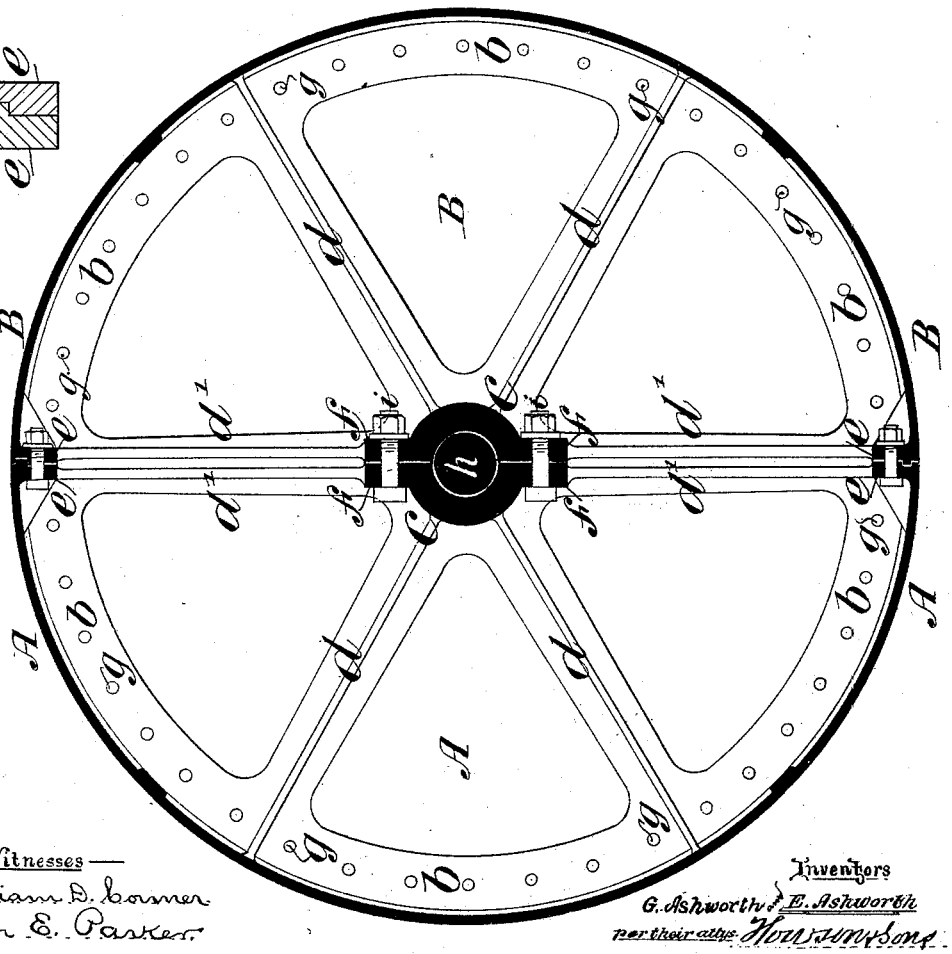


FIG 1



Witnesses
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UNITED STATES PATENT OFFICE.

ELIJAH ASHWORTH AND GEORGE ASHWORTH, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

CARDING-ENGINE CYLINDER.

SPECIFICATION forming part of Letters Patent No. 421,153, dated February 11, 1890.

Application filed November 9, 1886. Serial No. 218,388. (No model.) Patented in England December 17, 1885, No. 15,490.

To all whom it may concern:

Be it known that we, ELIJAH ASHWORTH and GEORGE ASHWORTH, engineers, subjects of the Queen of Great Britain and Ireland, and residing at Manchester, county of Lancaster, England, have invented certain Improvements in the Production of Carding-Engine Cylinders, (for which we obtained a patent in Great Britain, No. 15,490, dated December 17, 1885,) of which the following is a specification.

Our invention relates to the metal cylinders of carding-engines, and has for its object to produce a cylinder which will be more easily and economically made than the ordinary carding-engine cylinder, and which can be placed on the central shaft and secured thereto without the aid of wedges or keys in such a manner that the shaft is not distorted and the shaft and cylinder remain perfectly in truth with relation to each other, while the shaft can be easily removed and replaced without disturbing the truth of the cylinder. In the manufacture of these cylinders as ordinarily carried out the cylinder is composed of three principal parts—namely, a hollow cast-iron drum and two end castings formed with arms and central bosses, which are bored to suit the central shaft. The said hollow drum is usually made as a loam casting, the careful preparation of the mold adding greatly to the cost of the finished cylinder. The drum is bored at each end to fit upon the turned end castings; but even when the greatest care is exercised in all of the operations a near approximation to absolute truth is not always obtained, and in most cases it is necessary to add balance-weights to the cylinder.

According to our invention, we cast the cylinder in, say, two halves or sections, each half or section having arms which radiate from corresponding half-central bosses, which are bored when put together, so as to fit the central shaft. Each cylinder half or section is cast from a carefully-made pattern, and the outer drum-sections and the halves of the central boss are made with flanges, so that when two castings are put together and secured at these flanges by means of bolts a complete cylinder is formed. The meeting faces of the drum halves or sections are formed with tongues and grooves and are planed or "milled," so as to make a good joint. The meeting faces of the central half-bosses are planed or finished a very little below the level of the joint of the drum-sections. The two halves are then bolted together, a piece of thin paper, thin sheet metal, or other suitably-thin material being placed between the joint at the central bosses, so as to fill or make up the joint to the level of the flanges on the peripheries of the drum halves. We then bore the central bosses, remove the thin material, and insert the shaft, after which the bolts uniting the central half-bosses are tightened up. In the absence of the thin separating paper or material the half-bosses are allowed to come a little closer together, and are thus caused to grip the central shaft, whereby the cylinder is secured to the shaft without the use of keys, wedges, or screws. The cylinder is then turned on the outside and completed in the ordinary manner.

In the accompanying drawings, Figure 1 represents a cross-sectional view of a cylinder made in accordance with our invention. Fig. 2 is partly a face view of the half-cylinder A and partly a longitudinal sectional view of the cylinder, the length of the cylinder being curtailed in the latter figure for want of space.

The cylinder consists of two half-cylinders A and B. Each half-cylinder is provided with a half end consisting of a semi-annular flange *b*, connected with a half-boss *c* by means of arms *d d'*. The meeting edges of the two half-cylinders are provided with flanges *e e*, and the half-bosses are provided with flanges *f f*. All these parts in the case of each half-cylinder are cast together in one piece.

Upon and in the flanges *e* are formed tongues and grooves, as represented on a larger scale in Fig. 3. We prefer to form a tongue upon one flange and a groove in the other in the case of each half-cylinder, as in the case of the example illustrated. An advantage attending this formation is that when the meeting flanges are trued by means of "mills" or revolving cutters the same cutters with the same adjustment will prepare

the meeting faces of the flanges on both half-cylinders.

The two half-cylinders, when bolted together in the manner as clearly represented or in a suitable manner, form a complete cylinder.

In planing or "milling" the flanges *e* and *f* the meeting faces of the flanges *f* are reduced to a slightly lower level than the meeting faces of the flanges *e*, and in bolting the half-cylinders together we introduce a piece of thin material—such as paper—between the flanges *f*, so as to make the joint up to the level of the joint at the flanges *e*. The bosses *c* are then bored and the paper packing is afterward removed from between the flanges *f*, so that when the shaft *h* is placed in position the flanges *f* can be drawn slightly closer together by the bolts *i*, thereby causing the half-bosses to grip the shaft *h* firmly without the necessity for the employment of keys, and when the cylinder has been turned with the shaft in position and properly centered in the lathe the periphery of the cylinder will be truly concentric with the shaft *h*, and if the pattern from which the half-cylinders are cast has been prepared with care and the molding and casting operations been carefully executed the cylinder will have a close approximation to truth, and if in isolated cases it should be found necessary to use balancing-weights they will not require to be employed to the extent which is usual in the cases of cylinders produced in the ordinary manner. By means of this construction we can remove the shaft and replace it without interfering with the concentric truth of the cylinder.

The holes *g g* in the flanges *e e* are provided for the convenient attachment of the balance-weights, if such should be found necessary.

What we claim as our invention is—

1. A carding-engine cylinder composed of two halves, each cast in one piece and comprising a semi-cylinder provided at opposite ends with semi-annular flanges, radiating arms, and central half-bosses, and also provided at its edges with flanges, all substantially as described.

2. A carding-engine cylinder composed of two halves, each cast in one piece and comprising a semi-cylinder provided at opposite ends with radiating arms and central half-bosses, and also provided at its edges with flanges, the meeting faces of the flanges in the two halves being tongued and grooved, all substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ELIJAH ASHWORTH.
GEO. ASHWORTH.

Witnesses:
EDWARD K. DUTTON,
ARTHUR LEDSER.