

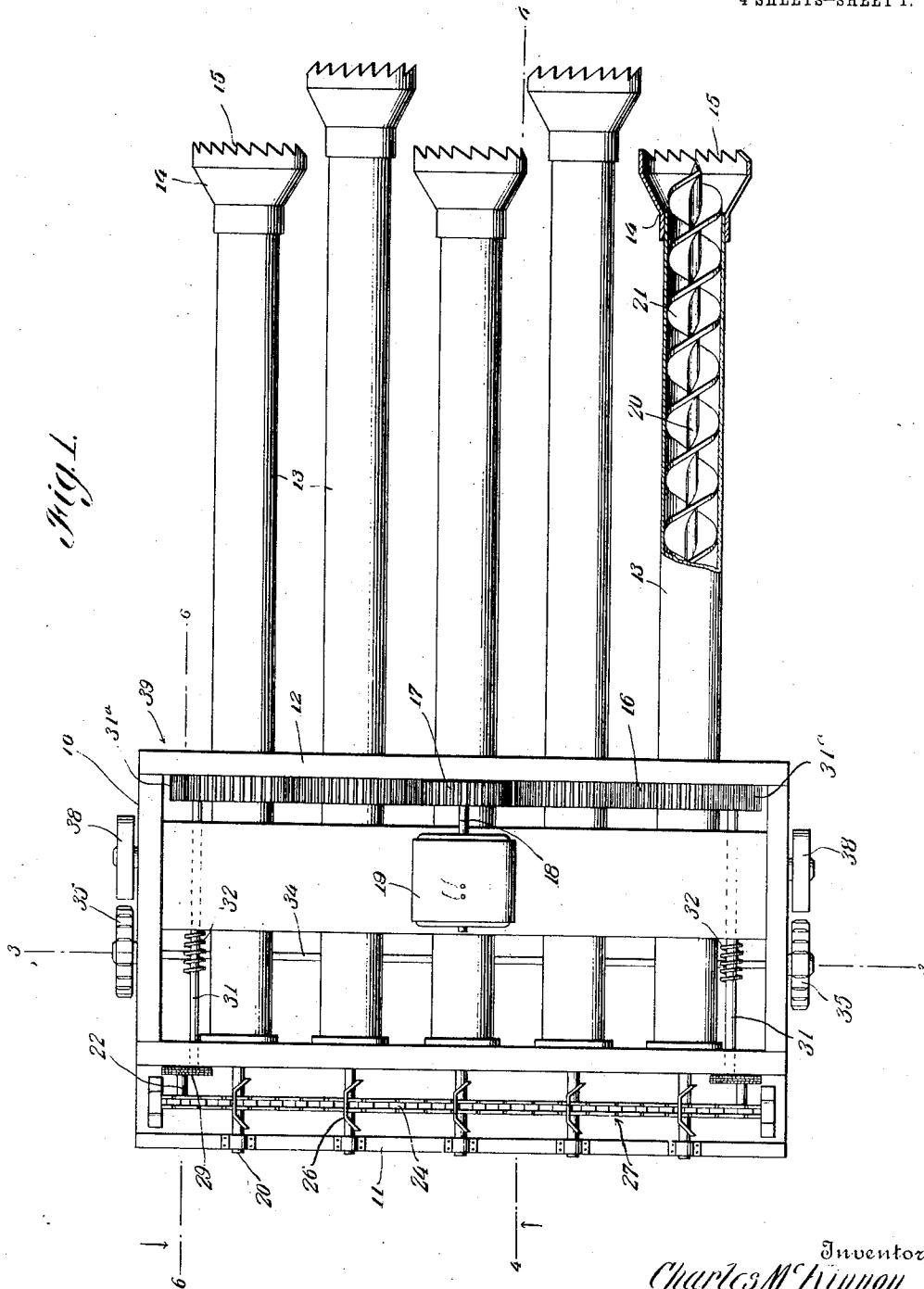
C. McKINNON.
MINING MACHINE.

APPLICATION FILED JULY 8, 1911.

1,059,188.

Patented Apr. 15, 1913.

4 SHEETS—SHEET 1.



Witnesses

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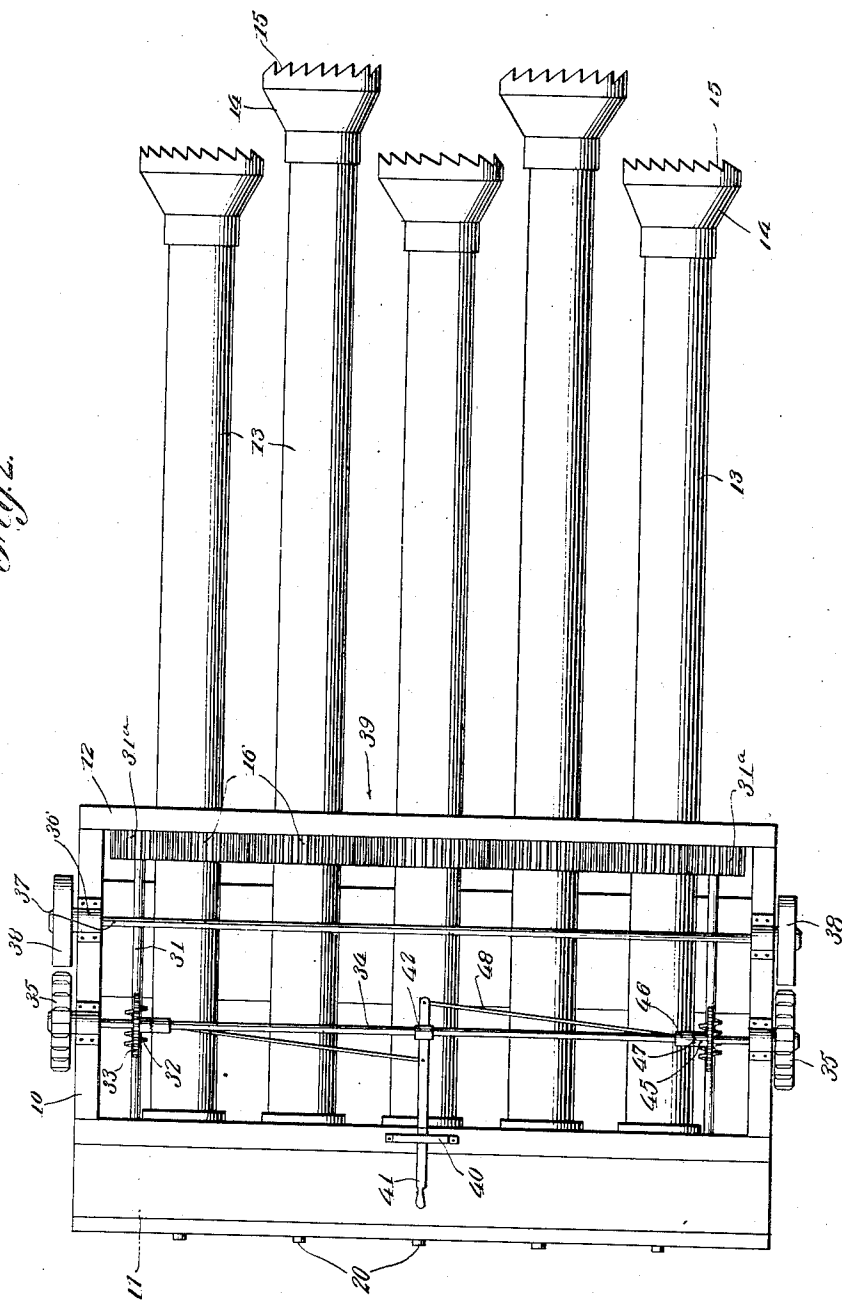
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

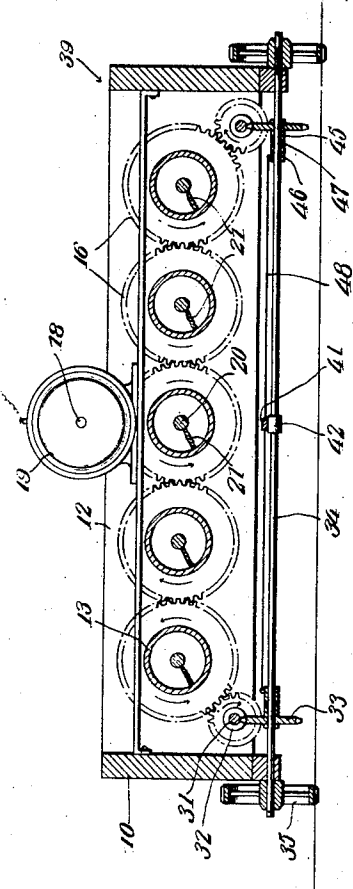


Fig. 4.

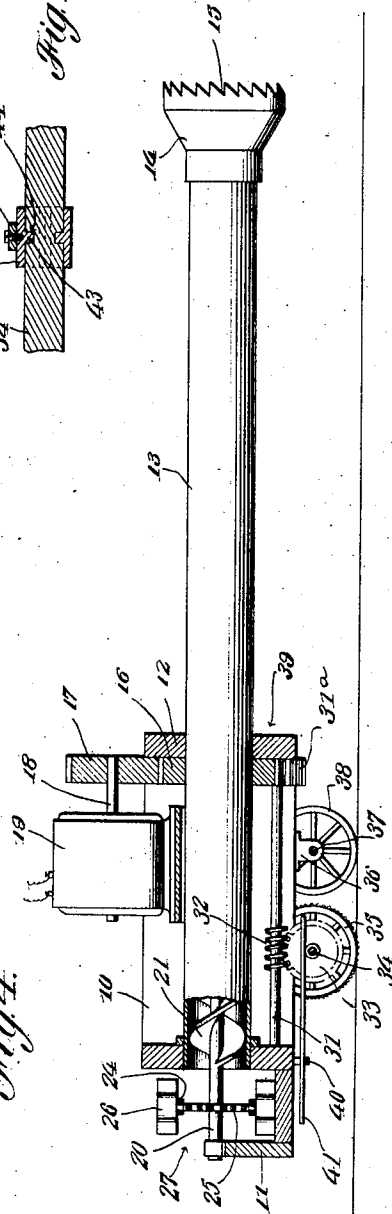
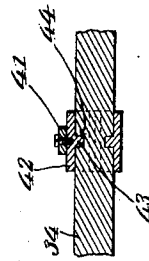


Fig. 7.



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4 SHEETS—SHEET 4.

Fig. 5.

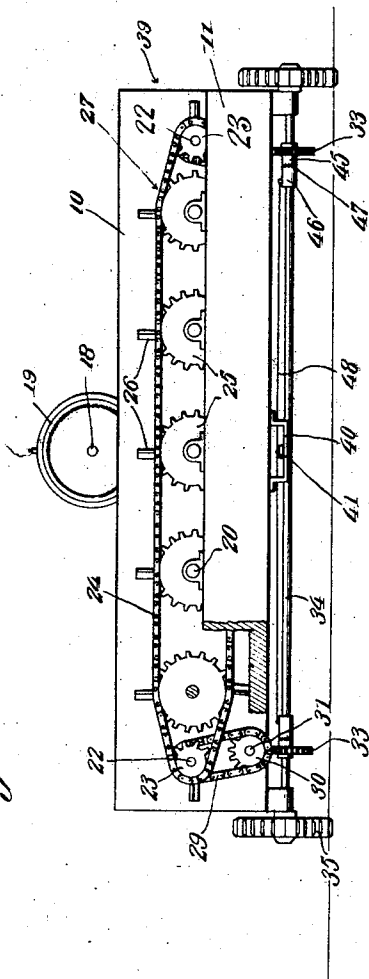
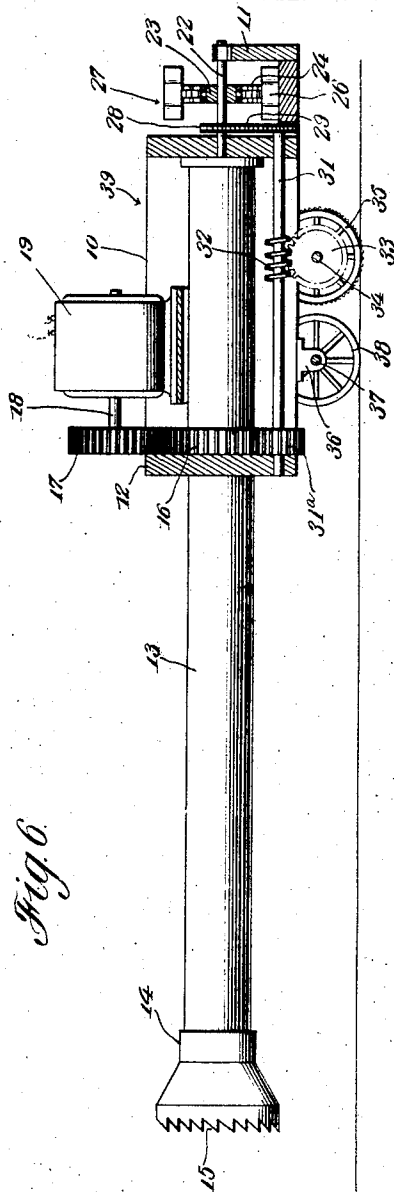


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MINING-MACHINE.

1,059,188.

Specification of Letters Patent.

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Application filed July 8, 1911. Serial No. 637,442.

To all whom it may concern:

Be it known that I, CHARLES McKINNON, a citizen of the United States, residing at Mindenmines, in the county of Barton and State of Missouri, have invented new and useful Improvements in Mining-Machines, of which the following is a specification.

The invention relates to excavating, more particularly to mining systems and has for an object to provide a device for mining ores, such as coal and the like.

Among other features my device embodies a structure adapted to rotatably perform the work of undercutting, means for removing the products of undercutting from the point of undercutting to a place of convenient conveyance and means for propelling my machine to advance the process of undercutting.

To accomplish the desired result, use is made of a carriage, a series of rotary cutters for cutting the ore, conveying means for conveying the ore from the point of cutting to a convenient place of disposal and driving means for propelling the carriage to advance the same in the mine, the said driving means being adapted to operate the rotary cutters and the mentioned conveying means.

Reference is to be had to the accompanying drawings constituting a part of this specification, in which similar characters of reference denote corresponding parts in all the views and in which—

Figure 1 is a plan view of my mining machine, parts being broken away to disclose the underlying structure. Fig. 2 is a bottom plan view of my machine showing the clutch mechanism. Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1, looking in the direction of the arrow. Fig. 4 is a vertical longitudinal sectional view taken on the line 4—4 in Fig. 1, looking in the direction of the arrow. Fig. 5 is an end view of my machine, parts being broken away to disclose the underlying structure. Fig. 6 is a vertical sectional view taken on the line 6—6 in Fig. 1, looking in the direction of the arrow. Fig. 7 is a fragmentary vertical sectional view showing the manner of mounting the lever for controlling the clutch mechanism.

Referring more particularly to the views, I provide a frame 10 terminating at the rear end in a trough 11, the forward part of the frame 10 being provided with a cross mem-

ber 12 and journaled on the frame 10 and revolubly extending through the cross member 12 are a plurality of spaced rotatable tubes 13 having secured to their outer ends circular flared cutting heads 14 provided with peripherally extending teeth 15. Keyed to the tubes 13 are intermeshing toothed wheels 16, one of the toothed wheels being mounted to mesh with the toothed wheel 17 keyed to a shank 18 of a motor 19 mounted on the frame 10.

Journaled on the frame 10 and extending longitudinally through the tubes 13 are a plurality of shafts 20 having spiral conveyers 21 secured thereon, the said conveyers being extended through each of the tubes 13 from one end to the other thereof and rotatable relatively to the tube. Journaled on the frame 10 at both ends of the trough 11 are auxiliary shafts 22 and keyed thereto are toothed wheels 23 having an endless chain 24 adapted to operate over the same, the said chain being adapted to pass over toothed wheels 25 keyed to the shafts 20 having the spiral conveyers 21 thereon, suitable conveyer plates 26 being secured to the chain 24 to constitute a belt conveyer 27, the chain 24 being so positioned relatively to the trough 11 that the conveyer plates 26 will operate to pass through the trough when the chain is placed in motion.

Keyed to the auxiliary shafts 20 are toothed wheels 28 having chains 29 passed thereover, the said chains being adapted to pass over toothed wheels 30 keyed to shafts 31 journaled on the frame 10 and provided with worms 32 in engagement with toothed wheels 33 keyed to a shaft 34 having traction wheels 35 secured to the outer ends thereof, the outer ends of the shafts 31 having keyed thereto toothed wheels 31* in mesh with the outer toothed wheels being thus positioned for a purpose that will be hereinafter more fully disclosed. Bearings 36 are secured to the under side of the frame 10 and journaled therein are axles 37 having wheels 38 keyed to the outer ends thereof, the said wheels being spaced from the traction wheels 35 and the mentioned wheels 38, together with the traction wheels 35 are adapted to support the frame 10, which may now be more conveniently termed a carriage 39.

Secured to the under side of the carriage 39 is a hanger 40 through which is slidably extended a clutch lever 41, the inner end of

the clutch lever being pivotally mounted on a sleeve 42 provided with an integral circular flange 43 extending from the inner periphery of the collar, the said flange being operable in a groove 44 formed in the shaft 34 as shown more particularly in Fig. 7. With this construction the lever 41 will be prevented from turning with the shaft, while at the same time the said lever will be prevented from sliding longitudinally on the shaft. Formed on the inner sides of the toothed wheels 33 are toothed collars 45 adapted to mesh with toothed collars 46 slidably mounted on the shaft 34, the toothed collars 45 and 46 being adapted to constitute clutch members 47. Connected to the toothed collars 46 of the clutch members 47 are rods 48 having connection with the lever 41 so that when the lever 41 is operated, the toothed collar 46 can be either engaged or disengaged with the toothed collars 45.

Before proceeding to a description of the operation of my machine, it will be well to state that when the motor 19 is operated, the connection between the motor 19 and the toothed wheels 16 will impart a rotary movement to the tubes 13, the toothed wheels 31^a being keyed to the shafts 31, having connection with the chain 24 through the medium of the toothed wheels 28 and 29 and the shafts 20 will cause the chain 24 to operate and as the chain 24 is engaged with the toothed wheels 25 keyed to the shafts 20, the spiral conveyers 21 will be operated within the tubes 13, while the conveyer plates 26 movable with the chain 24 will pass through the trough 11, the worms 32 in engagement with the wheels 33 being adapted to rotate the traction wheels 35 inasmuch as the worms 32 will operate with the shafts 31 to which they are keyed.

Assuming that my machine is to be used in connection with coal mining, the carriage, together with all the parts mounted thereon is positioned in the coal mine with the cutting heads 14 abutting against the face of the mine that is to be cut. The motor 19 is now operated and as mentioned heretofore, the connection between the motor 19 and the intermeshing wheels 16 will cause the tubes 13 to revolve, thus revolving the cutting heads 14 so that the teeth 15 will cut into the face of the mine thus cutting the coal, it being understood that adjacent cutting heads 14 operate in opposite directions in view of the fact that the adjacent toothed wheels 16 are in mesh, thus rotating the adjacent tubes 13 in opposite directions. The toothed wheels 31^a, in mesh with the outer toothed wheels 16 and keyed to the shafts 31 will cause the chain 24 to operate in view of the connection between the chain 24 and the toothed wheels 30 keyed to the shafts 31 and as the chain 24 operates over the toothed wheels 25 keyed to the shafts 20, the spiral

conveyers 21 in the tubes 13 will rotate so that the coal, cut by the cutting heads 14 will be received by the conveyers 21 and carried to the inner ends of the tubes 13, from which cut coal will be dumped into the trough 11. Now as the chain 24 operating as heretofore mentioned, has the conveyer plates 26 secured thereto and operable in the trough 11, the mentioned plates as they pass through the trough 11 will push the coal received in the trough, toward one end thereof and the coal will thus be ejected from that end of the trough. As the shafts 31, having the toothed wheels 31^a keyed thereto and in mesh with the outer toothed wheels 16, are rotated, the worms 32 will be rotated and the said worms being in mesh with the toothed wheels 33, will impart a rotative movement to the traction wheels 35, thus advancing the carriage 39 farther into the mine as the cutting heads 14 cut the coal from the face of the mine. If it is desired to retain the carriage 39 in a stationary position, the lever 41 is operated to disengage the toothed collars 46 from the toothed collars 45, the mentioned toothed collars 45 and 46 constituting the clutch members 47 as has been heretofore mentioned and when this operation has been performed, it will be seen that there will be no operative connection between the shaft 34 and the driving mechanism on the carriage, thus causing the traction wheels 35 to assume a stationary position.

From the foregoing description, it will be seen that I not only provide a machine for cutting the ore, the cutting means being automatically fed into the ore, but I also provide a structure for conveying the cut product to a convenient place of disposal, the mentioned means being operable in conjunction with the means for advancing the carriage in the mine and the means for cutting the ore.

Having thus fully described the invention, what I claim as new, is:—

1. In a mining machine the combination of a carriage, a plurality of tubes revolubly mounted on the carriage, cutting heads secured to the said tubes and operable therewith, spiral conveyers mounted within the said tubes, a trough formed at one end of the said carriage, a conveyer mounted to operate in the said trough, a connection between the said conveyer and the said spiral conveyers for operating the said conveyer when the said spiral conveyers are operated, a second connection between the said spiral conveyers and the said tubes for operating the said spiral conveyers when the said tubes are operated and driving means for imparting a rotating movement to the said tubes.

2. In a mining machine the combination of a carriage, a plurality of tubes revolubly mounted on the carriage, cutting heads se-

cured to the said tubes and operable therewith, spiral conveyers mounted within the said tubes, a trough formed at one end of the said carriage, a conveyer mounted to operate in the said trough, a connection between the said conveyer and the said spiral conveyers for operating the said conveyer when the said spiral conveyers are operated, a second connection between the said spiral conveyers and the said tubes for operating the said spiral conveyers when the said tubes are operated, means for advancing the said carriage when the said tubes are operated and driving means for imparting a rotating movement to the said tubes.

3. In a mining machine, the combination with a carriage, of a plurality of tubes revolvably mounted on the carriage, spiral conveyers mounted within the said tubes, a trough at one end of the said carriage, a chain mounted to operate in the said trough, spaced plates secured to the said chain and operable therewith through the said trough, a connection between the said chain and the said spiral conveyers for operating the said chain when the spiral conveyers are operated, a second connection between the said spiral conveyers and the said tubes for operating the said spiral conveyers when the said tubes are operated, and driving means for imparting rotation to the said tubes.

4. In a mining machine, the combination with a carriage, of a plurality of tubes rev-

olvably mounted thereon, conveyers mounted within the said tubes, a trough at one end of the said carriage, a second conveyer mounted in the said trough, means connecting the first conveyers with the second conveyer for operating the second conveyer when the first conveyers are operated, means connecting the first conveyers and the said tubes for operating the said first conveyers when the tubes are operated, and driving means for imparting rotation to the said tubes.

5. In a mining machine, the combination with a carriage of a plurality of tubes revolvably mounted thereon, cutting heads on the said tubes and operable therewith, spiral conveyers journaled within the said tubes, a trough at one end of the said carriage, a conveyer mounted to operate in the said trough, means connecting the said conveyer and the said spiral conveyers for simultaneously operating the same, means connecting the said spiral conveyers and the said tubes for simultaneously operating the same, means for advancing the said carriage when the said tubes are operated, and driving means for imparting rotation to the said tubes.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES McKINNON.

Witnesses:

WILLIAM McKINNON,
C. C. FLACK.