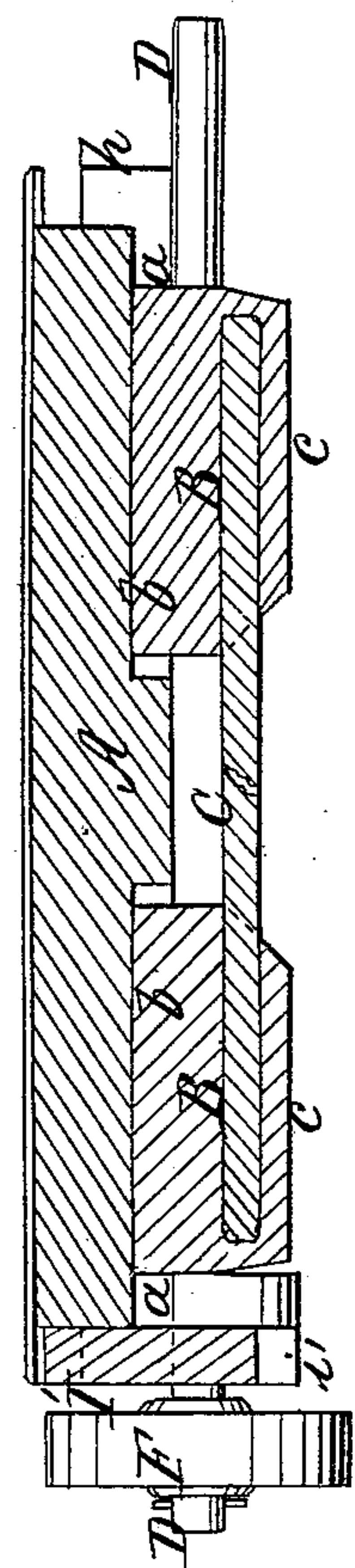


*J. Casho,*  
*Horse Power.*

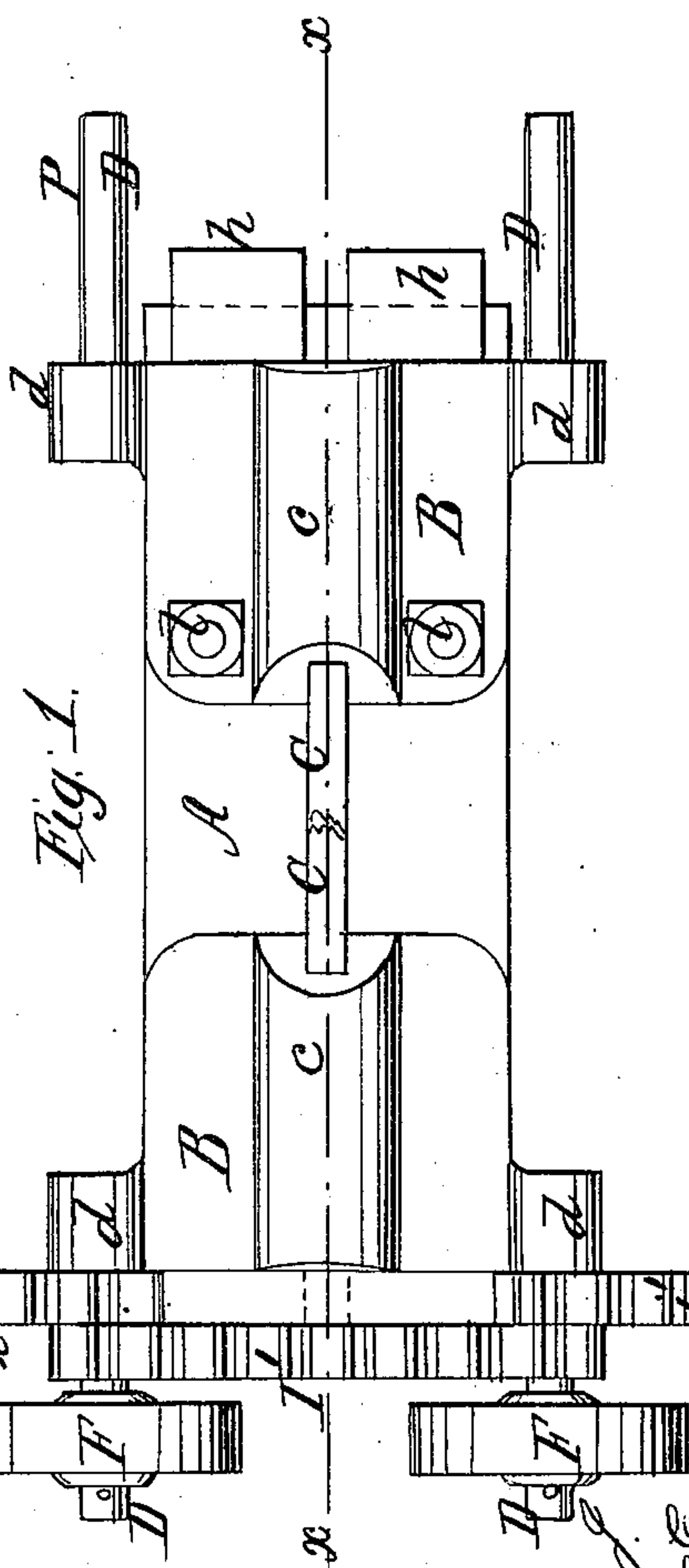
*N<sup>o</sup> 81,251.*

*Patented Aug. 18, 1868.*

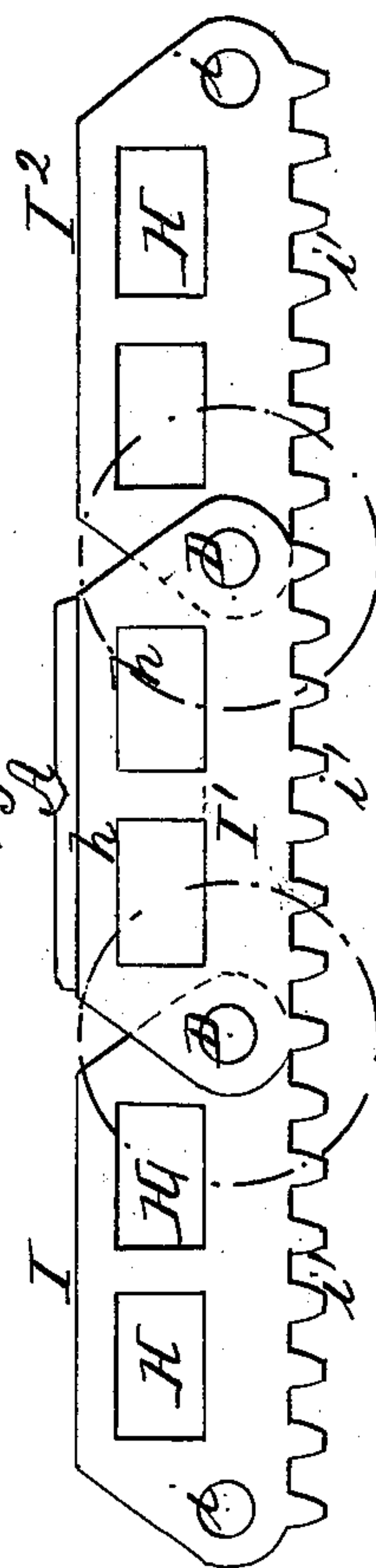
*Fig. 2.*



*Fig. 1.*



*Fig. 3.*



*Witnesses;*

*Jos. J. Peyton*  
*for S. C. Banks.*

*Inventor;*

*J. Casho*  
*by his atty*  
*Wm. D. Baldwin*

# UNITED STATES PATENT OFFICE.

JOSEPH CASHO, OF NEWARK, DELAWARE, ASSIGNOR TO CASHO & CO.,  
OF SAME PLACE.

## IMPROVED LINK FOR ENDLESS CHAIN FOR HORSE-POWERS.

Specification forming part of Letters Patent No. **81,251**, dated August 18, 1868.

*To all whom it may concern:*

Be it known that I, JOSEPH CASHO, of Newark, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Links for Endless-Chain Horse-Powers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a view of the under side of so much of my improved chain as is necessary to illustrate my invention. Fig. 2 represents a vertical section through the same at the line *x x* of Fig. 1; and Fig. 3 represents a view, in elevation, of the chain as seen from one side.

My invention relates to that class of horse-powers in which the horse walks on an endless chain traversing over suitable ways.

The most approved form of chain consists of transverse planks, having at each end friction-rollers to run on the ways, and connected by geared links, which drive the machine. These links and rollers are apt to become loose from the shrinkage of the wood or from the vibration of the mechanism.

The object of my invention is to secure an easy-working chain which will remain firmly secured to its planking; and the improvements herein claimed consist, first, in a novel method of combining the links and friction-rollers with the planking by means of a bracket, vertical through-bolts, and a longitudinal rib, fitting in a groove in the planking, to prevent lateral displacement; second, in a novel method of combining the brackets above described at each end of the plank by means of projecting shanks welded together.

In order to carry out my invention in the best way, each plank *A*, as shown in the accompanying drawing, has longitudinal vertical grooves *a* cut in its under side. A bracket, *B*, by preference of cast-iron, has a rib, *b*, on its under side to fit the groove *a*, and a socket, *c*, on its under side to receive the shank *C*. Journals *D*, for the rollers *F*, and links *I* project from lugs *d* on the bracket.

The shank and journals may be cast in with the bracket, if preferred.

The links *I* *I*<sup>1</sup> *I*<sup>2</sup> are made in the form shown, preferably of cast-iron, having eyes *i* at each end to fit on their journals, and rack-teeth *i'* on their under side to gear with the driving-pinions of the power.

Vertical and horizontal slots are cut in the ends of the planks, so as to leave tenons *h h*, which fit into the spaces *H* of the links.

In making the chain the rib *b* of the bracket is inserted in the groove *a*. The bracket is then secured to the plank by through-bolts *l*. The links are then slipped on the journals, the central one, *I*<sup>1</sup>, being fitted on its tenons *h h*, to hold it firmly. The friction-rollers are then slipped on the journals, and secured by linch-pins in the usual way.

The contiguous inner ends of the shanks *C* may be welded together, and a rigid connection be thus insured between the driving-links and the blocks.

By my improved mode of construction it will be seen that the links cannot spread apart, being held by the through-bolts or welded shanks, nor yield vertically, by reason of the links and through-bolts, while the rib *b* prevents any torsion of the through-bolts.

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

1. The combination of the grooved and slotted plank with ribbed journal-bearing, brackets, geared links, friction-rollers, and through-bolts, all arranged, as set forth, for joint operation.

2. The combination, substantially as set forth, of the grooved and slotted plank with ribbed journal-bearing brackets, each carrying geared links and friction-rollers, and secured to the plank by a shank connecting the brackets, for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

JOSEPH CASHO.

Witnesses:

WILLIAM JAQUETT,  
JAMES H. RAY.