(No Model.) 2 Sheets—Sheet 1.

G. WILKES & F. EDWARDS.

ANTI-FRICTION THRUST BEARING.

No. 482,430. Patented Sept. 13, 1892.

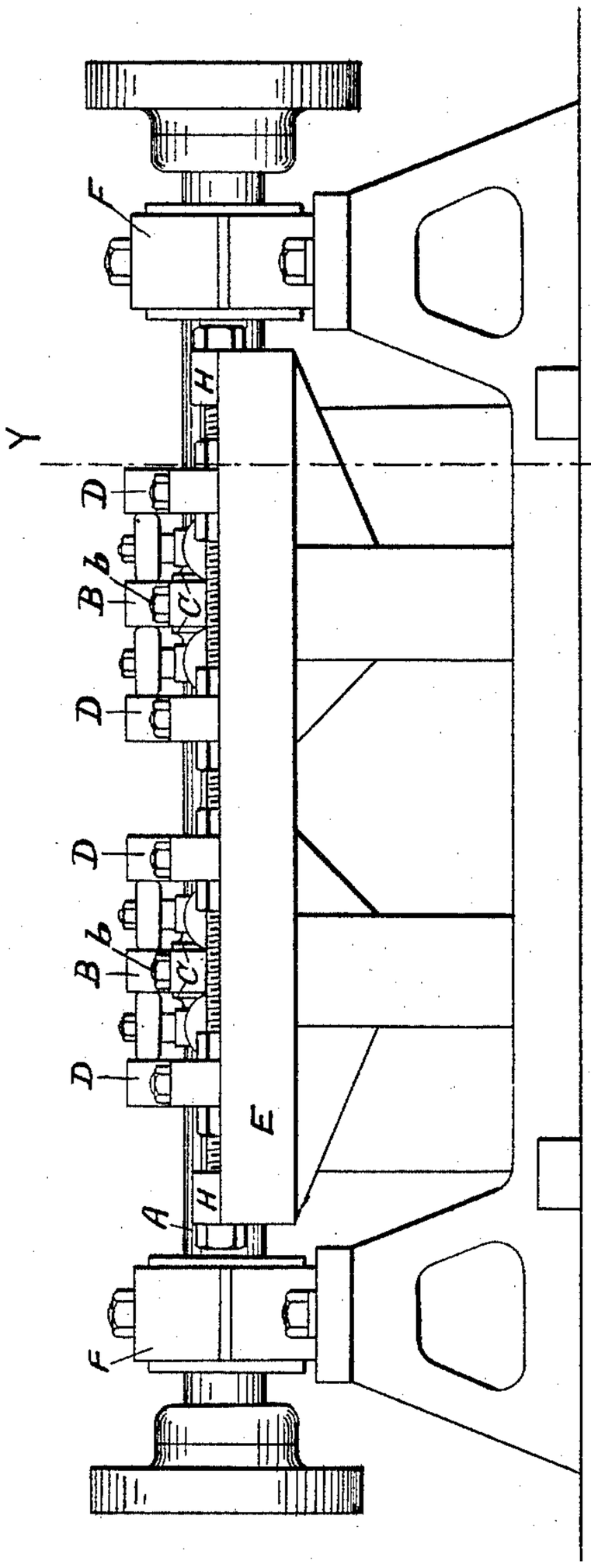

FIG. 1.

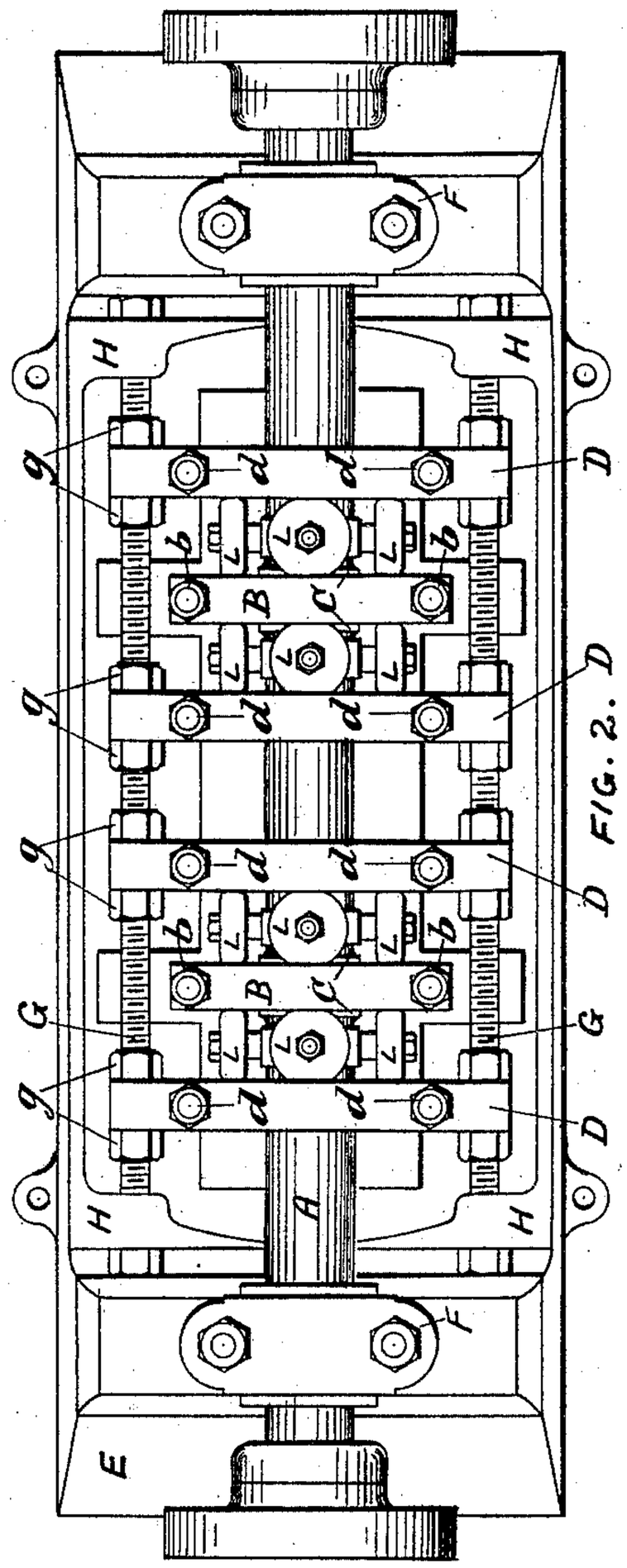

FIG. 2.

Witnesses
C. B. Bolton
S. J. Jones.

Inventors:
George Wilkes
Frederick Edwards
By Dewey & Co.
their Attorneys.

(No Model.) 2 Sheets—Sheet 2.

G. WILKES & F. EDWARDS.

ANTI-FRICTION THRUST BEARING.

No. 482,430. Patented Sept. 13, 1892.

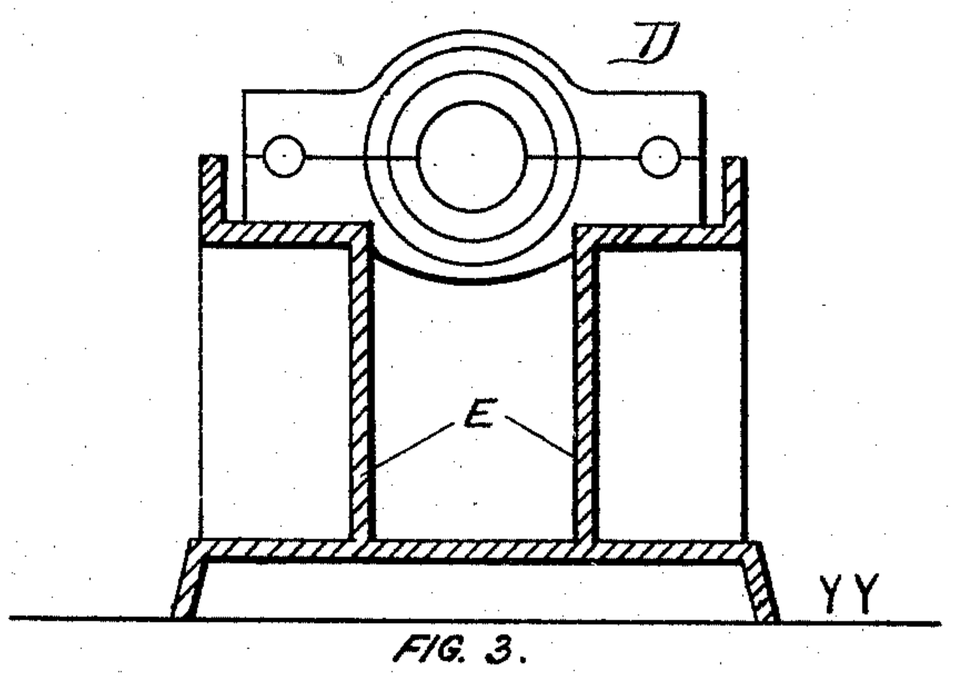

FIG. 3.

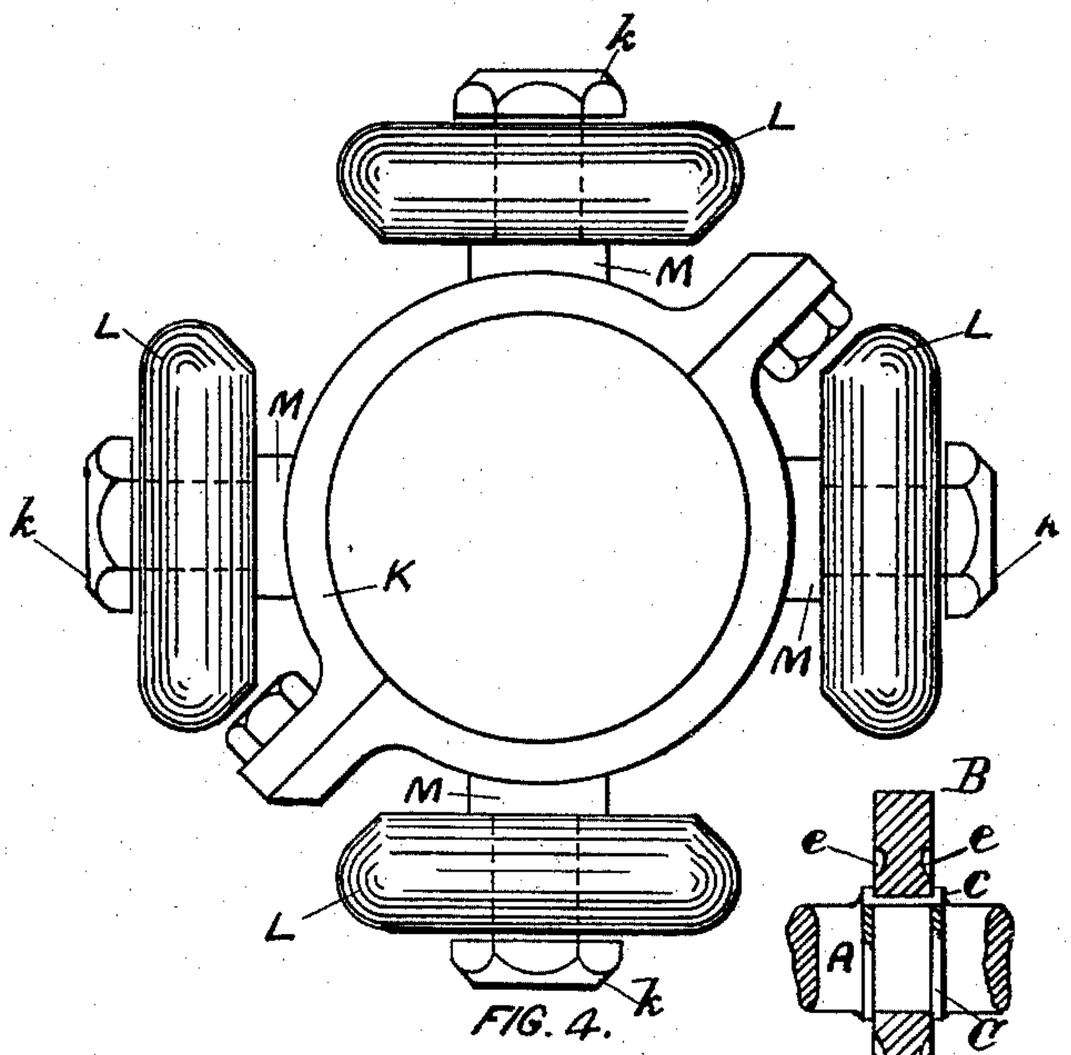

FIG. 4.

FIG. 7.

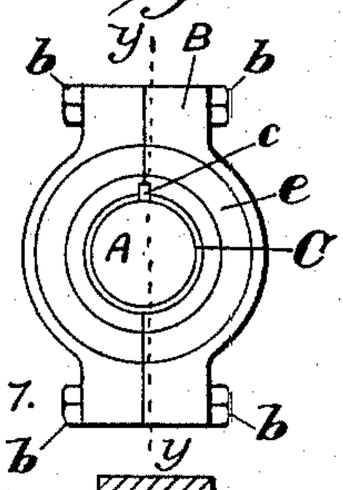

Fig. 6.

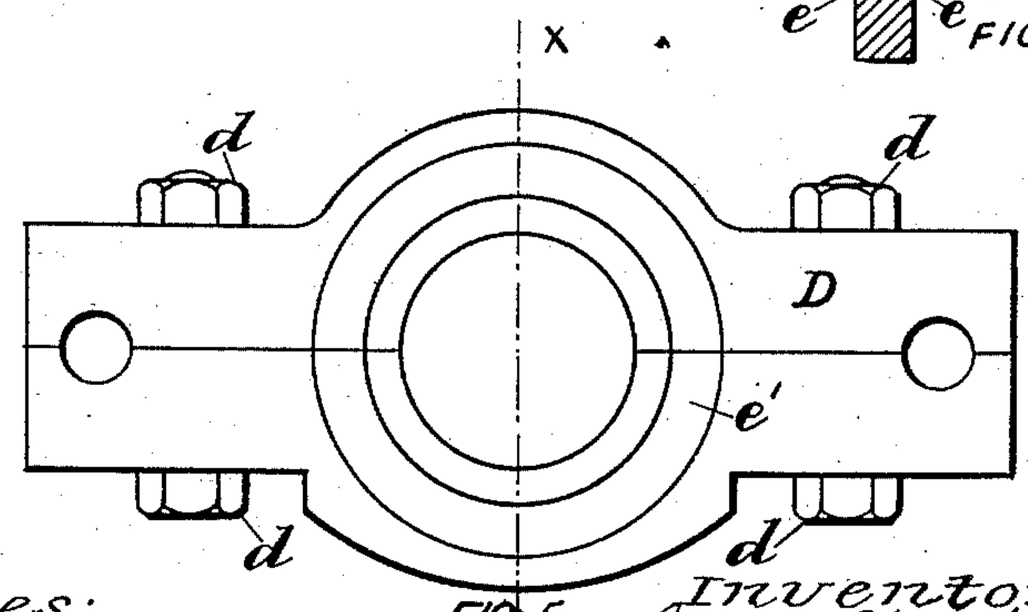

FIG. 5.

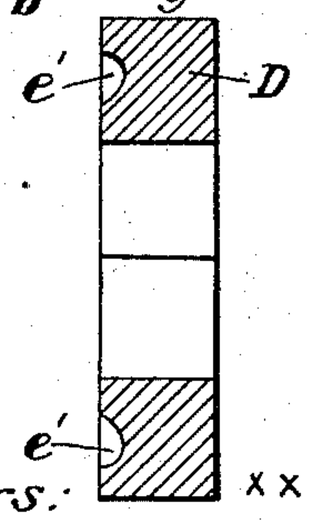

FIG. 6.

Witnesses:
E. R. Bolton
S. J. Jones.

Inventors:
George Wilkes
Frederick Edwards
By Reeves & R
their Attorneys

UNITED STATES PATENT OFFICE.

GEORGE WILKES AND FREDERICK EDWARDS, OF SOUTHAMPTON, ENGLAND.

ANTIFRICTION THRUST-BEARING.

SPECIFICATION forming part of Letters Patent No. 482,430, dated September 13, 1892.

Application filed May 3, 1892. Serial No. 431,695. (No model.) Patented in England September 11, 1890, No. 14,317.

To all whom it may concern:

Be it known that we, GEORGE WILKES and FREDERICK EDWARDS, residing at Southampton, England, have invented an Improvement in Antifriction Thrust-Bearings, (which has been patented in part in Great Britain under No. 14,317, dated the 11th of September, 1890,) of which the following is a specification.

Our invention relates to antifriction-bearings for taking the end-thrust of shafts, such as a propeller or vertical and other shafts.

Our invention consists in the special arrangement and construction of parts of such a device, whereby the result may be obtained in an efficient manner with a minimum loss of power due to friction.

In order that our invention may be the better understood, we will now describe it in relation to the accompanying drawings, reference being had to the letters and figures marked hereon.

Like letters and numerals refer to like parts in the various figures.

The particular bearing we will describe is one adapted to carry considerable end-thrust.

Figure 1 is a side elevation of the thrust-bearing complete. Fig. 2 is a plan of the same. Fig. 3 is a sectional end view on line *y y*, Fig. 1. Fig. 4 is a detail view of the rollers and carrying-frame. Fig. 5 is a detail view of one of the thrust-plates. Fig. 6 is a section of the same on line *x x*, Fig. 5. Fig. 7 shows the method of keying the thrust-plate to shaft, the view being a section on line *y y* of Fig. 8. Fig. 8 is a detail side view of the divided disk on the shaft.

Upon the shaft A we arrange one or more disk or shaft plates B at intervals along the shaft, so as to be rigidly fixed thereto and turn with the said shaft; and for convenience we prefer to construct these disk-plates B in at least two or in as many sectional parts as may be desired. These sectional parts are bolted together by bolts *b b* and are supported between collars C, which form part of the shaft A. To prevent any possibility of the said plates B turning around on the shaft, we cut a keyway through the disk-plate B and the said collars C, which does not thus reduce the strength of the shaft, and we fit a double-gibbed key *c* in the said keyway with the gibs coming up, one on either side of the plate B, which thus locks the said gib-key in place and is itself securely held from turning by the key *c*. Upon each side of each of the disk-plates B we arrange another thrust-plate D, also divided into two or more sectional parts round the shaft A and jointed by bolts *d*. These plates D do not touch the shaft, but are supported at their ends upon the framework E, which also carries ordinary bearings F. The plates D are maintained in position and resist the thrust through the medium of screwed bolts G, with nuts *g* supported in and attached to lugs H on the frame E. By the means of the nuts *g* the plates D can be adjusted according to requirements into definite positions.

The plates B have on each side an annular groove *e*, preferably of a specific curved shape, hereinafter more fully described, and the plates D have a similar groove on one side *e'*.

In the spaces between the plates B and D we arrange a collar K, also divided into two sectional parts and bolted together about the shaft A. This collar K carries pivotally the antifriction rollers L, which engage with and roll within the annular grooves *e e'* on the plates B and D, respectively, and thus the thrust is transmitted from the shaft A through the plates B, rollers L, plates D, and bolts G, to the frame E. The frame E is made, preferably, of a trough form, open at the top, and the thrust-plates D are bedded down upon a planed face, as shown in Fig. 3.

The particular conformation of groove and corresponding shape of the edge of rollers that we find it most useful to employ is that of the involute curve, so that it will be noticed that the two sides of the roller periphery and the groove are not symmetrical, but that one side—viz., the innermost, has an easy curve, and the other, or outermost, a much sharper curve. The particular method of constructing and applying this curve to the periphery of the wheels and to the grooves is that described in the specification of United States Letters Patent, No. 183,729, dated October 24, 1876.

It will be noticed that the nuts *k* upon the journals M, carried by the collar K, do not require to touch the rollers L or to be arranged to take any outward thrust from the said rollers, as such is taken by the periphery of the

rollers themselves at the sharp curved outer edge of the same upon the sharp curved outer edge of the grooved path of the plates B and D. Thus the whole of the friction of the device is rolling friction. It will be noticed that the openings 20 in the sectional plates D for the adjusting-rods are between the meeting faces of the said sections, one-half being formed in each. They are located directly adjacent to the bolts *d* for holding the two sections together.

Having now described our invention, what we claim is—

1. In combination, the frame, the shaft journaled therein, the plate B, fixed to the shaft, the plate D, fixed to the frame, the collar K, loose on the shaft and comprising the central hub part, and the journals extending radially about the said hub and free at their outer ends, the removable nuts on the said journals, and the antifriction-rollers held removably on said journals by the said nuts, the said plates B and D having grooves in which the rollers travel, said grooves being arranged to hold the rollers out of contact with the nuts, substantially as described.

2. In combination, the frame, the shaft, the plate D about the shaft, fixed to the frame, the collar loose on the shaft and carrying antifriction-rollers, the plate B on the shaft, and the means for holding the said plate B rigidly to the shaft, consisting of the collars C, fixed on the shaft and having notches, the key to extend through the said notches and along the surface of the shaft, the said plate B being formed in sections adapted to fit between the collars and having a key-seat to fit over the key, substantially as described.

3. In combination, the shaft, the frame, the plate B on the shaft, the loose collar having the antifriction-rollers, the plate D, formed in sections and having the openings 20 between said sections, the bolts *d* for securing the two sections together, and the screws G, passing through the openings 20 and connecting the plate D to the frame, substantially as described.

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

GEORGE WILKES.
FREDK. EDWARDS.

Witnesses:
JASPER P. BRADLEY,
JOSEPH HUNT.