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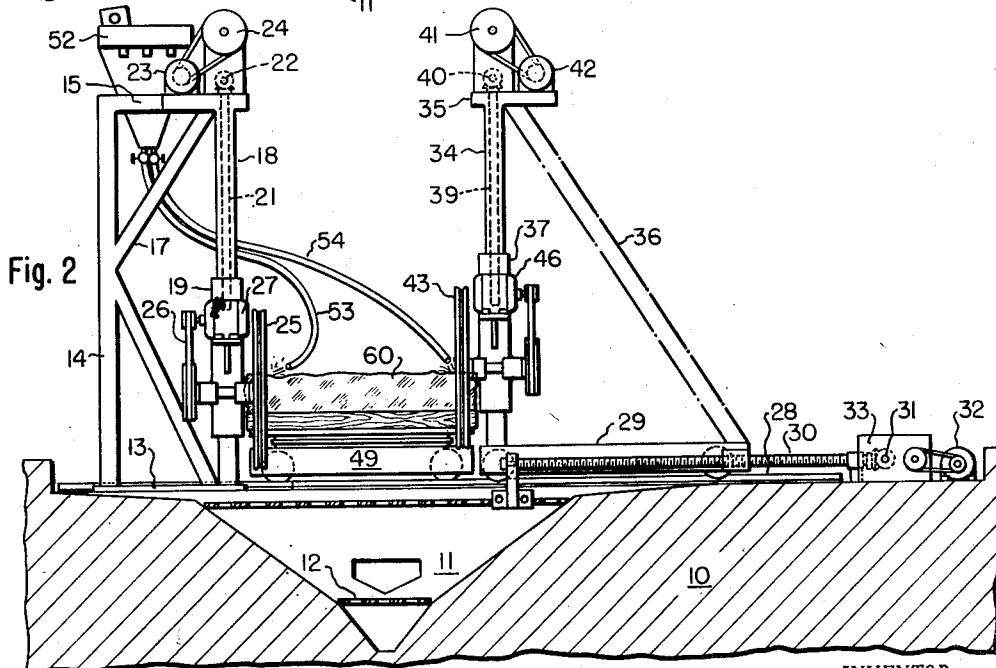
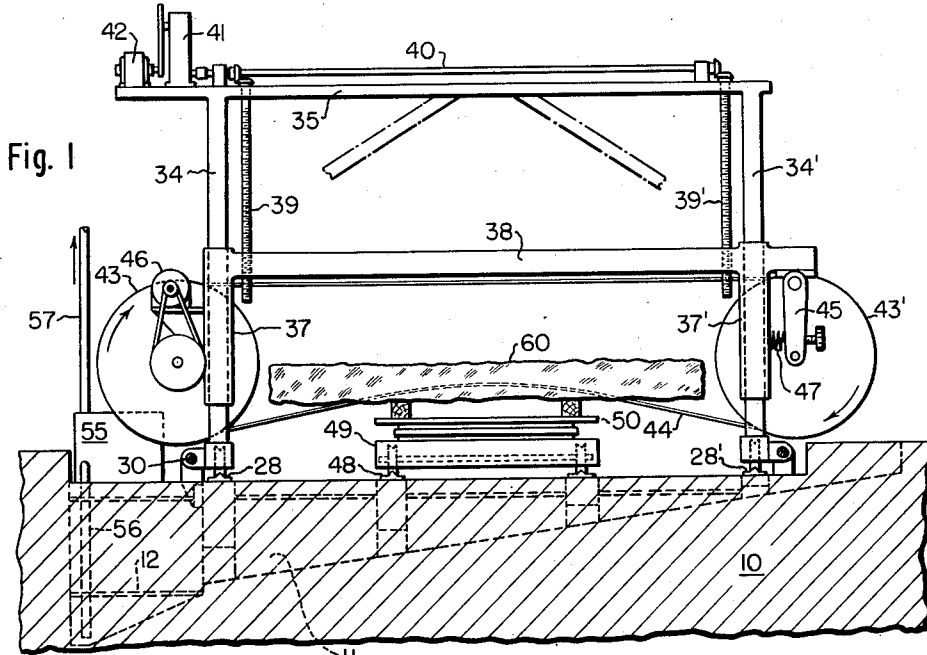
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2,795,222

WIRE STONE SAWING MACHINE

Filed Nov. 18, 1955

2 Sheets-Sheet 1



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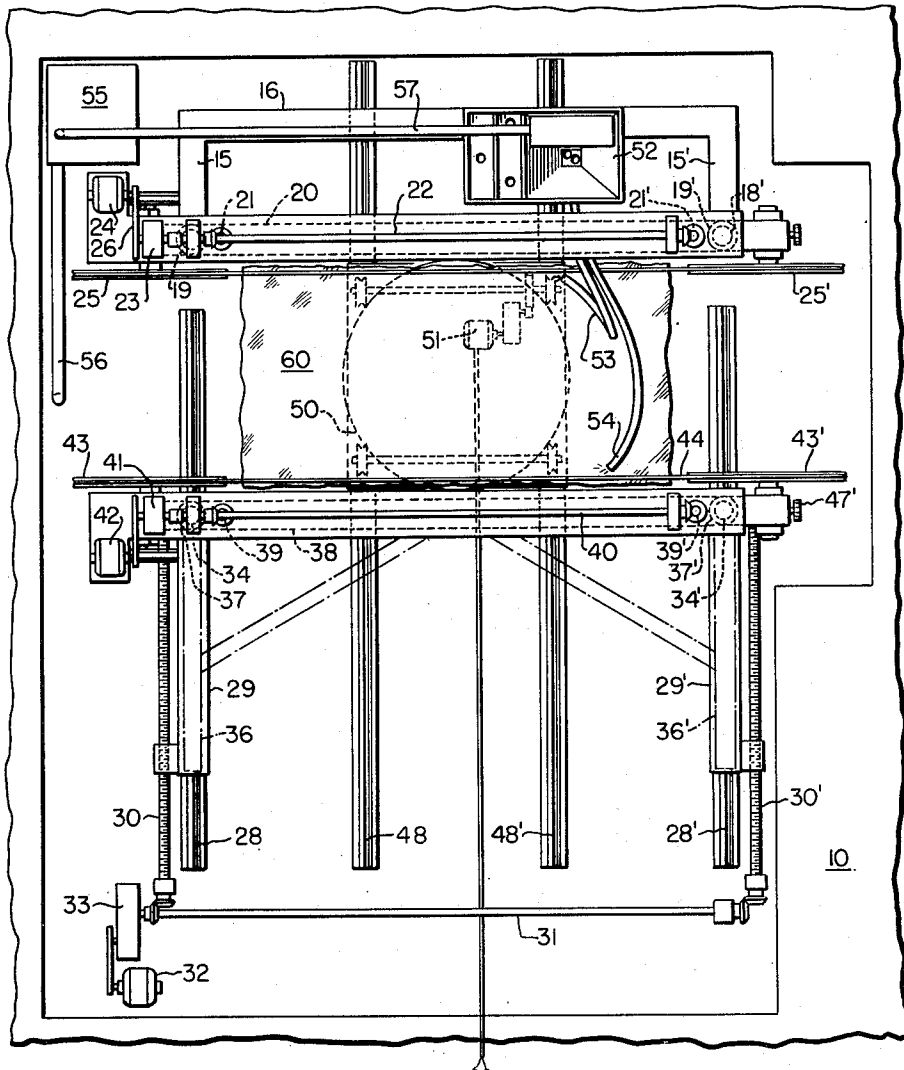
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Fig. 3



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## WIRE STONE SAWING MACHINE

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6 Claims. (Cl. 125—21)

This invention comprises a new and improved stone sawing machine having greater capacity and a wider range of adjustment than machines of this type heretofore available to the industry.

Machines as heretofore constructed have included a pair of stationary side frames supporting a transverse shaft having a pair of wire carrying sheaves as part of a system for guiding and driving two wires in parallel cutting paths. This construction, besides limiting the capacity of the machine, provides only a very inconvenient means for adjusting the sawing wires in locating their lines of cutting. Not only must the sheaves be loosened and shifted on the shaft, but all the guide sheaves throughout the whole length of each wire must be separately and correspondingly adjusted.

The machine of the present invention is so constructed and arranged as to obviate the difficulty in adjustment above mentioned and to provide for an extremely wide range in the setting of the wire saws, for example, from a minimum spacing of about 2" up to a maximum spacing of as much as 8 or 9'.

The machine of this invention as herein shown has as its characteristic features a common foundation supporting two complementary and cooperating units, each unit including an upright frame carrying a guide sheave and a cutting wire running over each sheave, one of said frames being stationary and the other being mounted on the foundation for bodily movement toward and from the stationary frame. Preferably and as herein shown, the movable frame has a bridge portion beneath which are located tracks for a car movable beneath the bridge into operative position between the two frames so as to present a stone for simultaneous parallel cuts. Each of the cutting wires may be carried by sheaves on the bridge member of the unit, or they may be guided in a more extended path to and from points remote from the unit.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings in which:

Fig. 1 is a view of the machine in side elevation,

Fig. 2 is a corresponding view in front elevation, and

Fig. 3 is a plan view.

The machine is installed upon a concrete bed or a foundation 10 in which is formed a pit 11 for the reception of the cutting fluid. The pit is formed with a sump having a covering grating 12 and from which the fluid is recirculated to the cutting wires. At the left hand side of the pit and upon the foundation 10, as shown in Fig. 2, is erected a stationary frame comprising a base 13 from which projects a pair of upright beams 14 connected at the top by a stationary bridge comprising inwardly extending arms 15, 15' and a cross beam 16. The upright beams are supported by a system of diagonal braces 17. The stationary frame includes a post 18 at each side upon which a sleeve 19 is mounted for vertical slid-

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ing movement. The sleeves are connected by a horizontal bridge 20 suspended from the cross beam by a pair of vertical screws 21. These screws are provided at their upper ends with bevel gears meshing with corresponding gears on a cross shaft 22 mounted in bearings projecting upwardly from the bridge 20. The cross shaft 22 is arranged to be driven through a reducing gear 23 by a motor 24, the construction being such that the bridge 20 is moved up and down by operation of the motor 24.

Each of the sleeves 19 and 19' is provided with bearings for a countershaft carrying a grooved sheave 25 over which runs one of the saw wires. The sheave on the sleeve 19 is driven by a motor 27 through a belt 26 and pulley shown in Fig. 2. The wire, in turn, drives the sheave 25'. The whole bridge assembly is lifted to an elevated initial position and then fed downwardly by action of the motor 24 at a predetermined rate suitable for the sawing operation upon the stone at hand.

The foundation includes concrete trestles carrying a pair of parallel tracks 28, 28', as shown in Fig. 3, and upon each of these tracks is mounted a wheeled truck 29, 29' carrying between them the movable unit of the machine. To an outwardly projecting nut on each of the trucks is connected a lead screw 30, 30' provided at its outer end with a bevel gear meshing with corresponding bevel gears on a cross shaft 31 and driven by a motor 32 through a reduction gear 33. The lead screws 30, 30' are journaled at their inner ends in hangers fast to the tracks and have threaded connection with the outer ends of the trucks, being located entirely below the top of the trucks. It will be seen that by action of the motor 32 both trucks of the right hand unit as shown in Fig. 2 may be simultaneously moved in and out, that is to say, moved bodily toward or away from the stationary unit of the machine. The fact that the motor 32 is geared to both trucks insures their simultaneous movement and maintains the cutting wire of the movable unit always parallel to that of the fixed unit.

From each of the tracks projects a vertical post 34, 34' similar in construction to the posts 18 and like them having a transverse connecting overhead beam 35. The beam 35 is supported by inclined braces 36 leading from the outer ends of the trucks 29, 29'. Upon each of the posts 34, 34' is mounted a sleeve 37, 37' and these are connected by a transverse bridge 38 as best shown in Fig. 1. The bridge 38 is suspended from the overhead beam 35 by a pair of vertical screws 39, 39' having bevel gears at their upper ends meshing with bevel gears on a cross shaft 40 journaled in bearings projecting from the cross beam 35. The cross shaft 40 is driven through a gear reduction 41 by a motor 42 carried at the left hand end of the beam 35. Through these connections the motor 42 operates to raise and lower the bridge 38, the sleeves 37, 37' and all parts carried thereby.

The left hand sleeve 37 is provided with bearings for a short countershaft carrying at one end a sheave 43 and at the other a pulley belt-driven from a motor 46 mounted in a bracket projecting from the sleeve 37. An endless wire saw 44 runs over the sheave 43 and a corresponding sheave 43' at the other side of the bridge assemble. The sheave 43' is adjustable to regulate the tension of the wire 44 and to that end its shaft is journaled in the lower end of an arm 45 depending from the right end of the bridge 38. The arm 45 is pivoted to swing outwardly under the action of a compression spring 47 and limited in its movement by a screw 47' threaded into the sleeve 37'. By this means the wire 44 is maintained always under the desired operating tension and the sheave 43' is, of course, driven by the wire.

It will be apparent from the description up to this point that the right hand unit of the machine is bodily

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movable together with its power operated means for driving the wire 44 and its power operated means for lifting and lowering the bridge assembly that carries the wire. The tracks 28, 28' support this unit and permit its sheaves 43 and 43' to be brought up into close proximity to the sheaves 25, 25' of the stationary unit or be spaced away from them by a distance of as much as 8 feet or more.

Between the tracks 28, 28' is located a second pair of parallel tracks 48, 48' that extend under the bridge 38 and support a wheeled car 49 having a rotatable turn table 50 for supporting the stone 60 to be operated upon. The car is operated by a motor 51 and may be conveniently loaded in a position at the outer ends of the tracks 48, 48' and then propelled inwardly carrying the stone beneath the bridge 38 into the desired operating position above the pit 11. After two parallel cuts have been made with stone in its initial position it may be revolved 90° and two more cuts made thus reducing the stone to a rectangular block or slab.

A hopper or reservoir 52 for cutting fluid is mounted upon the cross beam 16 of the stationary unit and from this lead flexible pipes 53 and 54 which may be directed respectively to the cutting lines of the two wire saws. The cutting fluid is circulated by a pump 55 set on the foundation, pumping from the sump through a pipe 56 and delivering through a pipe 57 to the hopper 52.

As herein shown the saw wires are carried entirely by the two sheaves of their respective units but it will be understood that longer wires may be employed if desired and in that case the paths of the wires will be determined by auxiliary sheaves located at a distance behind the units.

It will be noted that the position of the cut in the slab under the wire of the stationary unit will be determined by moving the slab on the car under the wire. The second cut will be located by moving the movable unit with the wire over the slab on the car.

Having thus disclosed my invention and described in detail a preferred embodiment thereof I claim as new and desire to secure by Letters Patent:

1. A stone sawing machine including in its organization a pair of wheeled trucks mounted on transversely spaced tracks, an upright post rising from each truck, a sheave-carrying bridge vertically movable on the posts, lead screws connected to each truck and power-operated mechanism for rotating both lead screws at the same time simultaneously to advance or retract both trucks with the bridge carried by said posts.

2. A stone sawing machine comprising a common foundation having a pit therein and supporting two cooperating units, one unit being fixed at one side of the pit and the other being bodily movable above the pit, each unit carrying a sheave-guided wire, and means for

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pumping cutting fluid from the pit and flexible pipes for distributing the fluid to the cutting line of both wires in all positions of the movable unit.

3. In a stone sawing machine, a unit comprising fixed parallel tracks laterally spaced, a wheeled truck movable on each track, an upright post rising from the inner end of each truck and braced to its rear end, a sheave-carrying bridge movable on said posts, a lead screw connected to each truck, a cross shaft operatively connected to both lead screws, and power-operated mechanism for rotating the said cross shaft simultaneously to advance or retract both trucks with the bridge carried by said posts.

4. A stone sawing machine comprising a common foundation supporting two cooperating units, one of which is stationary and the other bodily movable toward and away from the stationary unit, parallel tracks on the foundation and a pair of wheeled trucks thereon carrying the movable unit, wire guiding sheaves mounted in said units for rotation about axes parallel to the tracks, a cutting wire running on the sheaves of each unit, and power driven mechanism operably geared to both the wheeled trucks for simultaneously advancing or retracting them while positively maintaining the cutting wires always in parallel relation.

5. In a wire stone sawing machine a pair of spaced parallel tracks, a wheeled truck movable on each track, a transverse sheave-carrying bridge supported at its opposite ends upon the inner portions of the trucks, a cross shaft journaled across and beyond the outer ends of the tracks, a lead screw for each truck operatively connected to the cross shaft at the outer end of the screw and to a nut on one of the trucks at an intermediate point of the screw, and means for rotating the cross shaft and the screws connected to it for simultaneously advancing or retracting both trucks with the bridge carried thereby.

6. A wire stone sawing machine as described in claim 5 in which the lead screws are located entirely below the top of the trucks and outside the tracks upon which the trucks are supported.

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