

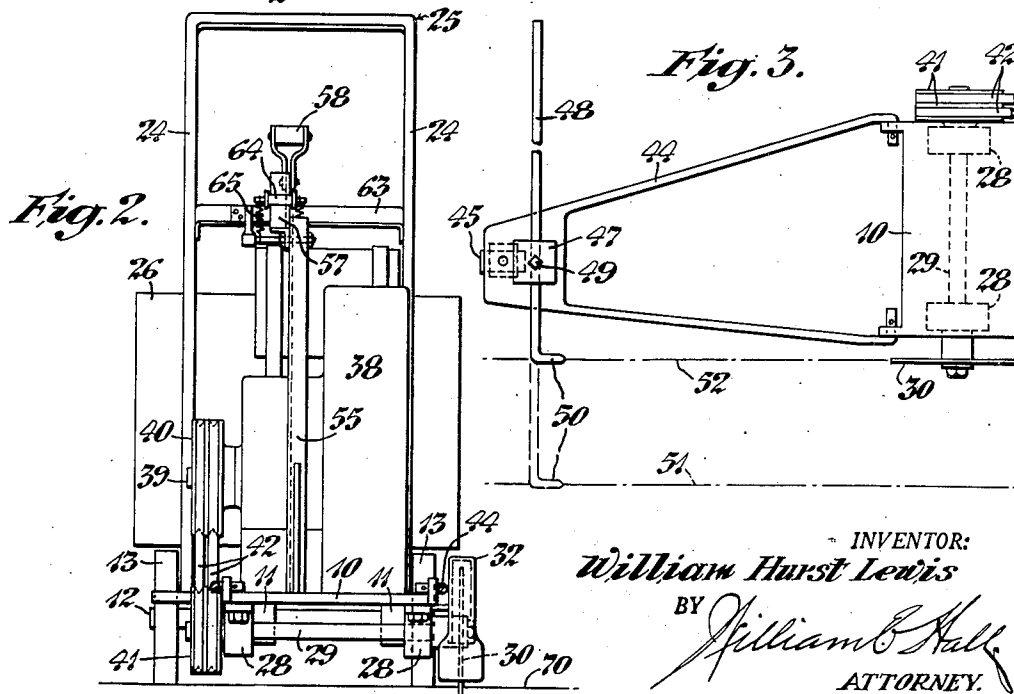
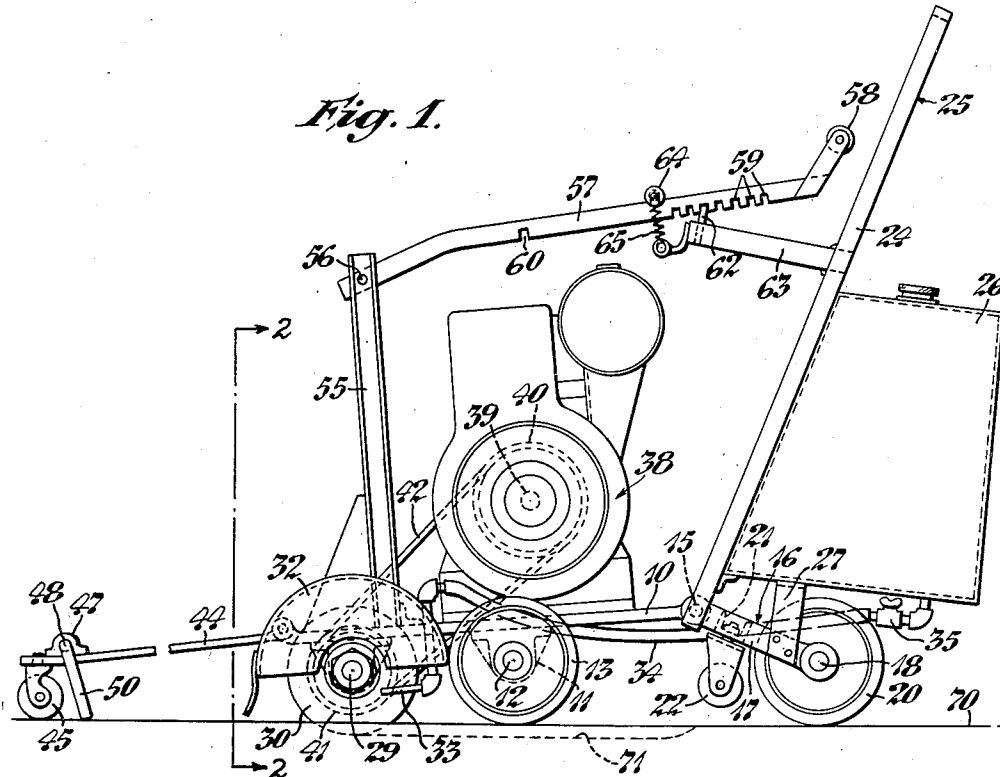
April 26, 1949.

W. H. LEWIS
COLLAPSIBLE SAW FOR CUTTING
CONCRETE AND THE LIKE

2,468,336

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

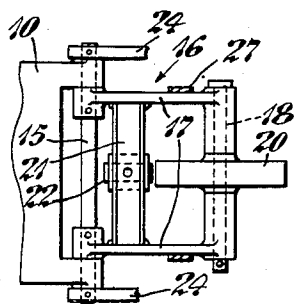
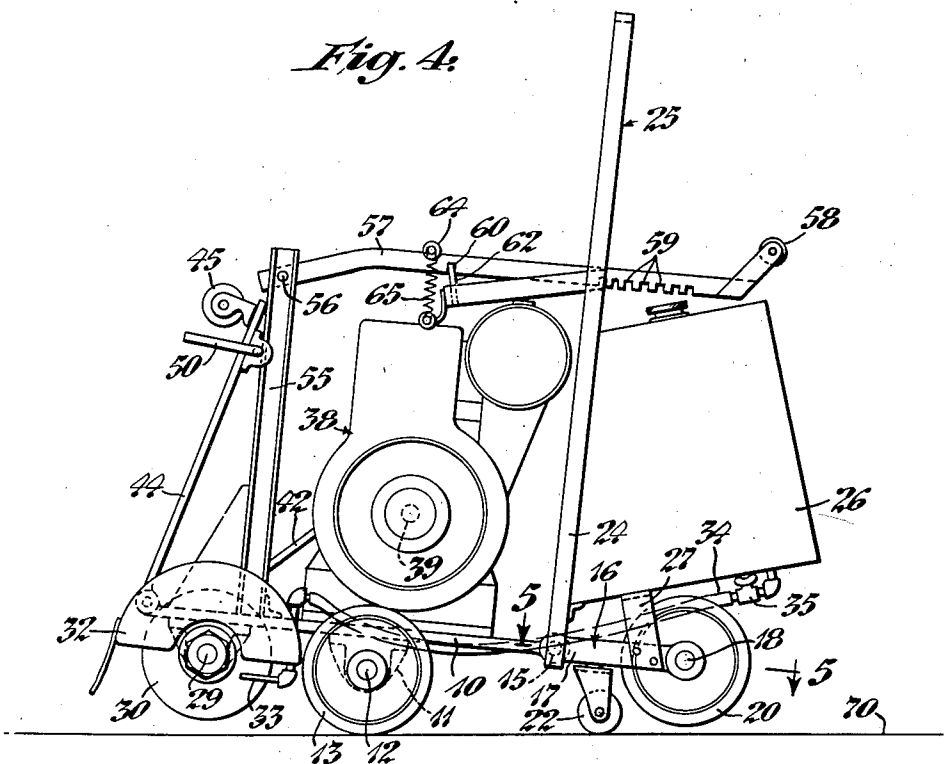


Fig. 5.

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UNITED STATES PATENT OFFICE

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COLLAPSIBLE SAW FOR CUTTING
CONCRETE AND THE LIKE

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12 Claims. (Cl. 262—20)

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This invention relates to cutting machines, and particularly to a mobile machine adapted for use in cutting concrete, asphalt, and like pavements, driveways, walkways, etc. Specifically, the invention pertains to a mobile machine adapted to cut slits or kerfs in the surface of or through slabs of concrete and the like.

One object of the invention is to provide a machine, of the character referred to, employing a rotary disc cutter element for cutting a kerf in the concrete, and having a novel means for adjusting the cutter element vertically to vary the depth of the cut made by the element.

Another object is to provide a machine of the type indicated in which the frame of the machine is pivoted on a horizontal axis to adjust the vertical position of the cutter element, which is rotatable on the frame.

Another object is to provide a machine of the type specified having a pair of main front wheels and a rear wheel, which support the machine to adapt it to be moved along the surface of the concrete in a straight line, the machine also having caster means for supporting the rear end when the cutter element is not in use, thereby permitting the machine to be moved in curved paths to facilitate locating the machine in position to commence a cutting operation.

Another object is to provide a mobile cutting machine in which the frame is constructed in two parts pivoted together to adapt the cutter element to be moved vertically into and out of engagement with the concrete to be cut and to simultaneously raise and lower the rear wheel, the pivoting of the parts of the frame being accomplished by the actuation of a manually-operable means which is adapted to be locked in various positions of adjustment.

Another object is to provide, in a machine of the class referred to, means for guiding the machine in a predetermined path during the cutting operation.

Further objects of the invention are set forth in the following specification, which describes a preferred construction of the machine, by way of example, as illustrated in the accompanying drawings. In the drawings:

Fig. 1 is a side view of the cutting machine, showing the relationship of its parts during a cutting operation;

Fig. 2 is a sectional elevational view of the same, the section being taken on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the front end of the machine;

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Fig. 4 is a view similar to Fig. 1, and showing the parts in their inoperative positions; and,

Fig. 5 is a sectional plan view of the frame pivot means, taken on line 5—5 of Fig. 4.

In the constructing of roadways, especially those made from poured concrete, it is the usual practice to provide spaced grooves in the concrete for the purpose of producing weakened places along which the concrete will crack, if at all, due to frost and other conditions. The forming of the grooves is accomplished by the use of straight-edge forms, which are removed after the poured concrete has "set" sufficiently. Such a method of forming the grooves is costly, both from the standpoint of labor involved and in the amount of necessary equipment, which must be transported to and from the construction site and serviced to maintain it in working order. It is the aim of my invention to provide a mobile machine capable of cutting such grooves or kerfs in the concrete, after the latter has set, thus expediting the building of the roadway, and eliminating special equipment heretofore deemed necessary. The cutting machine may also be used as a means for cutting concrete roadways, walkways, and floors into pieces capable of being easily removed when the concrete is to be torn up, for example, when a ditch is to be dug beneath the highway for the purpose of installing conduits, etc.

Referring to the drawings in detail, the machine comprises a main frame 10, in the form of a substantially rectangular plate. Secured to the lower surface of the frame 10 are bearing members 11 in which a transverse axle 12 is adapted to rotate, the axle carrying a pair of wheels 13 for supporting the frame above the road or other surface and permitting the machine to be propelled along the surface. The rearward end of the frame member 10 is bifurcated (Fig. 5) to provide bearings in which a transverse pivot rod 15 is rotatable. Secured to the rod 15 is an auxiliary frame 16 which includes opposite arms 17 which carry a rear axle 18 on which a rear wheel 20 is rotatable. A connecting strip 21 extending between the arms 17 supports a swivable caster wheel 22 on its lower side.

Also secured to the pivot rod 15 are the opposite side members 24 of an inverted U-shaped handle 25 which projects upwardly from the frame 16. A tank 26 is carried by the handle 25 and supported also by a bracket 27 on the frame 16, the tank being adapted to contain a supply of coolant, such as water, which is used for the purpose to be hereinafter explained.

Rotatable in bearings 28 at the forward end of the main frame 10 is a shaft 29 to which is removably secured a cutter element 30. As shown in Fig. 2, the cutter element 30 is disposed laterally outward from the left-hand wheel 13 of the vehicle so that it can be utilized to cut concrete close to a curbing, or other obstruction. A semi-circular guard 32 carried by the frame 10 encloses the upper portion of the cutter element 30. The cutter element 30 may be of any type suitable for cutting concrete, asphalt, and the like, and therefore is not herein described in detail. The coolant contained in the tank 26 is supplied to a nozzle 33 which directs a stream thereof against the cutter element 30 to cool the same and wash away the cuttings. The coolant may be conducted to the nozzle 33 by way of a flexible conduit 34 having a regulating valve 35.

The cutter element 30 is adapted to be rotated at a fast rate of speed from a source of power, such as the internal combustion engine 38 herein shown. The drive-shaft 39 of the engine carries pulley 40, which is adapted to drive smaller pulleys 41 on the shaft 29 through the medium of V-belts 42.

Guiding means are provided for guiding the vehicle in a predetermined or desired path. The guiding means consists of a U-shaped arm 44 pivoted at the forward end of the main frame 10 and projecting forwardly therefrom. At its forward end, the arm 44 carries a swiveled caster wheel 45 adapted to rest upon and roll along the surface of the concrete. The arm 44 also has a bearing 47 at its forward end in which a transverse guide-rod 48 is adjustably held by means of a set screw 49. The rod 48 has a guide-finger 50, the end of which is adapted to be maintained in close proximity with a line on the concrete along which a groove or kerf is to be cut, as shown in Fig. 3. The finger 50 may also be disposed in a previously cut groove 51 to guide the vehicle in a path parallel to said groove to form a second parallel groove 52.

Due to the pivotal connection between the main and auxiliary frame members 10 and 16, these members may be relatively pivoted in the manner illustrated in Figs. 1 and 4 to raise and lower the cutter element 30 and to raise and lower the rear wheel 20. The members 10 and 16 are relatively pivoted by means next described. Attached to and projecting upwardly from the main frame 10, forwardly of the axle 12, is a standard 55, at the upper end of which is a pin 56 on which is pivoted one end of an operating or adjusting member 57. The member 57 extends rearwardly between the sides of the U-shaped handle 25 and has a hand-grip 58 at its end. On its lower edge, the member 57 has a series of closely spaced notches 59 and a single notch 60 spaced forwardly from the series of notches 59. The notches 59 and 60 are adapted to register with and receive a detent projection 62 carried by a bracket 63 attached to the handle 25. A roller 64 is held in engagement with the upper edge of the adjusting member 57 by means of springs 65, and serves to maintain the detent projection 62 in locking engagement in the notches 59 and 60.

The mobile cutting machine operates in the following manner: To move the vehicle to a location where a cutting operation is to be performed, the parts of the machine will be adjusted to the position shown in Fig. 4. That is to say, the detent projection 62 will be engaged in the foremost notch 60 of the member 57, so that the forward end of the main frame 10 will be

elevated to dispose the cutter element 30 above and out of engagement with the surface 70 of the concrete. In this position of adjustment, the rear pivotal end of the frame 10 is lowered to cause the rear wheel 20 to be elevated above the surface 70, and the caster wheel 22 will engage the surface. The vehicle thus may be pushed along the surface 70, with front wheels 13 and the caster wheel 22 rolling upon the surface. Due to this three-wheel mounting, the vehicle may be readily steered in desired curved paths. During movement of the vehicle in this manner, the guiding means 44—50 is pivoted upwardly to the inoperative position, shown in Fig. 4.

After the vehicle has been moved to the location where a groove or kerf is to be cut, the guiding means is lowered and its finger 50, together with the cutter element 30, aligned with a line along which the groove is to be cut. Holding the handle 25 with one hand, the adjusting member 57 is raised with the other hand and moved forwardly to cause the frame 10 to be pivoted on the axle 12 in a direction to lower the cutter element 30 into engagement with the surface 70 of the concrete. With the engine 38 operating, the cutter may be lowered to an extent wherein it cuts into the concrete, the depth to which the cutter descends being determined by the setting of the adjusting member 57 with respect to the handle 25, and the parts are then locked in the adjusted position by the engagement of the projection 62 in the appropriate notch 59. It will be observed that during the lowering of the cutter element 30, the rear end of the frame 10 is raised to withdraw the caster wheel 22 from the surface 70 and place the rear wheel 20 thereagainst, as shown in Fig. 1. The vehicle then may be pushed along the roadway, by means of the handle 25, to cause its rapidly rotating cutter element 30 to cut a groove 71 in the concrete, as shown in Fig. 1.

After the kerf 71 has been cut to the required length, the adjusting member 57 is pulled rearwardly and the handle 25 simultaneously pushed forwardly until the projection 62 is disposed in the notch 60, to withdraw the cutter element 30 from the concrete and to again cause the machine to rest upon the wheels 13 and caster wheel 22 to facilitate its being moved to a new location.

While I have herein shown and described the mobile cutting machine, as embodied in a preferred form of construction, by way of example, it is to be understood that modifications may be made therein without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a mobile cutting machine for cutting kerfs in concrete, and the like, the combination of: a main frame having a transverse axle; main wheels on said axle to adapt said machine to be moved along the surface of the concrete to be cut; an auxiliary frame pivotally connected to said main frame rearwardly of said axle; a rear wheel rotatable on said auxiliary frame and adapted to roll along said surface; a caster also rotatable on said auxiliary frame; a cutter element rotatable on said main frame forwardly of said axle and adapted to cut a kerf in said concrete; power means on said main frame for rotating said cutter element; and pivoting means for relatively pivoting said main and auxiliary frames, relative pivotal movement of said frames in one direction causing the forward end of said main frame to descend to cause said cutter ele-

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ment to engage the concrete and to maintain said caster elevated above said surface, and relative pivotal movement of said frames in the opposite direction acting to raise the forward end of said main frame to dispose said cutter element above said surface, and to raise said rear wheel above said surface and engage said caster against said surface to adapt the machine to be moved along said surface while supported by said main wheels and said caster.

2. In a mobile cutting machine for cutting kerfs in concrete, and the like, the combination of: a main frame having a transverse axle; main wheels on said axle to adapt said machine to be moved along the surface of the concrete to be cut; an auxiliary frame pivotally connected to said main frame rearwardly of said axle; a rear wheel rotatable on said auxiliary frame and adapted to roll along said surface; a caster also rotatable on said auxiliary frame forwardly of said rear wheel; a cutter element rotatable on said main frame forwardly of said axle and adapted to cut a kerf in said concrete; power means on said main frame for rotating said cutter element; and pivoting means for relatively pivoting said main and auxiliary frames, relative pivotal movement of said frames in one direction causing the forward end of said main frame to descend to cause said cutter element to engage the concrete and to maintain said caster elevated above said surface, and relative pivotal movement of said frames in the opposite direction acting to raise the forward end of said main frame to dispose said cutter element above said surface and to raise said rear wheel above said surface and engage said caster against said surface to adapt the machine to be moved along said surface while supported by said main wheels and said caster.

3. In a mobile cutting machine for cutting kerfs in concrete, and the like, the combination of: a main frame having a transverse axle; main wheels on said axle to adapt said machine to be moved along the surface of the concrete to be cut; an auxiliary frame pivotally connected to said main frame rearwardly of said axle; a rear wheel rotatable on said auxiliary frame and adapted to roll along said surface; a caster also rotatable on said auxiliary frame forwardly of said rear wheel; a cutter element rotatable on said main frame forwardly of said axle and adapted to cut a kerf in said concrete; power means on said main frame for rotating said cutter element; pivoting means for relatively pivoting said main and auxiliary frames, relative pivotal movement of said frames in one direction causing the forward end of said main frame to descend to cause said cutter element to engage the concrete and to maintain said caster elevated above said surface, and relative pivotal movement of said frames in the opposite direction acting to raise the forward end of said main frame to dispose said cutter element above said surface and to raise said rear wheel above said surface and engage said caster against said surface to adapt the machine to be moved along said surface while supported by said main wheels and said caster; and means for retaining said main and auxiliary frames in different positions of relative pivotal adjustment.

4. In a mobile cutting machine for cutting kerfs in concrete, and the like, the combination of: a main frame having a transverse axle; main wheels on said axle to adapt said machine to be moved along the surface of the concrete

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to be cut; an auxiliary frame pivotally connected to said main frame rearwardly of said axle; a rear wheel rotatable on said auxiliary frame and adapted to roll along said surface; a caster also rotatable on said auxiliary frame forwardly of said rear wheel; a cutter element rotatable on said main frame forwardly of said axle and adapted to cut a kerf in said concrete; power means on said main frame for rotating said cutter element; pivoting means for relatively pivoting said main and auxiliary frames, relative pivotal movement of said frames in one direction causing the forward end of said main frame to descend to cause said cutter element to engage the concrete and to maintain said caster elevated above said surface, and relative pivotal movement of said frames in the opposite direction acting to raise the forward end of said main frame to dispose said cutter element above said surface and to raise said rear wheel above said surface and engage said caster against said surface to adapt the machine to be moved along said surface while supported by said main wheels and said caster; and manually operable detent means for retaining said pivoting means in different positions of adjustment.

5. In a mobile cutting machine for cutting kerfs in concrete, and the like, the combination of: a main frame having a transverse axle; main wheels on said axle to adapt said machine to be moved along the surface of the concrete to be cut; an auxiliary frame pivotally connected to said main frame rearwardly of said axle; a rear wheel rotatable on said auxiliary frame and adapted to roll along said surface; a caster also rotatable on said auxiliary frame forwardly of said rear wheel; a cutter element rotatable on said main frame forwardly of said axle and adapted to cut a kerf in said concrete; power means on said main frame for rotating said cutter element; pivoting means for relatively pivoting said main and auxiliary frames, relative pivotal movement of said frames in one direction causing the forward end of said main frame to descend to cause said cutter element to engage the concrete and to maintain said caster elevated above said surface, and relative pivotal movement of said frames in the opposite direction acting to raise the forward end of said main frame to dispose said cutter element above said surface and to raise said rear wheel above said surface and engage said caster against said surface to adapt the machine to be moved along said surface while supported by said main wheels and said caster; said pivoting means including handle means fixedly connected to said auxiliary frame and projecting upwardly therefrom, a stanchion fixedly connected to said main frame, an adjusting member pivoted at the upper end of said stanchion and extending rearwardly therefrom, and interengaging means on said adjusting member and said handle means for retaining the same in different positions of adjustment.

6. A cutting machine as defined in claim 5 in which said interengaging means includes a plurality of longitudinally-spaced slots in said adjusting member and a projection on said handle means engageable in any of said slots.

7. A cutting machine as defined in claim 5 in which said interengaging means includes a plurality of longitudinally-spaced slots in said adjusting member, a projection on said handle means engageable in any of said slots, and resilient means operative to retain said projection in said slots.

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8. A cutting machine as defined in claim 5 and including means for supplying a coolant to said cutter element, said coolant supplying means comprising a nozzle disposed adjacent said element and adapted to spray coolant, a tank carried by said handle means and adapted to contain a supply of coolant, and a conduit for conveying the coolant from said tank to said nozzle.

9. A cutting machine as defined in claim 1 in which said cutter element is rotatable in a plane disposed laterally outward from one of said main wheels.

10. A cutting machine as defined in claim 1 and including guiding means carried by said main frame at the forward end thereof and adapted to register with a prescribed line on the surface of said concrete to facilitate guiding said machine along said surface.

11. A cutting machine as defined in claim 1 and including a guiding frame carried by said

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main frame at the forward end thereof, and a guiding element carried by and adjustable laterally of said frame and provided with a finger adapted to register with a prescribed line on the surface of said concrete to facilitate guiding said machine along said surface.

12. A cutting machine as defined in claim 1 and including a guiding frame pivotally connected to said main frame at the forward end thereof, roller means at the forward end of said frame and rollable along the surface of said concrete, and a guiding element carried by and adjustable laterally of said frame and provided with a finger adapted to register with a prescribed line on or in a groove of said concrete to facilitate guiding said machine along said surface.

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No references cited.