May 29, 1923. 1,456,930

C. S. OLDROYD

MINING AND QUARRYING MACHINE

Original Filed June 24, 1919 4 Sheets-Sheet 1

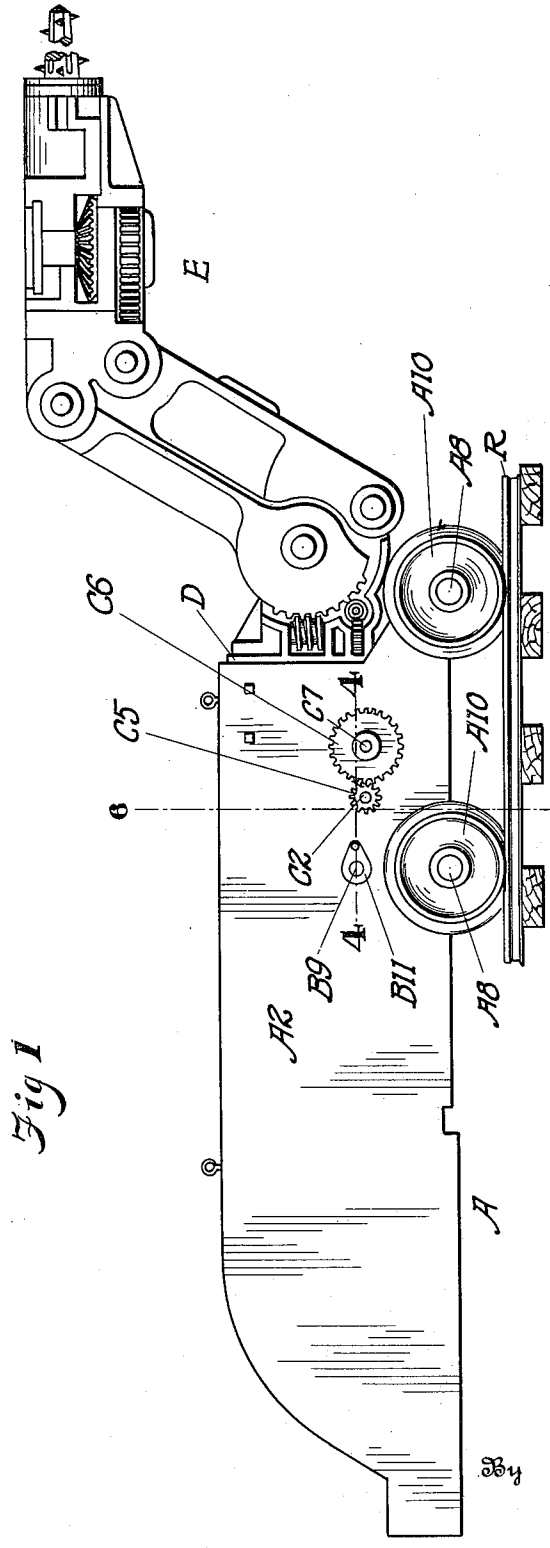

Fig 1

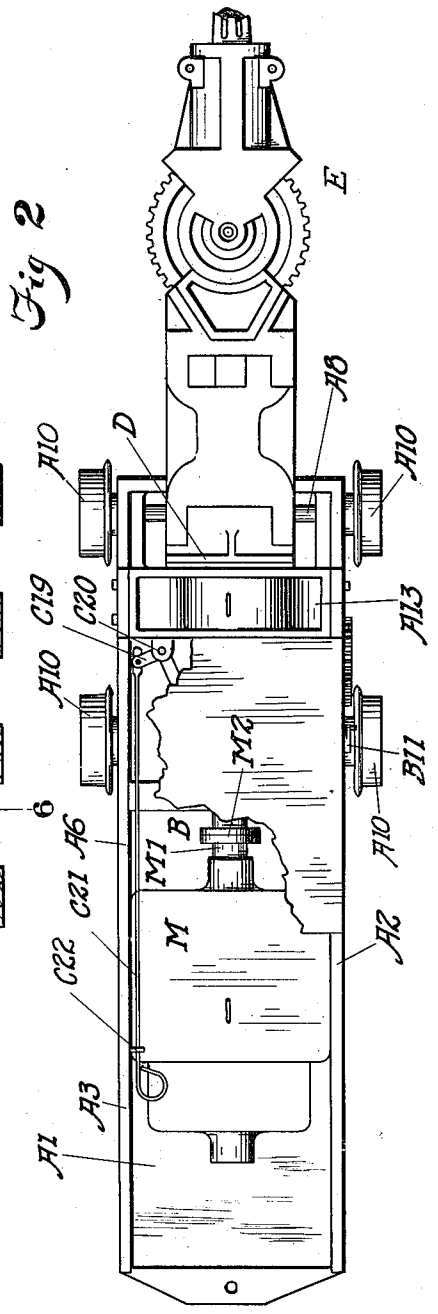

Fig 2

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May 29, 1923. 1,456,930

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MINING AND QUARRYING MACHINE

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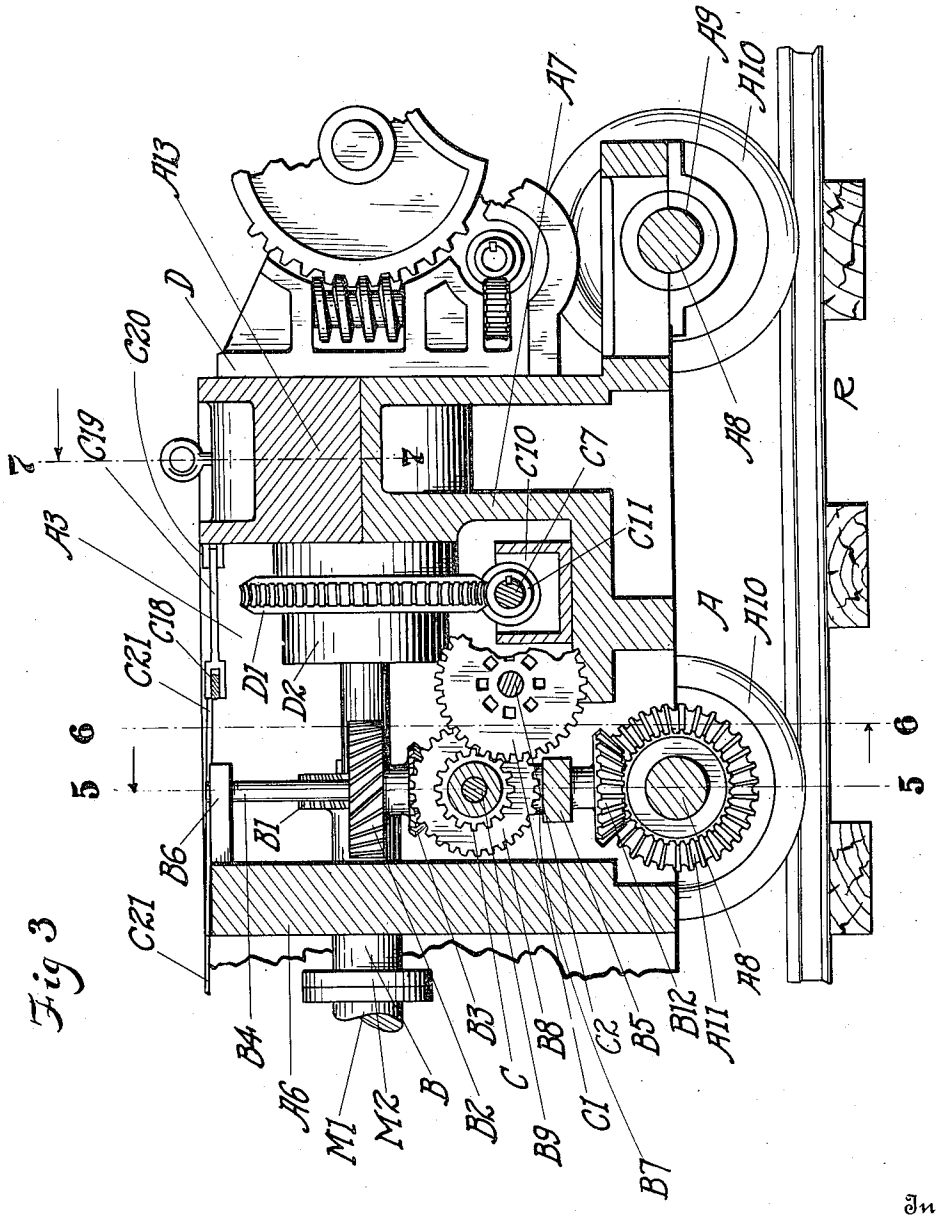

Fig 3

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May 29, 1923. 1,456,930

C. S. OLDROYD

MINING AND QUARRYING MACHINE

Original Filed June 24, 1919 4 Sheets-Sheet 3

Fig 4.

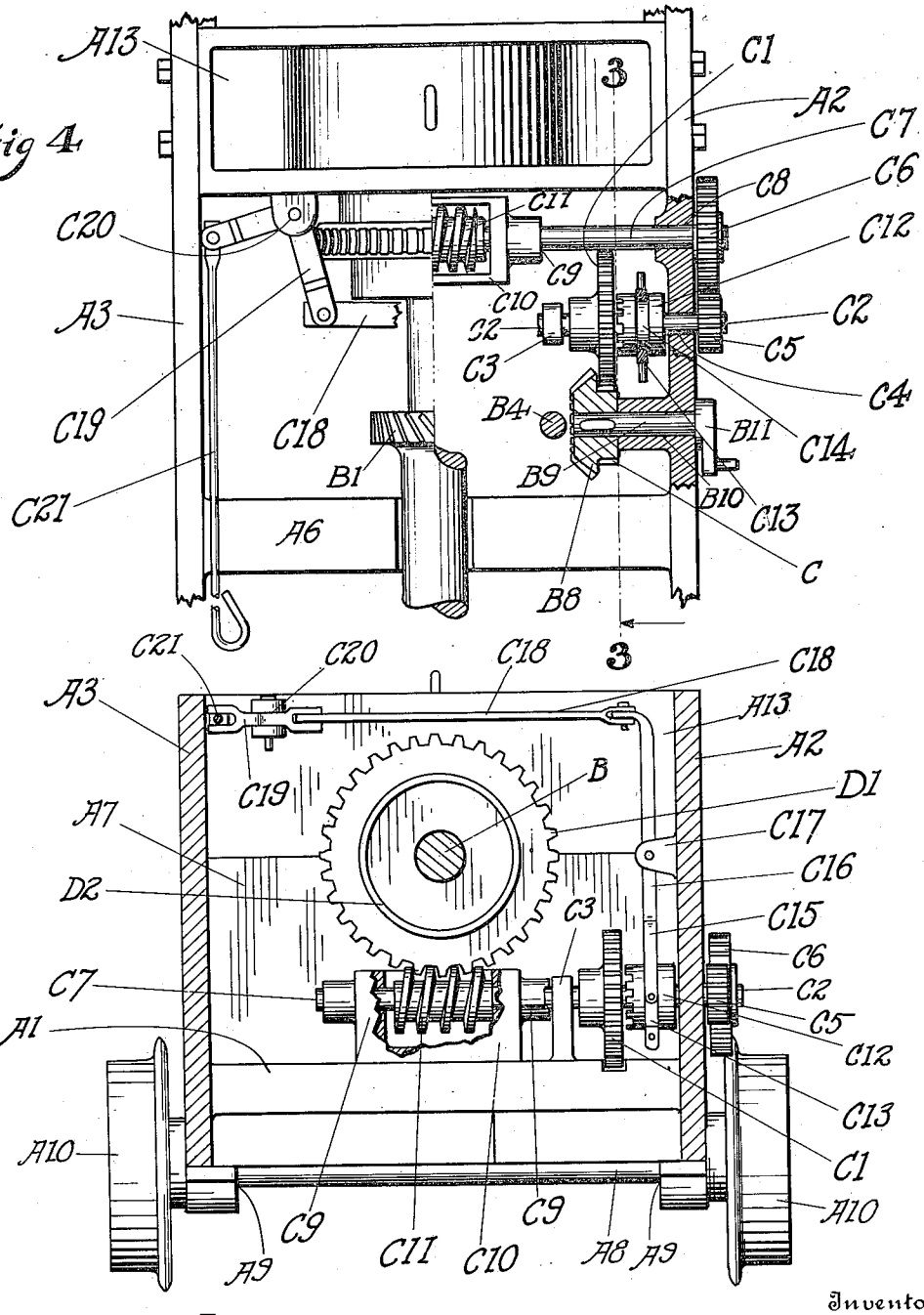

Fig 6

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May 29, 1923. 1,456,930

C. S. OLDROYD

MINING AND QUARRYING MACHINE

Original Filed June 24, 1919 4 Sheets-Sheet 4

Fig 7

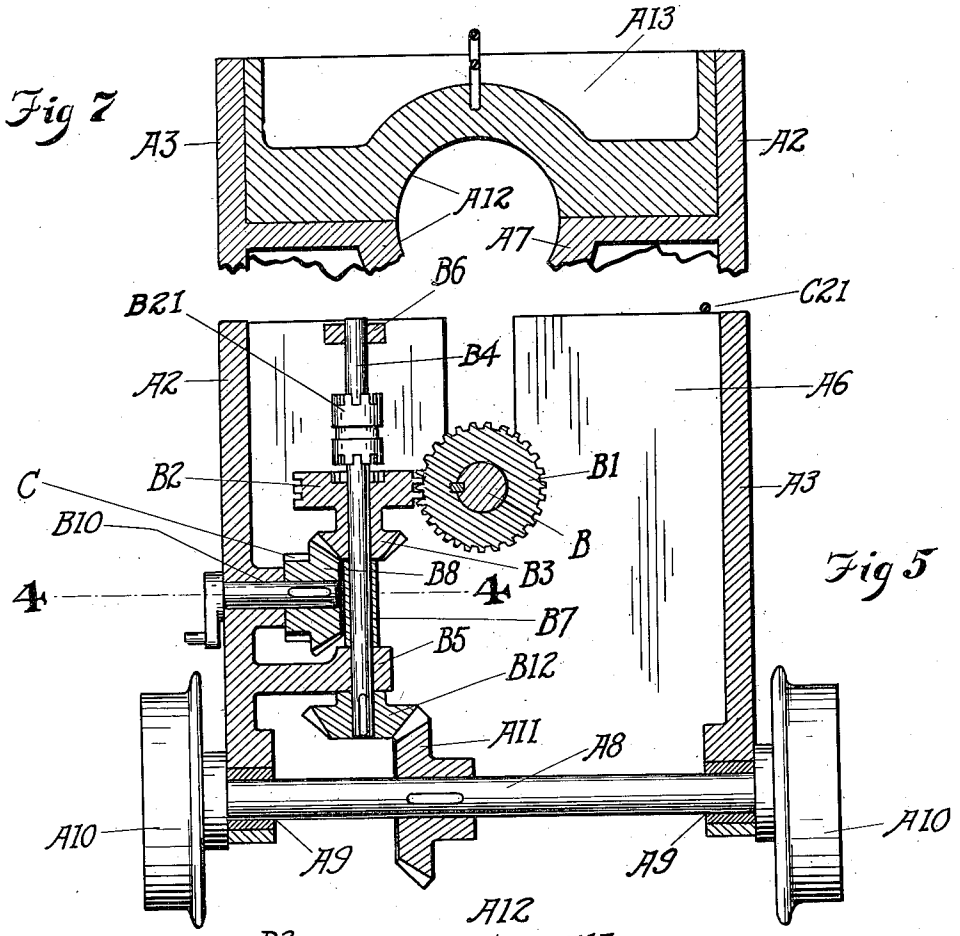

Fig 5

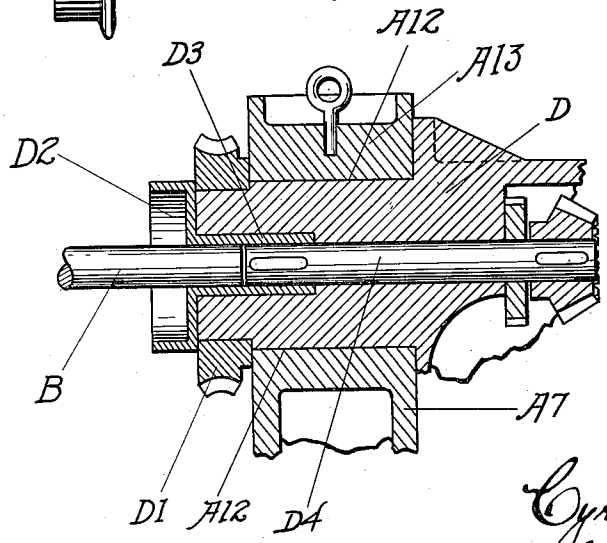

Fig 8

Inventor

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By Cyrus Kelz

Attorney

Patented May 29, 1923. 1,456,930

UNITED STATES PATENT OFFICE.

CYRUS S. OLDROYD, OF CINCINNATI, OHIO, ASSIGNOR TO OLDROYD MANUFACTURING COMPANY, OF KNOXVILLE, TENNESSEE, A CORPORATION OF TENNESSEE.

MINING AND QUARRYING MACHINE.

Application filed June 24, 1919, Serial No. 306,335. Renewed October 28, 1922. Serial No. 597,693.

To all whom it may concern:

Be it known that I, CYRUS S. OLDROYD, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Mining and Quarrying Machines, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to machines used for cutting into upright walls of coal, rock, or similar material, the machine comprising cutting means actuated by the machine and projected endwise into the wall of coal, or other material, and then moved sidewise to make a sweeping cut; the cutting mechanism being, however, adapted to cut in a variety of other ways.

By way of general statement, it may be said that the machine to which this invention relates consists of (1) a truck having a rigid frame or body and having supporting or traction wheels adapted to rest on ordinary rail tracks or on a floor; (2) a neck located at the front of the truck body and rotatable on a horizontal axis extending lengthwise of the machine and approximately in an upright plane cutting midway between the track rails; (3) and cutting mechanism supported by said neck and adapted to be adjusted for cutting in various directions.

The object of the present improvement is to provide an efficient means for at the will of the operator transmitting motion from a motor located on the body of the machine to the above-mentioned neck for turning the latter on its horizontal axis for the purpose of imparting to the cutting mechanism supporting means a portion of the movements to which said supporting mechanism is subjected for the change of direction of cutting.

For such cutting mechanism as has been above indicated, reference is here made to my application for Letters Patent of the United States, Serial Number 166,172, filed May 3, 1917, for an improvement in mining and quarrying machines.

In the accompanying drawings,

Fig. 1 is an elevation of the right hand side of a machine embodying my improvement, the cutting mechanism being shown the same as in my said application Serial Number 166,172;

Fig. 2 is a plan of the same machine, a part of the cutting mechanism being omitted and a part of the cover being broken away;

Fig. 3 is a longitudinal upright section on the line, 3—3, of Fig. 4, looking toward the left;

Fig. 4 is a sectional plan of a part of as much of the machine as is shown by Fig. 3, the right hand half of said figure being sectioned on the line, 4—4, of Figs. 1 and 5;

Fig. 5 is a section on the line, 5—5, of Fig. 3, looking toward the left;

Fig. 6 is an upright section on the line, 6—6, of Figs. 1 and 3, looking toward the right;

Fig. 7 is an upright section on the line, 7—7, of Fig. 3;

Fig. 8 is an upright section along the line of the neck of the cutting mechanism supporting means.

Referring to said drawings, A^{10}, are four track wheels resting on track rails, R. Said wheels are arranged in pairs on two horizontal axles, A^8. Each of said axles rests in bearings, A^9, formed on the lower part of the body, A, of the machine. Said body has a floor or bed, A^1, and a right hand upright wall, A^2, and a left hand upright wall, A^3, and a rear cross wall, A^6, and a front cross wall, A^7.

Immediately at the rear of the rear cross wall, A^6, is an electric motor, M, having a shaft, M^1, from which power is to be transmitted to the neck, D.

In the front cross wall, A^7, on the axial line of the motor, is a bearing, A^{12}, in which rests the neck, D, which supports the cutting mechanism, E. Said bearing is formed by cutting out the upper edge of the cross wall, A^7, and the lower edge of a bearing block, A^{13}, which rests upon the upper edge of the wall, A^7, and between the side walls, A^2 and A^3.

The rear end of the neck projects through said bearing and is there surrounded by a worm gear wheel, D^1, which bears against the rear face of said cross wall. By this means the forward movement of said neck is prevented. Immediately at the rear of the worm wheel is a friction clutch member, D^2, which has a sleeve, D^3, extending forward into the neck. A neck shaft, D^4, lying within the neck extends rearward into the forward portion of said sleeve and is keyed

to the sleeve, so that said clutch member and said sleeve and said shaft must rotate in unison. At the rear of the neck shaft, the sleeve, D^3, receives and forms a bearing for the forward end of the main transmission shaft, B, which is joined to the motor shaft, M^1, by means of a coupling, M^2.

The function of the neck shaft is to transmit power to the cutting mechanism as described in my said application Serial Number, 166,172. Rotation is imparted to the worm wheel, D^1, and the neck, D, by the mechanism which will now be described.

On the main transmission shaft, B, is a spiral gear wheel, B^1, which meshes with a spiral gear wheel, B^2, which is loose on the upright shaft, B^4, which rests in bearings, B^5 and B^6. On the bearing, B^5, rests the lower end of a spacing sleeve, B^7, which loosely surrounds the shaft, B^4, and supports a bevel gear wheel, B^3, which is cast integral with the spiral gear wheel, B^2. The bevel gear wheel, B^3, meshes with the bevel gear wheel, B^8, which is fixed on a shaft, B^9, resting in a bearing, B^{10}, and extending through the side wall, A^2. On the shaft, B^4, is feathered a jaw clutch, B^{21}, which is adapted to engage in the upright face of the wheel, B^2, for the transmission of motion from said wheel, to said shaft. A bevel gear wheel, B^{12}, is fixed on the lower end of said shaft and meshes with a bevel gear wheel, A^{11}, which is fixed on one of the axles, A^8. Thus motion is transmitted from the main transmission shaft, B, to said axle.

Integral with the bevel gear wheel B^8, is a spur gear wheel, C, which meshes with a spur gear wheel, C^1, which loosely surrounds a shaft, C^2, which is horizontal and transverse to the length of the machine and has one end resting in a bearing, C^3, rising from the floor of the body of the machine and having its other end resting in a bearing, C^4, formed in the right hand upright wall, A^2, of the machine body. Said shaft extends outward through said wall and there has fixed upon it a spur gear wheel, C^5, which meshes with a larger spur gear wheel, C^6, which is fixed on the shaft, C^7, which is horizontal and transverse to the length of the machine and rests in the bearing, C^8, and in bearings, C^9, formed in the end walls of an oil trough, C^{10}. Between the two bearings, C^9, the shaft, C^7, bears a gear worm, C^{11}, which engages the worm wheel, D^1, already described as being supported on the neck, D.

Constant rotation is imparted from the spiral gear wheel, B^1, through the bevel gear wheels, B^3 and B^8, and the spur gear wheel, C, to the spur gear wheel, C^1. But since the latter wheel is normally loose on the shaft, C^2, said shaft does not rotate excepting when engagement between said shaft and said wheel is effected by means of the jaw clutch, C^{12}, which surrounds the shaft, C^2, and is feathered thereto to permit sliding endwise and to compel rotation with the shaft. When said clutch is in engagement with the wheel, C^1, the clutch and the shaft, C^2, take motion from said wheel. A ring, C^{13}, rests in an annular groove, C^{14}, formed on the clutch. The fork, C^{15}, of the upright clutch lever, C^{16}, engages said ring. Said lever is pivoted to an ear, C^{17}, placed on the inner face of the wall, A^2. The upper end of said arm is coupled to the right hand end of a connecting bar, C^{18}, which is horizontal and transverse to the length of the machine and has its opposite end coupled to one arm of a bell crank, C^{19}, which is located in a horizontal plane and hinged at C^{20}, to the rear face of the bearing block, A^{13}. To the other arm of the bell crank is coupled the forward end of a slide rod, C^{21}, which extends rearward through a guide, C^{22}, formed on the inner face of the left hand wall, A^3. When the operator shifts said rod forward the fork, C^{15}, and the clutch, C^{12}, move away from the wheel, C^1; and shifting the rod, C^{21}, rearward causes the movement of the fork, C^{15}, and the clutch toward the wheel, C^1.

The trough, C^{10}, is to contain sufficient oil to partially immerse the worm, C^{11}, whereby the worm takes oil for the lubrication of the engagement between the worm and the worm wheel, D^1.

I claim as my invention,

1. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated rotatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is on said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmission shaft, and gearing intervening said second gear wheel and said worm shaft for transmitting motion to said shaft, substantially as described.

2. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated rotatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is on said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmision shaft, and motion reducing gearing intervening said second gear wheel and said worm shaft for trans-

mitting motion to said shaft, substantially as described.

3. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated rotatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is on said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmission shaft, gearing intervening said second gear wheel and said worm shaft for transmitting motion to said shaft, and a clutch applied to a portion of said intervening gearing, substantially as described.

4. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated rotatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is on said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmission shaft, motion reducing gearing intervening said second gear wheel and said worm shaft for transmitting motion to said shaft, and a clutch applied to a portion of said intervening gearing, substantially as described.

5. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated rotatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is on said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmission shaft, a plurality of shafts intermediate the transmission shaft and the worm shaft, and gearing on said intermediate shafts, substantially as described

6 In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated ratatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is on said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmission shaft, a plurality of shafts intermediate the transmission shaft and the worm shaft, gearing on said intermediate shafts, and a clutch on one of the intermediate shafts, substantially as described

7. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of a cutting mechanism supporting means having a neck seated rotatably in said bearing, a worm gear wheel seated on said neck, a worm shaft transverse to said neck and having a worm engaging said worm wheel, a power transmission shaft which is an said axial line, a first gear wheel on said shaft, a second gear wheel meshing with the first and having an axial line which is transverse to said transmission shaft, gearing intervening said second gear wheel and said worm shaft for transmitting motion to said shaft, a clutch applied to a portion of said intervening gearing, an upright clutch arm applied to said clutch, a horizontal bell crank, a horizontal connecting bar having one end coupled to the clutch arm and having its other end coupled to one arm of the bell crank, and a shift rod coupled to the other arm of the bell crank, substantially as described.

8. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of track wheels and axles, a cutting mechanism supporting means having a neck seated rotatably in said bearing, a main transmission shaft which is on said horizontal axis and has its forward end extending loosely into said neck, and clutch-controlled gearing intervening said main transmission shaft and said neck for rotating the latter, substantially as described.

9. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of track wheels and axles, a cutting mechanism supporting means having a neck seated rotatably in said bearing, a main transmission shaft which is on said horizontal axis and has its forward end extending loosely into said neck, clutch-controlled gearing intervening said transmission shaft and said neck for rotating the latter, and clutch-controlled gearing intervening said main transmission shaft and one of said axles, substantially as described.

10. In a machine of the nature described, the combination with a body having a bearing which is on a longitudinal, horizontal axis, of track wheels and axles, a cutting mechanism supporting means having a neck seated rotatably in said bearing, a main transmission shaft which is on said hori-

zontal axis, an upright shaft, gearing intervening said shaft and one of said axles, clutch controlled gearing between said upright shaft and the main transmission shaft for transmitting motion from the main transmission shaft to said upright shaft, and clutch-controlled gearing intervening said neck and the gearing which intervenes said upright shaft and the neck transmission shaft, substantially as described.

In testimony whereof I have signed my name, this 20th day of June, in the year one thousand nine hundred and nineteen.

CYRUS S. CLDROYD.