

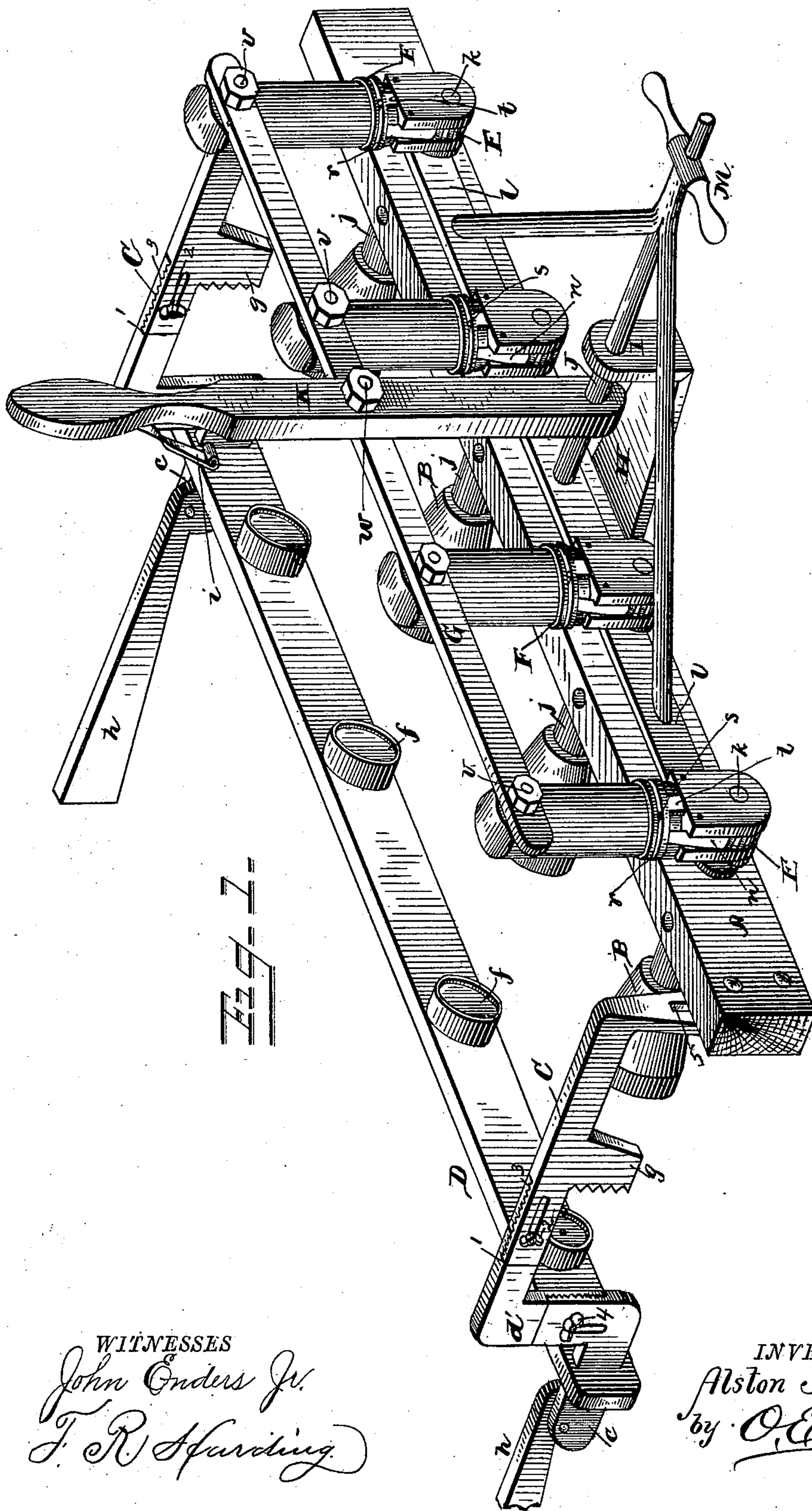
(No Model.)

2 Sheets—Sheet 1.

A. J. FORBES.
RAILROAD NUT WRENCH.

No. 336,908.

Patented Mar. 2, 1886.



WITNESSES
John Enders Jr.
F. R. Harding

INVENTOR
Alston J. Forbes.
by *O. E. Duff*
Attorney

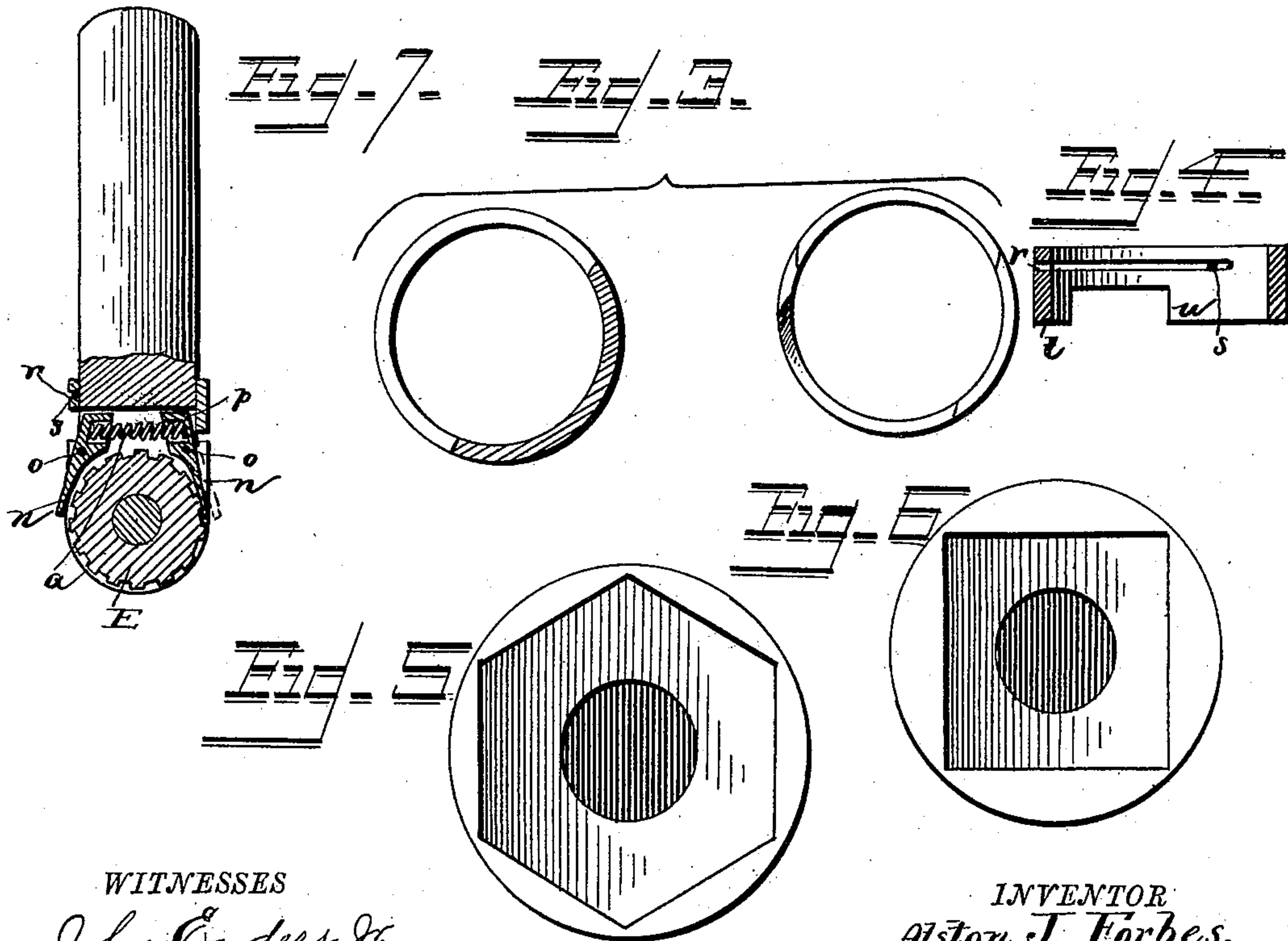
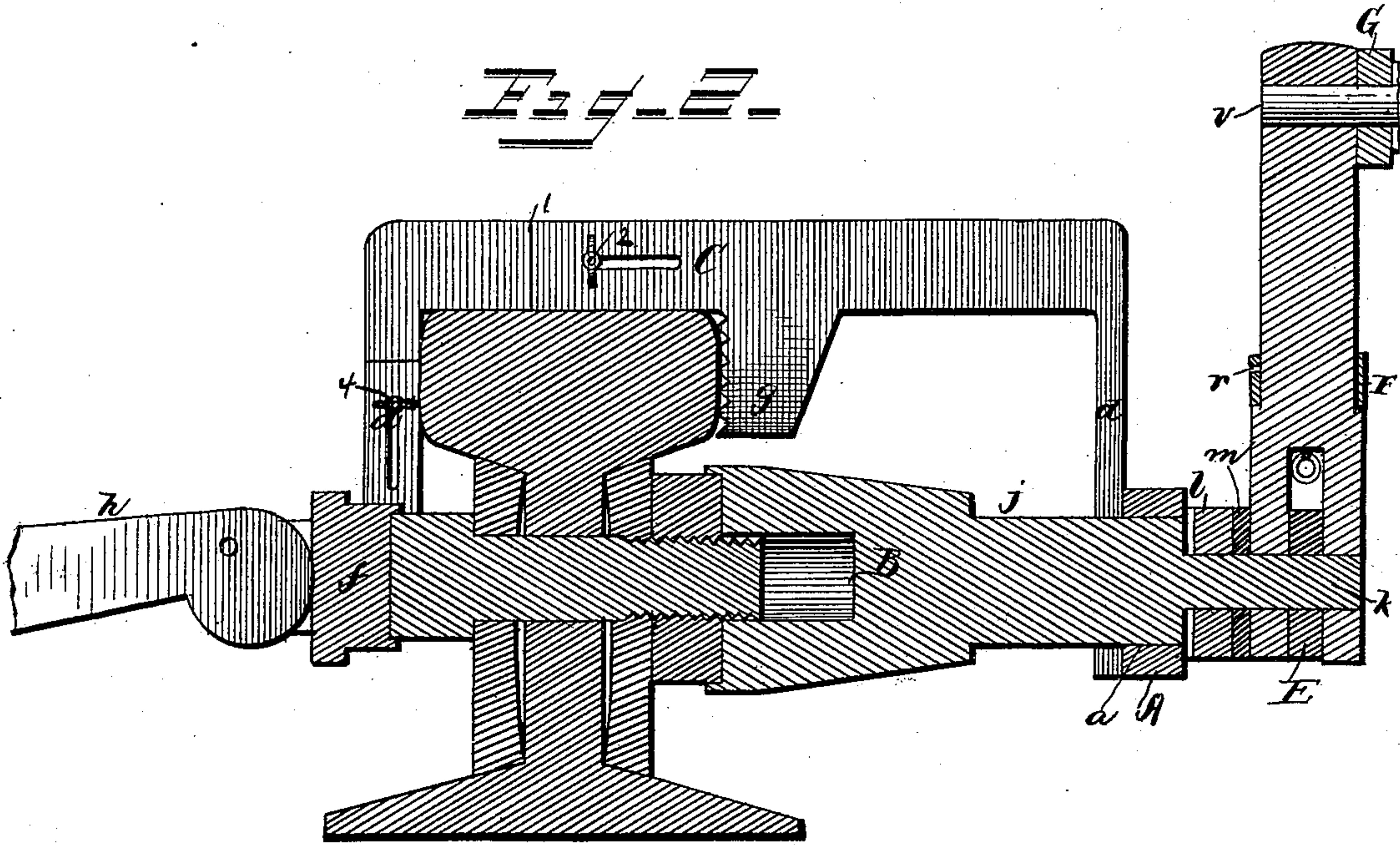
(No Model.)

2 Sheets—Sheet 2.

A. J. FORBES.
RAILROAD NUT WRENCH.

No. 336,908.

Patented Mar. 2, 1886.



WITNESSES

John Enders Jr.
J. R. Harding

INVENTOR

Alston J. Forbes.
by O. E. Duff
Attorney

UNITED STATES PATENT OFFICE.

ALSTON J. FORBES, OF CAMPBELL, TEXAS, ASSIGNOR OF ONE-HALF TO
VINCENT H. HENDERSON, OF SAME PLACE.

RAILROAD NUT-WRENCH.

SPECIFICATION forming part of Letters Patent No. 336,908, dated March 2, 1886.

Application filed May 15, 1885. Serial No. 165,659. (No model.)

To all whom it may concern:

Be it known that I, ALSTON J. FORBES, of Campbell, in the county of Hunt and State of Texas, have invented certain new and useful
5 Improvements in Railroad Nut-Wrenches; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same,
10 reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention has relation to nut and bolt wrenches particularly applicable to railroads,
15 but may be applied to bridges or machinery where a series of nuts and bolts may be screwed up or unscrewed simultaneously.

The object of the invention is to economize in time and to facilitate railroad-building, and
20 also to economize labor, inasmuch as one man using my wrench will be enabled to do the work of several men with the ordinary wrenches now in use.

The invention consists in combining with
25 suitable frame-work a series of socket-wrenches, to which are attached a series of pawls and ratchets, and to these are fixed the operating mechanism, whereby all or any number of the wrenches may be used simultaneously.

30 It further consists in peculiar clutching mechanism whereby the frame and wrenches are readily secured to the track for ready detachment therefrom.

Referring to the drawings hereto annexed,
35 Figure 1 represents a perspective view of my apparatus, showing all the parts ready for operation; Fig. 2, a transverse sectional view of the wrench in position for operation, showing the clutching or gripping device in elevation
40 and attached to the railroad-rail, said rail, tie-bolts, fish-plates, bolt-head holder, socket-wrench, and ratchet being in section. Fig. 3 is a plan view and sectional view of the ring which governs the movement of the ratchet,
45 the ring being shown in halves. Fig. 4 is a cross-section through the said governing-ring, clearly showing the guiding-slot which retains it in position by means of pin *s*. Figs. 5 and 6 are front views of the socket-wrenches,
50 showing the shape of two different kinds of

railroad-nuts. However, my invention may be adapted to any kind or shaped nut. Fig. 7 shows the ratchet-pawl, spring, and slotted ring, and pin *s* and ratchet-head.

A shows a plate, in which are journals *a*, in
55 which work the stems of the socket-wrenches B B, which have holes beyond the wrench portion for the reception of the bolt as it is screwed on. C C are clutching or gripping
60 bars, which are secured to the plate A at one end and pass through plate D at the other. These bars C C have two downward projections, *d d'*, whereby they are supported to
65 straddle the track, bringing the frame-plates A D and socket-wrenches opposite the bolt-holes in the rails. The projection *d* is rigidly bolted to the plate A, and projection *d'* has an
70 elongated extension, *e*, which passes through plate D, the extension *e* sliding loosely on said plate D, which will be hereinafter more fully described. The inner side of plate D is provided
75 with countersunk bosses *f f*, sufficient in number to correspond with the number of wrenches on plate A. The purpose of these bosses is to hold the bolt-heads from turning
80 and in position while the nut is being screwed on. The said cross-bars C C are also provided with short downwardly-projecting
85 jaws *g g*, which are serrated to more securely grip the rails to prevent the apparatus from slipping off. The projections *cc* of bars C are
90 provided with cam-levers *h h*, which when turned down bear the plate D hard against the head of the tie-bolts passing through the
95 rail of the track. At the ends *d'* of cross-bar C, I arrange springs *i*, as seen in Fig. 1, the object of which is to aid in releasing the plate
D from the head of the bolt when it is screwed up, and to keep it sufficiently apart from the
wrench-sockets to permit the ready replacement upon the next set of bolts. As a rule,
rail-bolts are the same length, but should there be a deviation, such is provided for by
the plate D, springs *i*, and cam-levers *h*.

So far I have mentioned the plates A D,
95 bars C C, sockets B B, &c. I will now proceed to describe the operating portion of the apparatus.

On the stems *j j* of sockets B, which pass through and are journaled in the plate A, are 100

smaller stems, *k k*, upon which is placed a plate, *l*, which performs the function of steady-
ing and stopping plate for the sockets *B*, and
just outside of plate *l*, I put washers *m*, which
5 serve as collars for the ratchets *E E* to work
against, and upon the outside of these collars
m the operating-ratchets are placed.

E E are ratchets, which are placed on the
ends or stems of the socket *B*. These ratch-
10 ets have the usual teeth, but are provided with
two pawls, *n n*, which are pivoted near their
upper ends by pintle *o*. These pawls have
recesses *p* in their heads, in which a spiral
spring, *q*, is inserted and secured. The object
15 of the spring is to throw the pawls into the
ratchet-teeth and hold them there in contact.
On the head of the ratchet is placed a con-
centric ring, *F*, having a slot, *r*, through its
periphery for about two-thirds of its circum-
20 ference, in which works a pin, *s*, which gov-
erns the distance the ring must turn from
either direction. This ring *F* is preferably
made in a single piece, and has from its lower
edge two projecting nibs or cams, *t u*, one be-
25 ing much wider than the other, and arranged
nearly opposite to each other.

The cross-bars *C C* are rendered adjustable
both vertically and longitudinally in the fol-
lowing manner: The cross-bar *C* is cut in two
30 sections at the point 1, and provided with
the thumb-screw 2 and the teeth 3, arranged
to operate in connection with the said screw,
whereby the straddle of the track is adjusted
longitudinally. The cross-bar *C* is adjusted
35 vertically by means of the projection *d'*, adja-
cent to the extension *c*, being provided with
the thumb-screw 4, and the sections and teeth
arranged therein in the same manner as before
mentioned, and on the other projection there is
40 placed a slot, 5, allowing it to be raised and low-
ered simultaneously with the other projection.
The object of making one wider than the
other is that passing the wide and narrow
cams over the two pawls at the same time
45 throws both of them out of gear, but by turn-
ing the ring until the narrow one is off the
pawl, which releases it and permits it to bite
on the teeth, the wide cam still holds the other
pawl out of gear, and thus only one is work-
50 ing; but when the ratchet is designed to be
worked in the opposite direction the ring is
partially turned, which releases the idle pawl
and throws it out of gear, when the heretofore
idle one then becomes in contact. Thus it will
55 be seen that all the cams may be made to work
the same way; or some may be idle, or some
may be screwing the nut on, while others may
be unscrewing by the same general movement.

At the upper portion of the ratchet-heads
60 I insert a crank-pin, *v*, in each head, and upon
these pins *v*, I place a plate or connecting-rod,
G, secured by nuts having washers between
them and the plate. To the bottom of plate
A, and about midway its length, I secure a
65 bracket-plate, *H*, having a lug, *I*, in which
works a shaft or spindle, *J*, one end of which

is also secured in plate *A*. Upon this shaft I
locate a lever or handle, *K*, which is also piv-
oted to an arbor, *w*, fixed to the plate *G*, to
which all the ratchet-heads are also fixed, so
70 that when the handle *K* is moved in either
direction the ratchet-heads are also moved,
and with them the socket-wrenches. The
plate *l* has secured to its side a bifurcated
handle, to draw off the socket-wrenches from
75 the nuts and bolts when they are screwed up;
and also acts as a means whereby the socket-
wrenches are caused to travel up with the nuts
as they are screwed on.

The operation may be briefly set forth as
80 follows: When the track is laid down and the
tie-bolts inserted, the apparatus is put on it,
straddling the rail. The bolts and wrenches be-
ing a corresponding distance apart, the nuts
are now started by hand. Preferably a man
85 should be putting them on ahead of the ma-
chine. The sockets are then put on the nuts,
the bosses on plate *D* being brought against
the heads of the bolts. The cam-levers *h h*
are now brought down when the bolt is fast.
90 The lever *K* is then taken hold of, and the four
ratchets rotate, while the four nuts are screwed
up simultaneously, or unscrewed, as the case
may be. Should any one or two require more
screwing than the other, the ratchets of
95 the tight bolts are thrown out of gear,
when the others may be screwed home. After
the four bolts are screwed tight, the cam-levers
h h are thrown up, the handle *M* is taken hold
of, and the machine loosened, when it is ready
100 for the next set. Thus it will be seen that
the work is readily, rapidly, and economically
done.

It is evident that sockets and bolt-head
holders may be placed on the plates *A D* to
105 slide thereon and be adjusted to the distance
between the bolts, where they are of irregu-
lar distances, and that the sockets could be
secured by set-screws, &c., without departing
from the spirit of my invention. 110

What I claim as new, and desire to secure
by Letters Patent, is—

1. In a railroad nut-wrench, the mechanism
for simultaneously screwing a series of bolts
or any number thereof, consisting of the bosses
115 *f*, fixed on the frame-work, in combination
with the socket-wrenches *B B*, journaled in
frame *A* and operated by the ratchets on the
end of the stem of the sockets, the two pawls
n n, the spring *q*, the ring *F*, having two cams,
120 *t u*, one being wider than the other, the cross-
piece *G*, and the handle *K*, all arranged to
operate substantially as set forth.

2. The combination of adjustable bars *C C*,
having the projections *g d d' c*, and the cam-
125 levers *h*, with the frames *A* and *D*, bosses *f*,
and sockets *B*, said sockets being operated by
the mechanism hereinbefore described.

3. The combination of the socket-wrenches
with the mechanism for operating the said
130 wrenches, either in whole or in part, consist-
ing of the ratchets, the pawls, the spring, the

ring having a slot and two cams of unequal size, cross-piece G, bolted to the ratchet-heads, and the handle-lever, as set forth.

4. In a railroad-wrench, the combination
5 of the sockets provided with stems or shanks and operated either in whole or in part by the ratchets placed on the said stems, the pivoted pawls engaging the teeth of the ratchets, the spring arranged in the recess of the
10 pawls, the concentric ring on the head of the ratchet having a slot and two downwardly-projecting cams of unequal size, the cross-piece, and the handle-lever with the plates A and D, as and for the purpose specified.

15 5. In a railroad-wrench, the combination of the bifurcated handle which operates the series of sockets to or from the bolt-heads,

with the actuating handle-lever, the ratchet mechanism for turning the series of sockets either in whole or in part, and the socket- 20 wrenches, as set forth.

6. In a railroad-wrench, the combination of lug H, which serves as a support for bifurcated handle and lever, the central spindle, J, which regulates the travel of the sockets, 25 and the handle-lever, all arranged to operate as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALSTON J. FORBES.

Witnesses:

JOHN ENDERS, Jr.,
O. E. DUFFY.