W. H. & R. METZLER.

TRENCH DIGGER.

APPLICATION FILED APR. 17, 1916.

1,229,116.

Patented June 5, 1917.

2 SHEETS—SHEET 1.

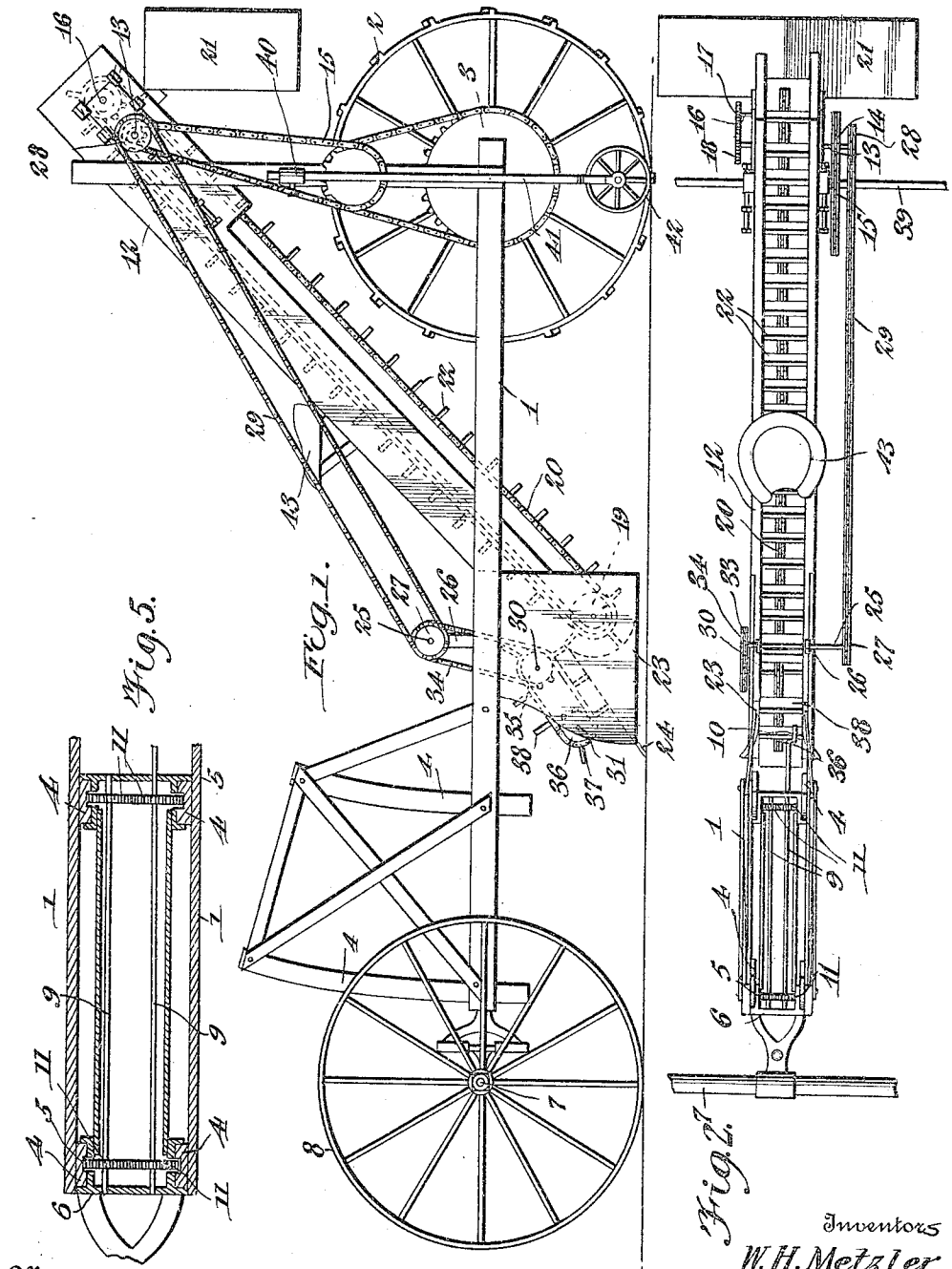


Fig. 1.

Fig. 5.

Fig. 2.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

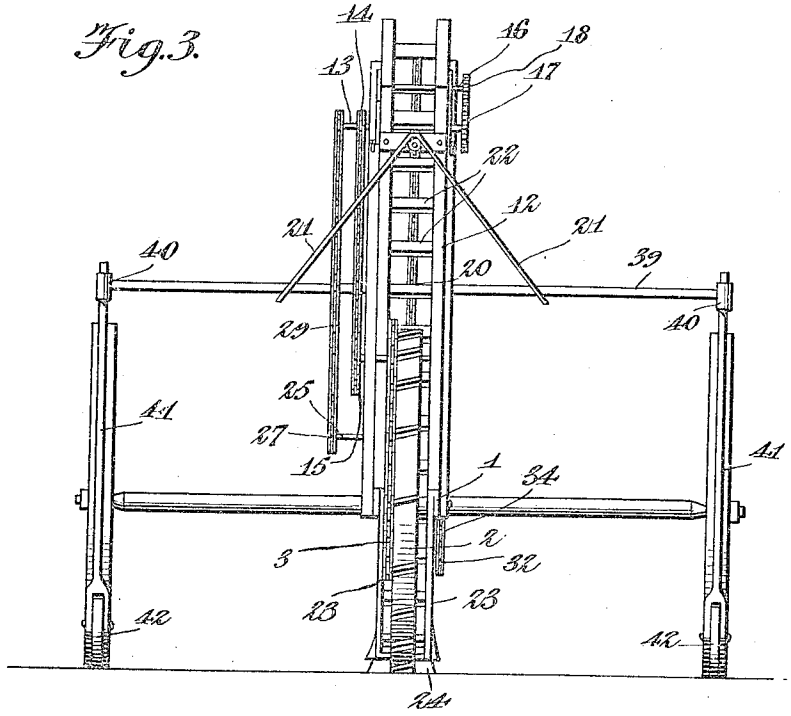
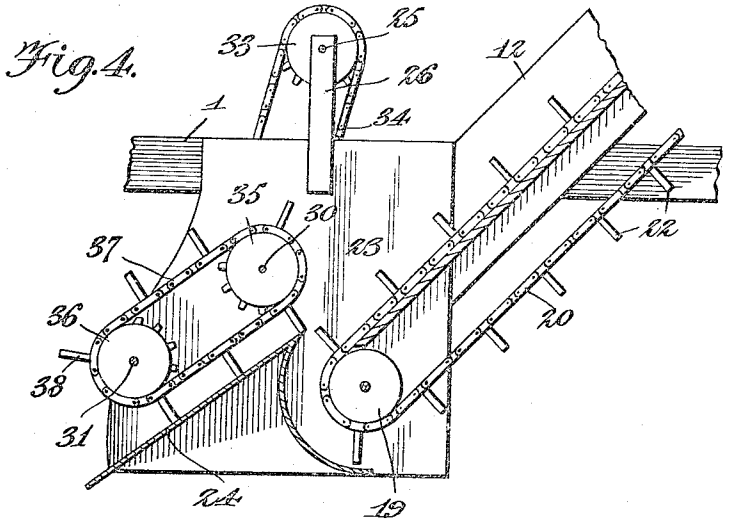


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. METZLER, OF SYRACUSE, NEW YORK, AND ROBERT METZLER, OF ODESSA, ONTARIO, CANADA.

TRENCH-DIGGER.

1,229,116. Specification of Letters Patent. Patented June 5, 1917.

Application filed April 17, 1916. Serial No. 91,798.

To all whom it may concern:

Be it known that we, WILLIAM H. METZLER, citizen of the United States, residing at Syracuse, in the county of Onondago and State of New York, and ROBERT METZLER, a subject of the King of Great Britain, residing at Odessa, in the Province of Ontario and Dominion of Canada, have invented new and useful Improvements in Trench-Diggers, of which the following is a specification.

This invention relates to trench digging machines especially adapted to be used for opening a trench in which may be laid drain tile and it consists in the novel features hereinafter described and claimed.

An object of the invention is to provide a digging machine of the character indicated which is of simple and durable structure and which may be easily and conveniently operated for opening a trench.

With the above object in view the digging machine comprises a frame mounted at its rear portion upon a traction wheel there being laterally disposed arms connected with the rear portion of the frame and wheels carried by the said arms for steadying the machine while in operation.

Curved guides are mounted at the forward portion of the frame and a supplemental frame is adjustably mounted between the said guides. An axle is pivotally connected with the supplemental frame and ground wheels are journaled for rotation at the ends of the said axle. An inclined trough is mounted upon the frame and chutes are supported upon the frame below the delivery end of the said trough. An endless belt is mounted for movement along the trough and means is provided for operating the said belt from the traction wheel. A digging share is carried by the frame and a conveyer is mounted for movement above the said share and is adapted to assist in removing the material from the share and delivering the same to the receiving end of the trough and the belt mounted for movement therein. Means is provided for operating the delivering device from the means which operate said belt.

In the accompanying drawing:—

Figure 1 is a side elevation of the digging machine.

Fig. 2 is a top plan view of the same.

Fig. 3 is a rear end elevation of the same.

Fig. 4 is a detailed vertical sectional view of an intermediate portion of the same.

Fig. 5 is a fragmentary horizontal sectional view.

The digging machine comprises a frame 1 which may be of any suitable material preferably metal. A traction wheel 2 is journaled for rotation at the rear portion of the said frame and a sprocket wheel 3 is fixed with relation to the said traction wheel and is located at the side thereof.

Curved guides 4 are mounted at the forward portion of the said frame 1 and the said guides are provided at their inner sides with teeth 5. A supplemental frame 6 is slidably mounted between the guides 4 and axle 7 is pivotally connected with the forward portion of the said supplemental frame. Ground wheels 8 are journaled for rotation at the ends of the axle 7 and are adapted to travel over the surface of the ground at the opposite sides of the ditch which is cut by the machine in a manner to be explained hereinafter. Shafts 9 are journaled for rotation upon the supplemental frame 6 and one of the said shafts is provided with a crank handle 10. Gear wheels 11 are mounted upon the shafts 9 and the said gear wheels on the opposite shafts mesh with each other at their inner portions.

The outer portions of the gear wheels 11 mesh with the teeth 5 carried by the guides 4.

It is apparent that by rotating that shaft 9 which carries the handle 10 that the intermeshing gear wheels 11 cause both of the said shafts to rotate in unison whereby the gear wheels move along the teeth 5 of the guides 4 and the forward portion of the main or primary frame 1 may be raised or lowered with relation to the forward supporting wheels 8.

A trough 12 is mounted in an inclined position at the intermediate portion of the frame 1 and a shaft 13 is journaled for rotation at the upper portion of the said trough. A sprocket wheel 14 is fixed to the shaft 13 and a sprocket chain 15 is trained around the sprocket wheels 3 and 14 and is adapted to transmit rotary movement from the wheel 2 to the shaft 13.

A shaft 16 is also journaled for rotation at the upper portion of the trough 12 and a gear wheel 17 is fixed to the shaft 16 and meshes with a gear wheel 18 fixed to the shaft 13, consequently it will be seen that

the shaft 16 is rotated in the opposite direction from that in which the shaft 13 rotates when the machine is in operation. A roller 19 is journaled for rotation at the lower end of the trough 12 and a chain belt or a canvas belt 20 is trained around the roller 19 and the shaft 16. Inclined chutes 21 are supported by the frame 1 below the delivery end of the belt and below the upper end of the trough 12. Suitable cross slats 22 are mounted upon the belt 20. Fender plates 23 depend from the intermediate portion of the frame 1 and are located at the opposite ends of the roller 19. A digging share 24 is located between the fender plates 23 and is upwardly and rearwardly inclined. The forward edge portion of the share 24 projects beyond the forward edges of the plates 23 and below the lower edges thereof as best shown in Fig. 1 of the drawing.

A shaft 25 is journaled for rotation in standards 26 mounted at the intermediate portion of the frame 1 and a sprocket wheel 27 is mounted upon the said shaft 25. A sprocket wheel 28 is mounted upon the shaft 13 and a chain or belt 29 is trained around the sprocket wheels 27 and 28 and is adapted to transmit rotary movement from the shaft 13 to the shaft 25. Spaced shafts 30 and 31 are journaled for rotation between the fender plates 23 the shaft 30 being located at a higher elevation than the shaft 31 and both of the said shafts being located above the upper surface of the shaft 24. A sprocket wheel 32 is mounted upon the shaft 30 and a sprocket wheel 33 is mounted upon the shaft 25. A sprocket chain 34 is trained around the sprocket wheels 32 and 33 and is adapted to transmit rotary movement from the shaft 25 to the shaft 30. Sprocket wheels 35 and 36 are mounted upon the shafts 30 and 31 respectively and sprocket chains 37 are trained around the sprocket wheels 35 and 36. The chains 37 carry cross slats 38 which are adapted to move along the upper surface of the share 24 when the machine is in operation. A cross arm 39 is attached to the rear portion of the frame 1 and carries at its ends vertically disposed sleeves 40. Rods 41 are adjustably secured in the sleeves 40 by means of set screws or other suitable securing devices and wheels 42 are journaled for rotation at the lower ends of the said rods 41.

When the machine is in operation the shaft 24 opens a furrow in the ground and the material which is removed from the furrow is carried up by the slats 38 and deposited upon the lower end of the belt 20. The said material is then carried by the upper run of the said belt along the trough 12 and deposited upon the chutes 21 from which it may gravitate to the ground beyond the side edges of the ditch. While the share 24 is cutting the lower portion of the ditch the fender plates 23 will form the side walls of the ditch. It is apparent that by raising or lowering the wheels 8 with relation to the forward portion of the frame 1 that a ditch of any desired depth may be cut. An operator's seat 43 is mounted upon the upper portion of the trough 12 and may be occupied by the driver who is controlling the draft animals by means of which the machine is drawn. As the machine moves along the ditch the wheels 42 travel along the surface of the ground at the rear portion of the frame and steady the rear part of the frame so that the traction wheel 2 will have proper frictional contact or traction with the bottom of the furrow which is opened by the share 24.

From the foregoing description taken in conjunction with the accompanying drawing, it will be seen that a ditching machine of simple and durable structure is provided and that the same may be easily and conveniently used for opening a ditch in the ground preparatory for laying drain tile or the like.

Having described the invention what is claimed is:—

A ditching machine comprising a frame, wheels supporting the frame, curved guides mounted at the forward portion of the frame, a supplemental frame movably mounted between the guides, shafts journaled upon the supplemental frame, intermeshing gear wheels carried by the shafts and meshing with the guides, a wheel supported axle pivotally connected with the supplemental frame, a digging share carried by the frame, a belt mounted for movement behind the digging share, and means for driving the belt from one of the supporting wheels of the frame.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. METZLER.
ROBERT METZLER.

Witnesses to the signature of W. H. Metzler:

E. D. Roe, Jr.,
Louis Lindsey.

Witnesses to the signature of Robert Metzler:

John Schermerhorn,
Orange Babcock.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."