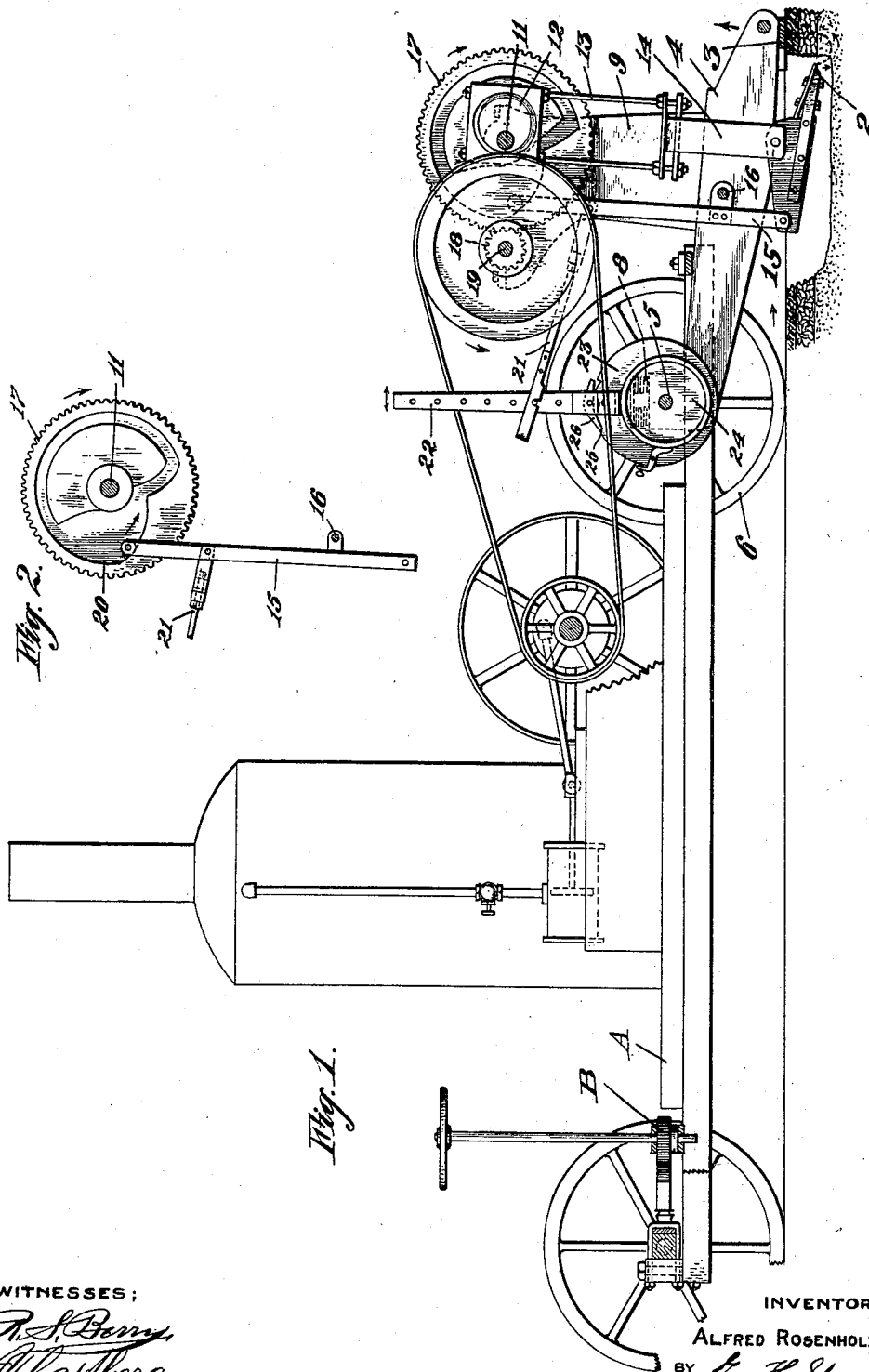


A. ROSENHOLZ.
STREET SURFACE CUTTING DEVICE.
APPLICATION FILED JUNE 29, 1909.

968,422.

Patented Aug. 23, 1910.

38 SHEETS—SHEET 1.



WITNESSES:
A. S. Berry
J. H. Berg

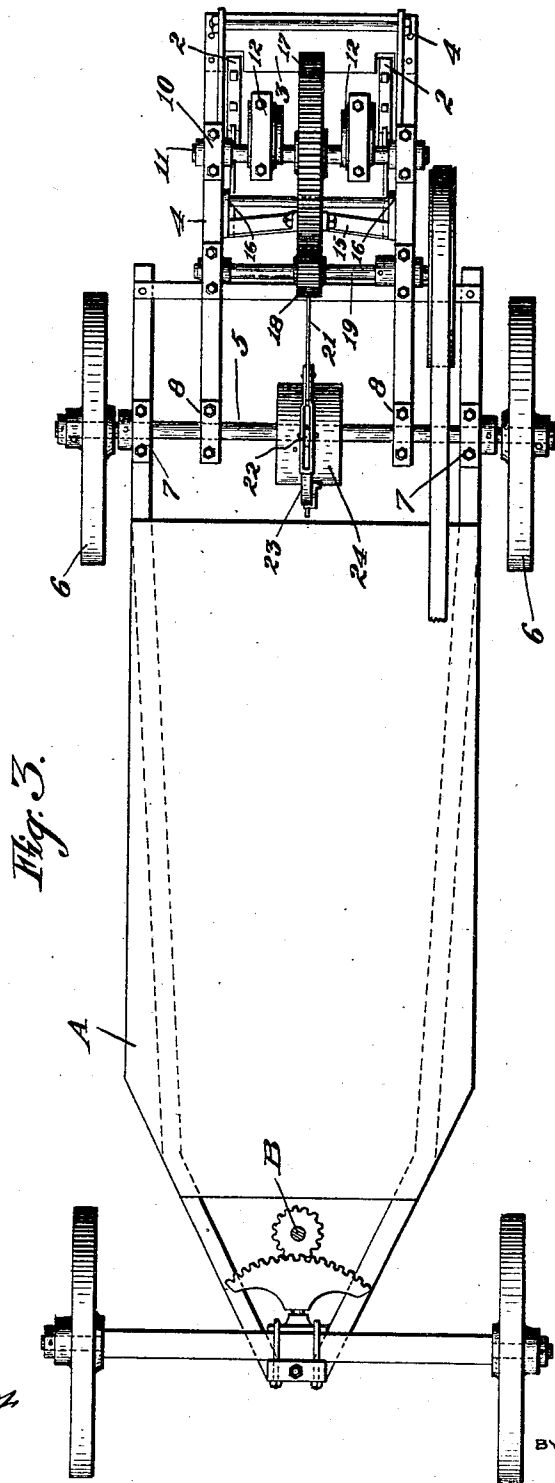
INVENTOR
ALFRED ROSENHOLZ
BY *Geo. H. Strong*
HIS ATTORNEY.

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3 SHEETS—SHEET 2.



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R. S. Berry
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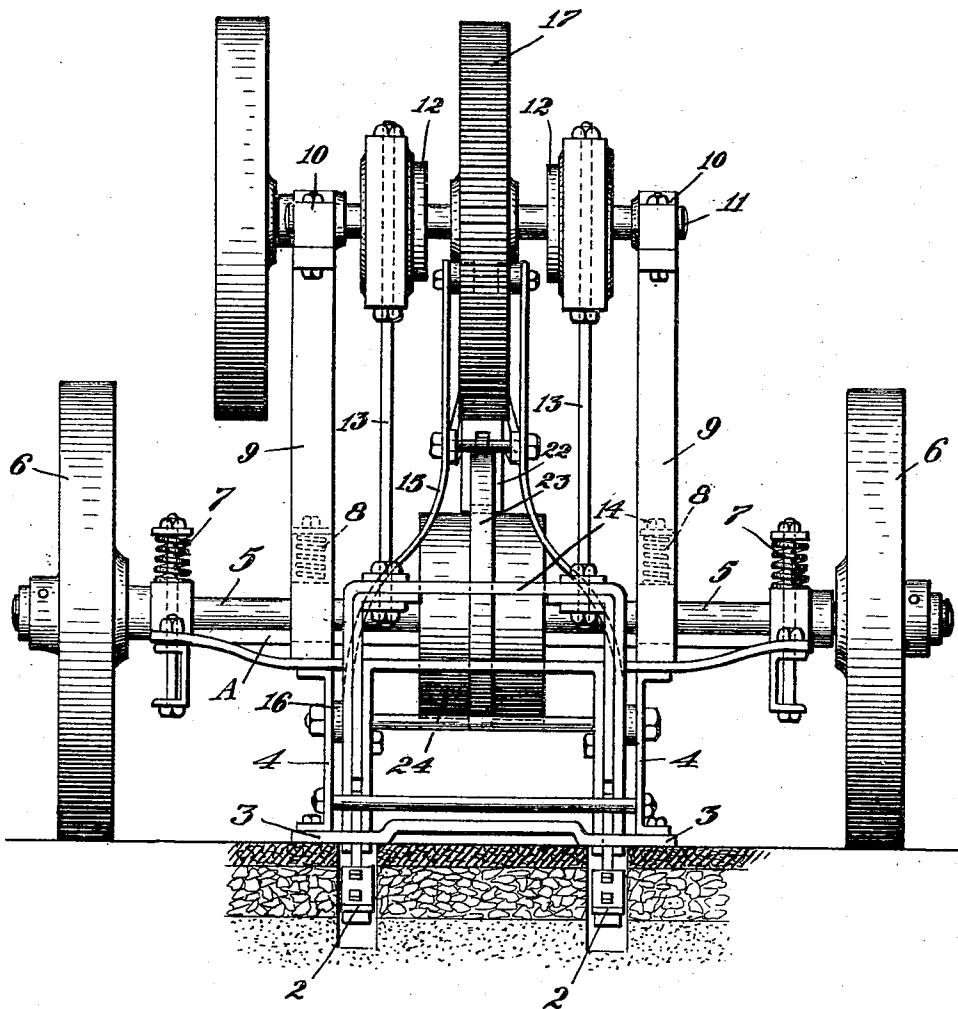
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3 SHEETS—SHEET 3.

Fig. 4.



WITNESSES;

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UNITED STATES PATENT OFFICE.

ALFRED ROSENHOLZ, OF SAN FRANCISCO, CALIFORNIA.

STREET-SURFACE-CUTTING DEVICE.

968,422.

Specification of Letters Patent.

Patented Aug. 23, 1910.

Application filed June 29, 1909. Serial No. 505,072.

To all whom it may concern:

Be it known that I, ALFRED ROSENHOLZ, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Street-Surface-Cutting Devices, of which the following is a specification.

My invention relates to a power apparatus designed for opening street or road surfaces where such are paved with asphalt and underlying concrete material, preparatory to digging necessary trenches where water, sewer, or other pipes and conduits are to be laid.

It consists in a combination of mechanism, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation with parts broken away. Fig. 2 is a detail of the slotted gear-wheel. Fig. 3 is a plan view of the invention. Fig. 4 is a front elevation.

It is the object of my invention to provide means to cut desirable lines or channels perforating the artificial surface of macadamized streets or roads so that the line of adhesive street surface between the channels cut, may be lifted out intact in blocks, in such manner that they can in many instances be easily restored after the sub surface work has been completed.

For convenience in operation I have shown my apparatus resting on the street, with the end of its underlying bases mounted to one end of a wheeled truck or vehicle A, having a suitable guiding mechanism B, and means for motive power for the machine which is automatic, accurate and effective in its action, and calculated not to damage the street.

My apparatus consists of cutting plates 2 so disposed as to extend beneath the surface of the roadway, and means by which said plates are given a vertical movement; and in conjunction with these plates are opposed resistant surfaces 3, toward which the cutting plates are movable to act as cutters or breakers for narrow strips of material upon each side, thus forming the boundaries of the proposed channel. These narrow strips being broken and lifted out by the action of the cutter, the intermediate portion may then be removable in such sections as may be desired, thus exposing the earth beneath in which the trench may be dug. After

each downward movement of the plates 2, the carriage is advanced for another operation.

The apparatus is here shown as consisting of a frame 4 projecting from the shaft or axle 5 of the bearing-wheels 6.

7 represents springs from which the truck A is supported upon an axle, and 8 are similar springs from which the rear of the frame 4 is hung.

9 are standards or pillar-blocks carried upon the frame 4, and upon these standards are journal-boxes 10 of the shaft 11. Upon this shaft are carried eccentrics or cranks 12, and these are connected by rods 13 with yokes 14 from which the plate holding the cutters 2 are suspended.

The rear ends of the bars or plate which carry the cutters are pivoted or fulcrumed to levers 15 which are pivoted to the frame 4 at 16.

Power is applied to revolve the eccentric shaft by means of a gear 17, the pinion 18 mounted upon a shaft 19 through which the power may be transmitted to produce the necessary leverage for the operation of the apparatus. The operation will then be to alternately raise and depress the cutters 2, the raising action serving to break and cut away a channel in the concrete road surface material. In order to advance these cutters and the apparatus after each upward pull, the upper ends of the lever arms 15 engage with cams or recesses 20 upon each side of the gear-wheel 17, the levers having rollers traveling upon the cam surfaces, and by the action of these cams, the levers 15 are reciprocated upon their shafts or fulcrums 16, so that when the cutters or breakers 2 have descended beneath the road surface, the levers 15 will be swung so as to advance the cutters and force them beneath a new portion, after the carriage carrying the apparatus is advanced by means of a friction clutch or pawl and ratchet connection with the axle 5 of the wheel 6. This connection is made by means of a rod or pitman 21, one end of which is connected with the lever 15, and the other is pivoted to the clutch shaft 22. This clutch shaft has its inner end fixed to a ring 23, and this ring surrounds the hub or drum 24 which is fixed to the axle 5. In the rim of the ring 23 are formed notches or teeth 25.

26 is a pawl pivoted upon the clutch arm 22 and turnable so that either one end or

the other may engage with its respective notch 25, and the reciprocations of the clutch arm 22 will cause the pawl to engage the notch and act to turn the ring in one direction upon the interior drum 24. When the reciprocation of the clutch arm in the opposite direction takes place, the foot of the clutch arm, which is curved to the radius of the exterior of the drum, will be caused to grip the drum, and thus advance it and the vehicle a sufficient distance to project the cutters against the surface, and in position for another cut on the next upward movement. When the cutters are descending, they are thrown back somewhat to clear themselves, and when they reach the bottom of the groove, they perform the important function of taking the weight of the machine; at the same time, with the exception of cutters, the whole mechanism is advanced; the cutters now by the weight of the machine having been forced into the sandy material of the street, are in the next moment pressed forward. The friction of the machine on the surface and sliding brakes under the wheels overcomes all reaction in forcing the cutters forward after each descent.

It will be seen that by this construction I produce an exceedingly simple means for temporarily removing the roadway surface, and leaving it in position to be readily replaced after the sub surface work has been completed.

The working apparatus is so hinged or attached to its truck or carriage, that it may be foldable back thereon for transportation, or when not at work.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A street surface cutting apparatus having in combination suitably fulcrumed levers, cutters carried upon the ends of said levers, and means for exerting an upward pull upon the cutters to cause them to be projected beneath the surface.

2. A street surface cutting apparatus, said apparatus including vertically movable cutters, means for projecting said cutters beneath the surface to be cut, and means for raising the cutters through said surface.

3. In a street surface cutting apparatus, vertically movable cutters, means for projecting said cutters beneath the surface to be cut, opposed resistant surfaces coacting with the cutters, and means for raising, depressing and advancing the cutters.

4. In an apparatus for cutting street and like surfaces, a carriage, arms projecting therefrom in the line of the cut to be made, and having resistant shoes to rest upon the street surface, cutters mounted to extend beneath the surface, means by which said cutters are raised against the surface to coact

with the shoes and form channels in the surface.

5. In an apparatus for cutting street and like surfaces, a carriage, a frame projecting therefrom in the line of travel, shoes carried by the front end of the frame, a revoluble shaft journaled upon the frame, means for revolving said shaft, cranks or eccentrics and connecting rods therefrom to the cutters, and mechanism actuated in unison therewith to intermittently advance the apparatus.

6. In an apparatus for cutting street and like surfaces, a carriage, a frame projecting therefrom in the line of travel of the apparatus, fulcrumed levers, shoes carried upon the forward end of said levers, a crank or eccentric shaft through which power is applied, rods connecting the cranks with the carrying levers, shoes carried by the frame to rest upon the surface to be cut and coacting with the cutters, and clutch-actuated reciprocating mechanism by which the apparatus is advanced after each cut has been finished.

7. In an apparatus for cutting street surfaces, a vehicle, a frame projecting from the vehicle, upwardly extending levers fulcrumed in the frame, cutter carrying levers pivoted to the bottom of said first named levers, a crank or eccentric shaft connections between the crank and the shoe-carrying levers, cams carried by the crank shaft and engaging the upper ends of the first named lever so as to reciprocate it and advance the cutters beneath the surface after each period of depression, and connections between said first named lever and the vehicle whereby the reciprocation of the lever acts to advance the vehicle.

8. In an apparatus for cutting street surfaces, a wheeled vehicle, a frame projecting therefrom in the line of travel, slotted shoes adapted to rest upon the street surface, fulcrumed levers having cutters fixed at the ends, and mechanism by which the cutters are reciprocated and raised beneath the surface coacting with the shoes to make cuts there-through, a vertical yoke lever fulcrumed in the frame, to which lever the cutter levers are fulcrumed, a crank or eccentric shaft with connections whereby the cutters are vertically reciprocated, cams carried by the shaft engaging the yoke lever, and oscillating it to advance the cutters previous to an upward pull thereof, a clutch mechanism carried by the vehicle shaft, and connections beneath said mechanism and the reciprocating yoke lever whereby the vehicle is advanced after each cut has been made.

9. In an apparatus for shearing or cutting grooves, clean through concrete macadamized streets, the combination of a vehicle, a frame projecting therefrom in the line of travel, cutting mechanism, said frame adapted to rest, during the operation, on the sur-

face of the street, a shaft having a wheel, the sides of which wheel are provided with cam channels, eccentrics on the shaft, connections between the eccentrics and the cutting mechanism for suspending the latter, levers pivoted to the frame and connected to the cutting mechanism, said levers having their upper ends engaging the cam channels in said wheel whereby the cutters are given a forward and backward movement, said cutting mechanism including plates secured to said levers and said suspending connections, and cutters on the forward ends of said plates.

10. In a machine with cutters working underground producing an upward stress sufficient to force bituminized concrete, a reacting fracture-protecting plate bolted to the frame, and resting on the surface, advancing levers and connections with said levers, a reversible or neutral clutch for advancing, retracting, or standing still during the motion of the cutters and mechanism for guiding the cutting in the desired direction substantially as shown in the drawings.

11. In a machine for cutting or opening channels through bituminized concrete streets, movably mounted cutters, means for pressing said cutters under the concrete,

shoes resting on the street surface and opposing said cutters, and mechanism to give same cutters an upward motion producing a shearing stress on the bituminized concrete reacting against the shoes, said shoes secured to one end of a truck or carriage and foldable thereon to facilitate transportation and permit adaptation to the surface of the street of the members reacting against the cutters during its operation.

12. A machine for opening channels through bituminized concrete streets and surfaces, said machine including a carriage, bars or cutters extending therefrom, means to advance the cutters beneath the surface, and to impart to them an upward movement, opposing members flexibly connected with the carriage and movable above the surface to produce with the cutters a shearing action upon the concrete, and foldable for transportation.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALFRED ROSENHOLZ.

Witnesses:

CHARLES A. PENFIELD,
CHARLES EDELMAN.