

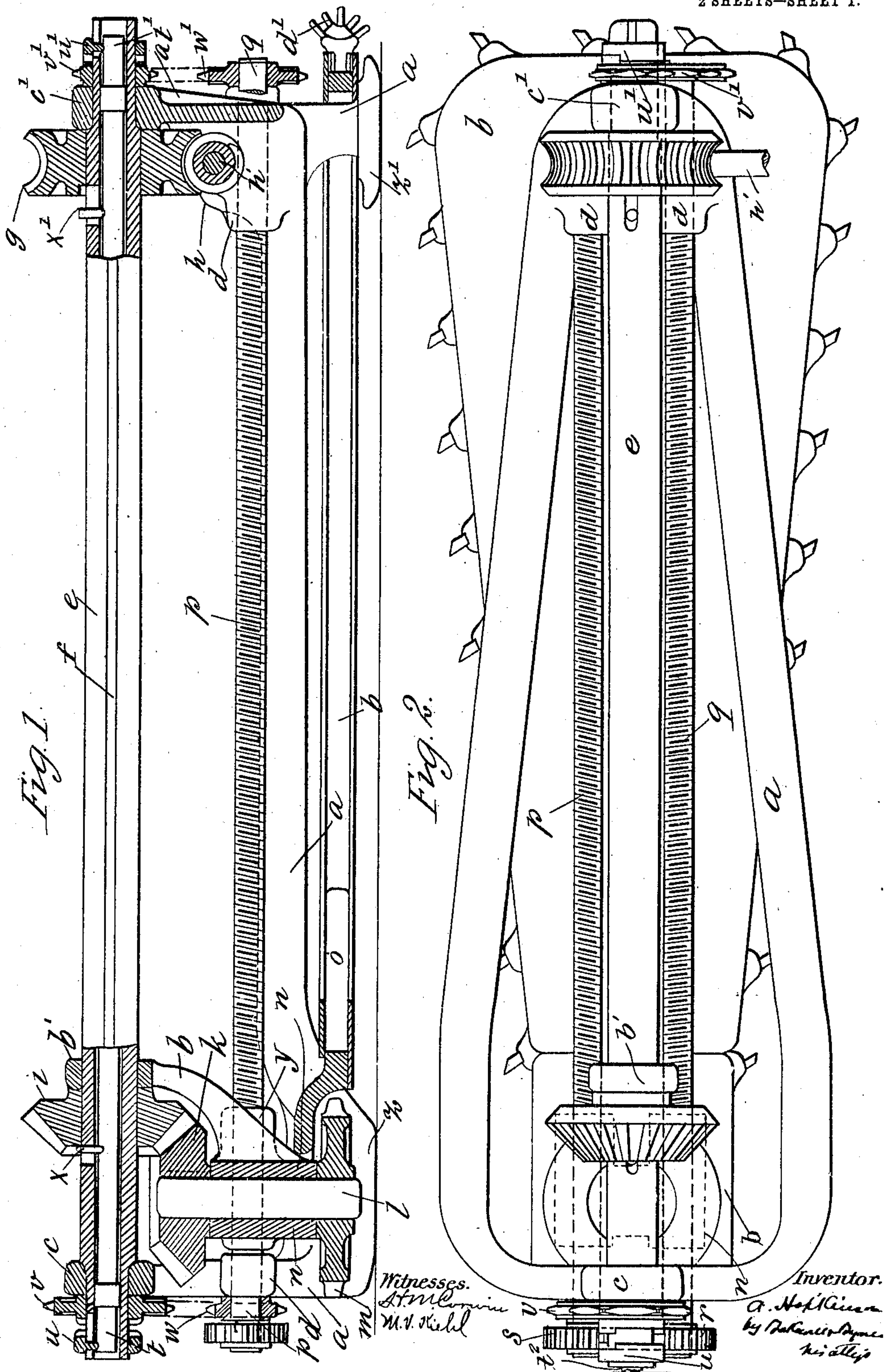
No. 871,592.

PATENTED NOV. 19, 1907.

A. HOPKINSON.
COAL CUTTING MACHINE.

APPLICATION FILED JAN. 30, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

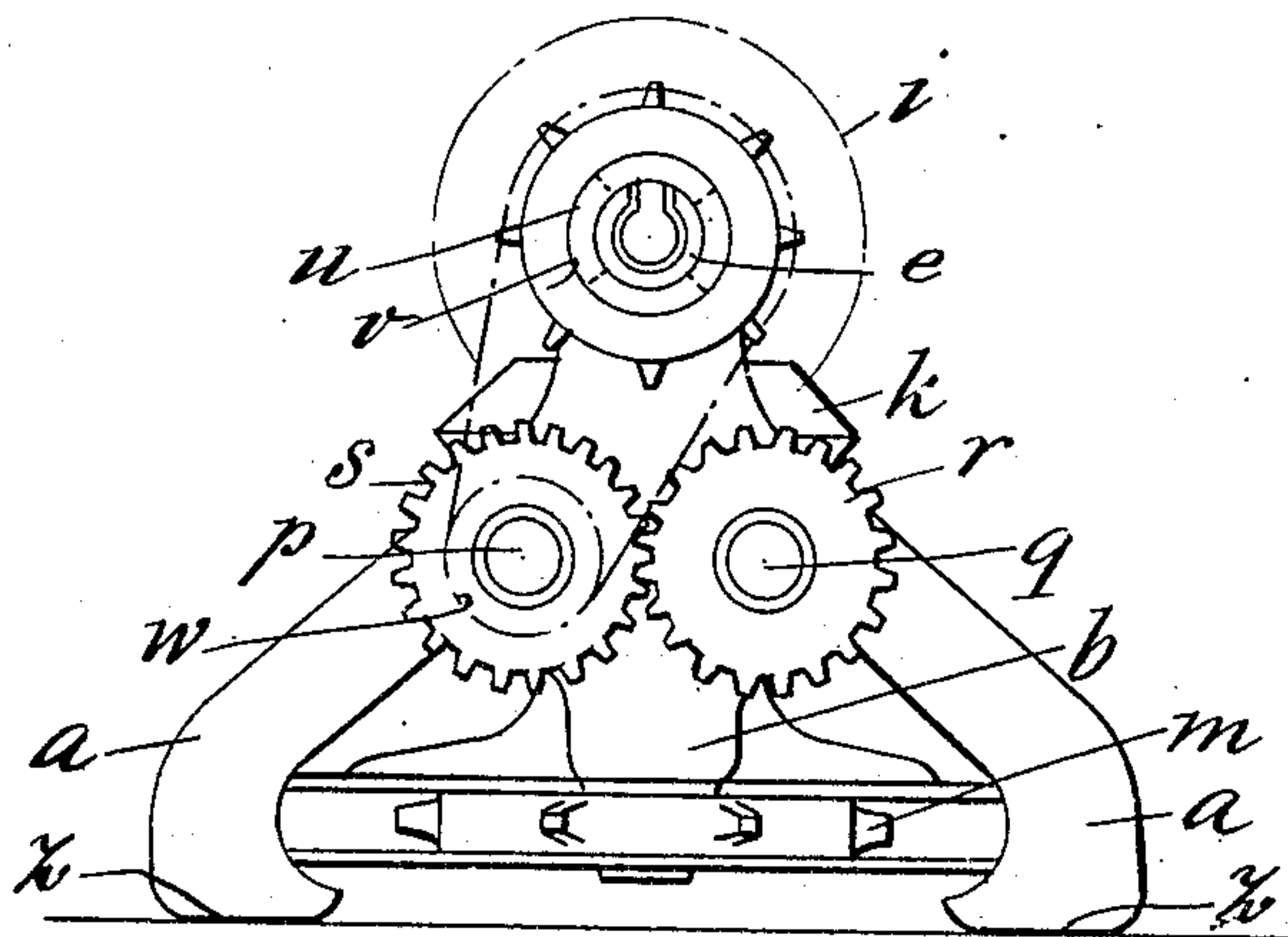


Fig. 4.

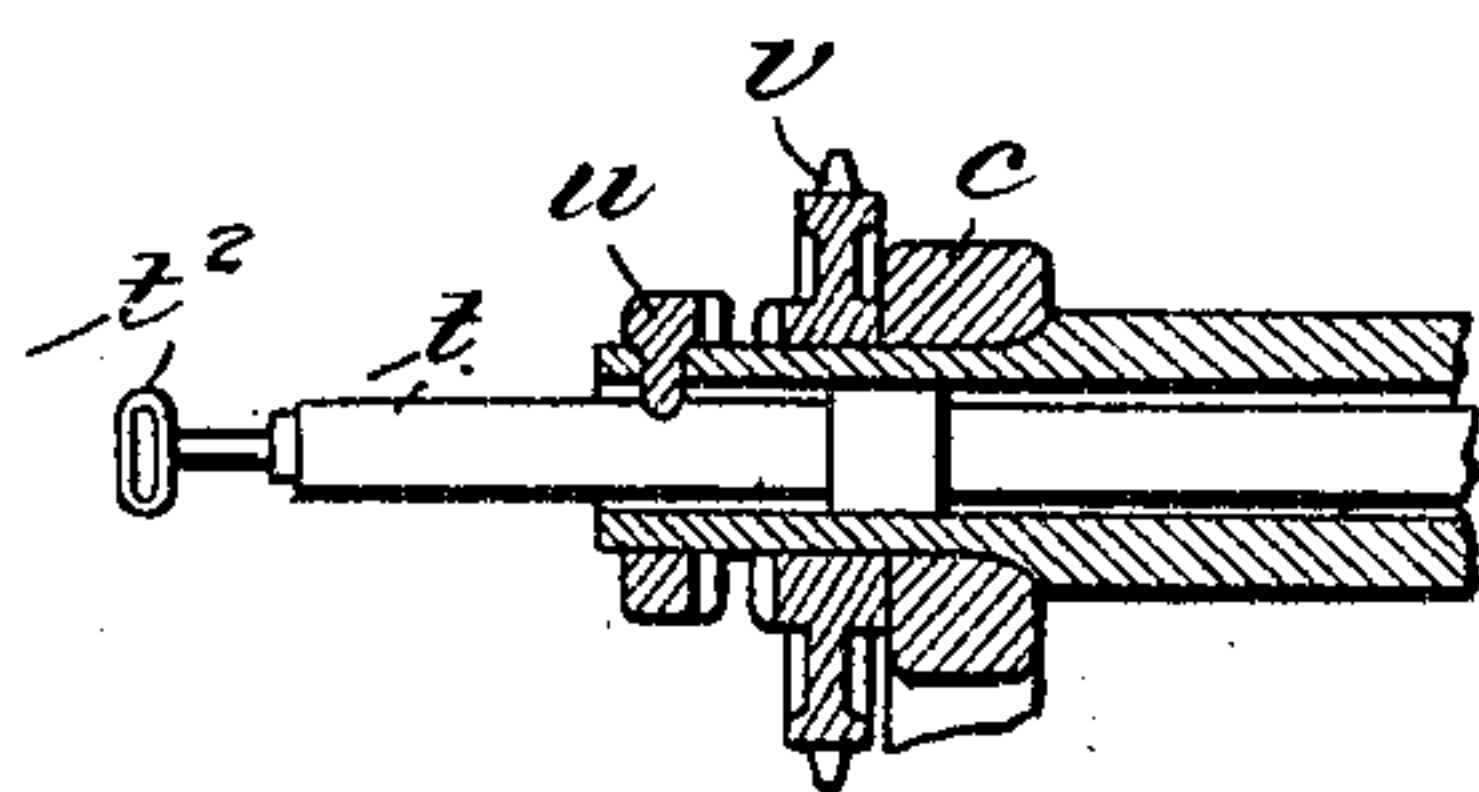
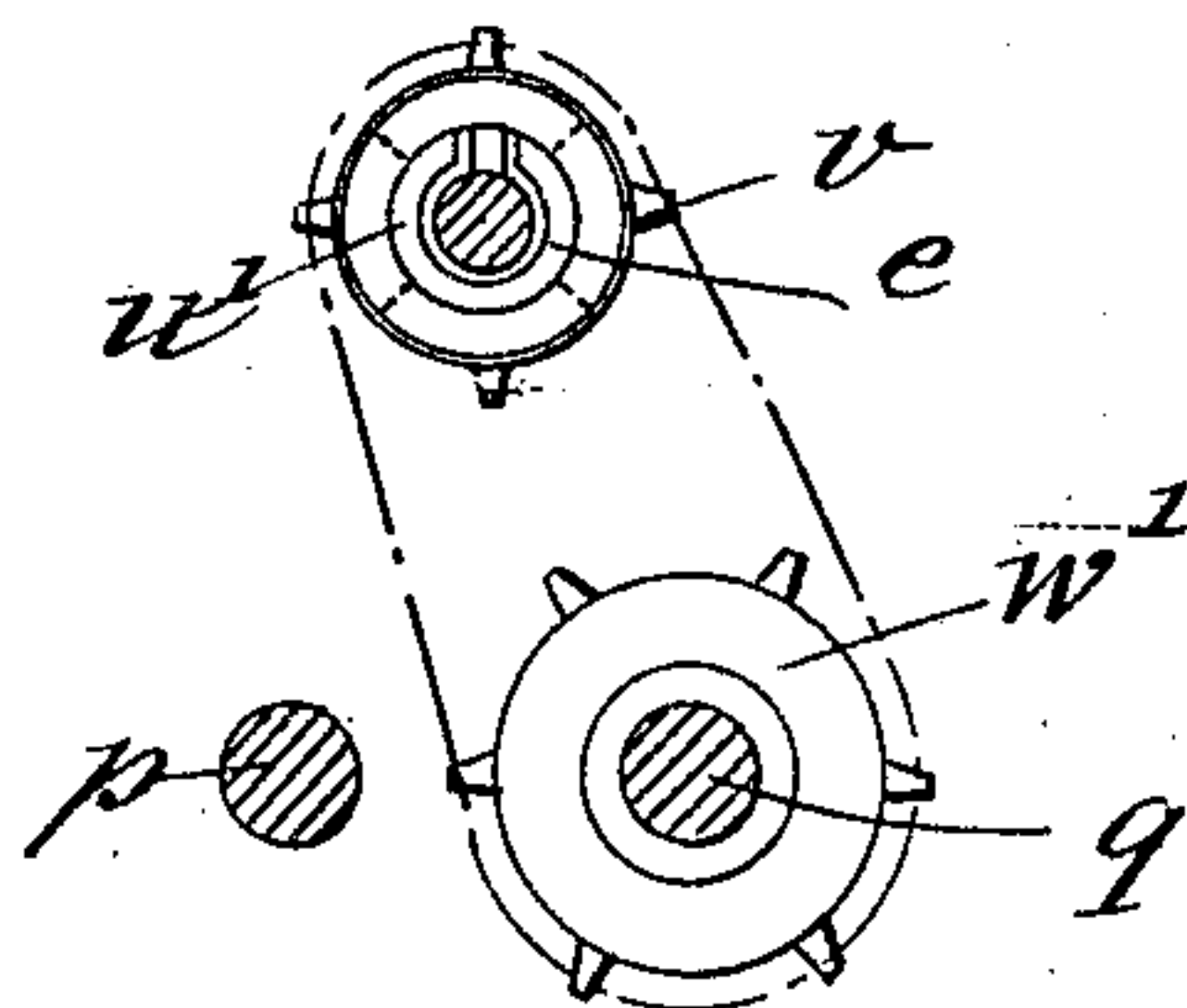


Fig. 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

AUSTIN HOPKINSON, OF MANCHESTER, ENGLAND.

COAL-CUTTING MACHINE.

No. 871,592.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed January 30, 1907. Serial No. 354,819.

To all whom it may concern:

Be it known that I, AUSTIN HOPKINSON, a subject of the King of Great Britain and Ireland, residing at 86 Cross street, Manchester, in the county of Lancaster, England, engineer, have invented certain new and useful Improvements in Coal-Cutting Machines, of which the following is a specification, (for which I have applied for a patent in Great Britain, dated July 18, 1906, No. 16,262.)

This invention relates to coal cutting machines, and more particularly to those of the type commonly known as chain heading machines which have hitherto been constructed with the motor and transmission gear fixed on the chain frame and traveling with the latter as the chain is fed into the face of the workings.

By the present invention the driving motor is separated from the moving frame, whereby the length of the machine normal to the working face is reduced practically to that of the chain frame itself, and is geared to the chain in such manner that only the last member of the train of gearing is carried by the moving frame which is thus relieved of the weight not only of the motor but also of the greater part of the transmission gear, with a corresponding reduction in the duty imposed on the feed gear.

The invention also includes an improved method of supporting the chain frame and of feeding the chain into the face of the workings, the feed gear being either controlled manually or being automatic in its action.

In the accompanying drawings, Figure 1 is a sectional elevation and Fig. 2 a plan view of a machine embodying the present invention, and Figs. 3 and 4 are respectively a partial end elevation and a detail illustrating the feed gear. Fig. 5 is a detail view of the handle t^2 .

The motor, which may be an electric motor or any suitable motor operated by fluid pressure and which for the sake of clearness is omitted from the drawings, is fixed to the stationary frame a or otherwise supported in definite relation thereto but separate from the movable chain frame b . At the ends of frame a are bearings c, c', d, d' , in the former of which is journaled the power shaft e which is driven from the motor by suitable gearing such as the worm wheel g and worm h keyed to a shaft h' driven by the motor. The shaft e has a keyway f or is of such section as will

constrain the bevel wheel i which is free to slide on the shaft to rotate with it.

The wheel i is held, by means of a bracket b' fixed to or integral with the moving frame, in gear with the bevel wheel k which is fast on the axle l of the chain wheel m . The axle l is journaled in bearings in the end of the frame b which also carries two sleeves n longitudinally movable on shafts p, q which are journaled in the bearings d, d' in the stationary frame a . These shafts, together with the inner foot or support o of the frame a , which projects through a slot in the movable frame, serve to support and guide the chain frame as it is advanced into and withdrawn from the coal seam. The chain will thus continue to receive motion from the prime mover whatever be the relative position of the frames a, b .

For feeding the chain frame, the shafts p, q are cut with right and left screw threads respectively and geared together as by gear wheels r, s to rotate in opposite directions, and the sleeves n are screw threaded internally or fitted with nuts screwed to engage the respective shafts p, q , and consequently cause the chain frame to be advanced or retracted according to the direction of rotation of the shafts p, q .

Reversal of motion of the chain frame is obtained by gearing both the shafts p, q with the unidirectional shaft e in such manner that either gear may be operative at will while the other is inoperative, or the change from one gear to the other may be made automatic as shown in the drawing. This is done by means of a tappet shaft t , which may be conveniently disposed inside the hollow driving shaft e to rotate therewith, carrying at its ends clutch members u, u' , adapted to clutch to the shaft e one or other of the loose driving sprockets or other suitable gear wheels v, v' according to the position of the tappet shaft. The sprockets v, v' are chain geared with sprockets w, w' respectively fixed on the shafts p, q to drive them in the same direction, so that each shaft will rotate in opposite directions when driven directly by its sprocket and when driven indirectly through the gear r, s respectively. The shaft t is shifted in a longitudinal direction by means of a handle t^2 or is displaced automatically to disengage one clutch and engage the other by means of tappets or pins x projecting through slots in the hollow shaft e and placed

to encounter any suitable part of the moving frame *b* at or about each end of the range of motion of the chain frame or at other convenient positions. Obviously the shaft *t* 5 may also be controlled manually by the operator.

Having thus described the nature of my said invention and the best means I know of carrying the same into practical effect, I 10 claim:—

1. In chain heading coal cutting machines, a movable chain frame, a prime mover cooperating therewith but supported independently of said frame, and feed gear comprising 15 two oppositely screw-threaded and oppositely rotating shafts engaging the chain frame and means for driving the shafts to traverse the frame alternatively in one direction or the other, substantially as described.

2. In chain heading coal cutting machines, 20 a movable chain frame, a prime mover cooperating therewith but supported independently of said frame and feed gear comprising two oppositely screw-threaded and oppositely rotating shafts engaging the chain 25 frame, means for driving the shafts to traverse the frame alternatively in one direction or the other, and means operating automatically to reverse the direction of the feed, substantially as described. 30

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AUSTIN HOPKINSON.

Witnesses:

WM. B. PARKINSON,
GEORGE F. WALTON.