

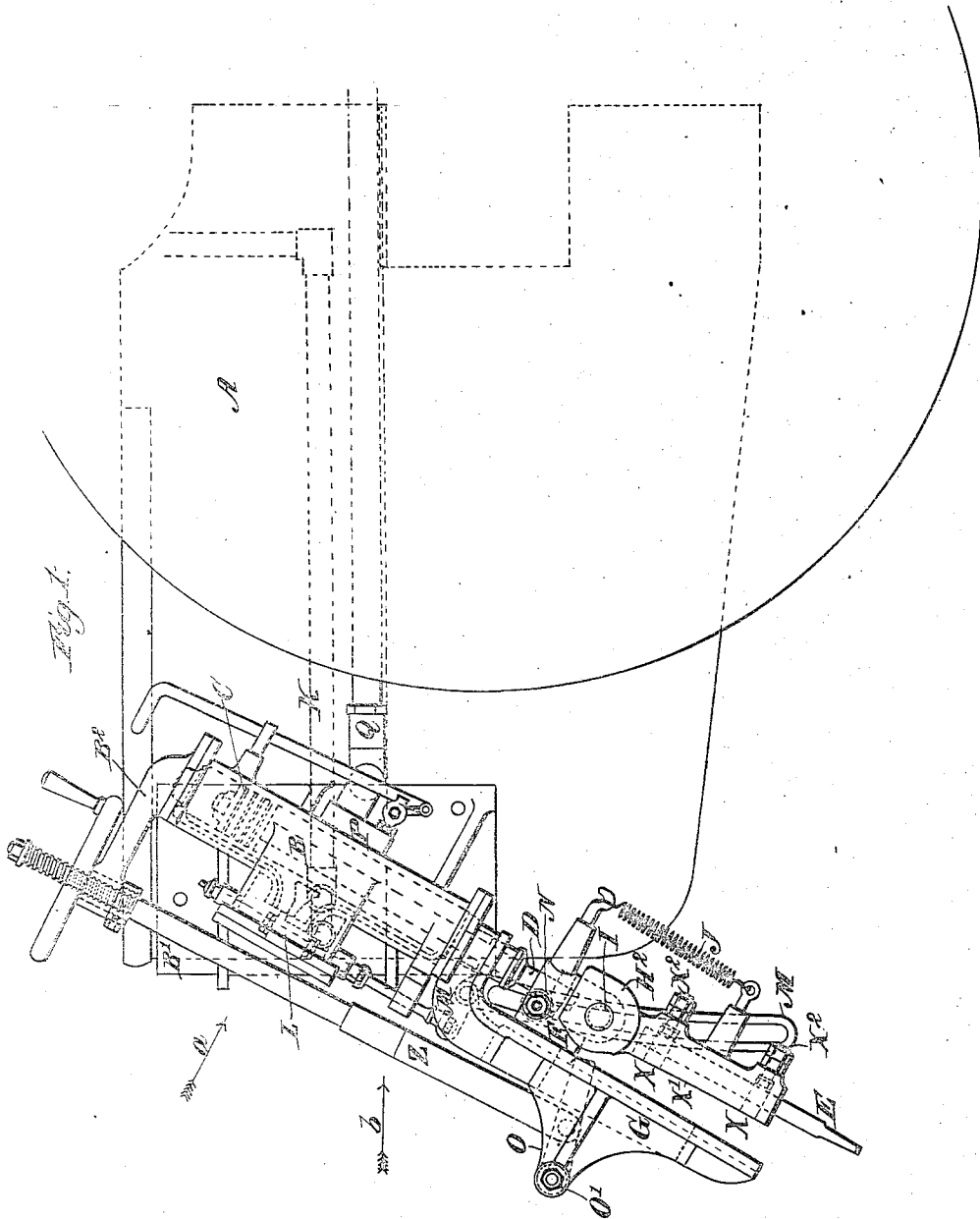
(No Model.)

3 Sheets—Sheet 1.

J. E. WALLIS.
ROAD MACHINE.

No. 494,909.

Patented Apr. 4, 1893.



Witnesses,
Robert Everett,
Thos. A. Jones

Inventor,
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By
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(No Model.)

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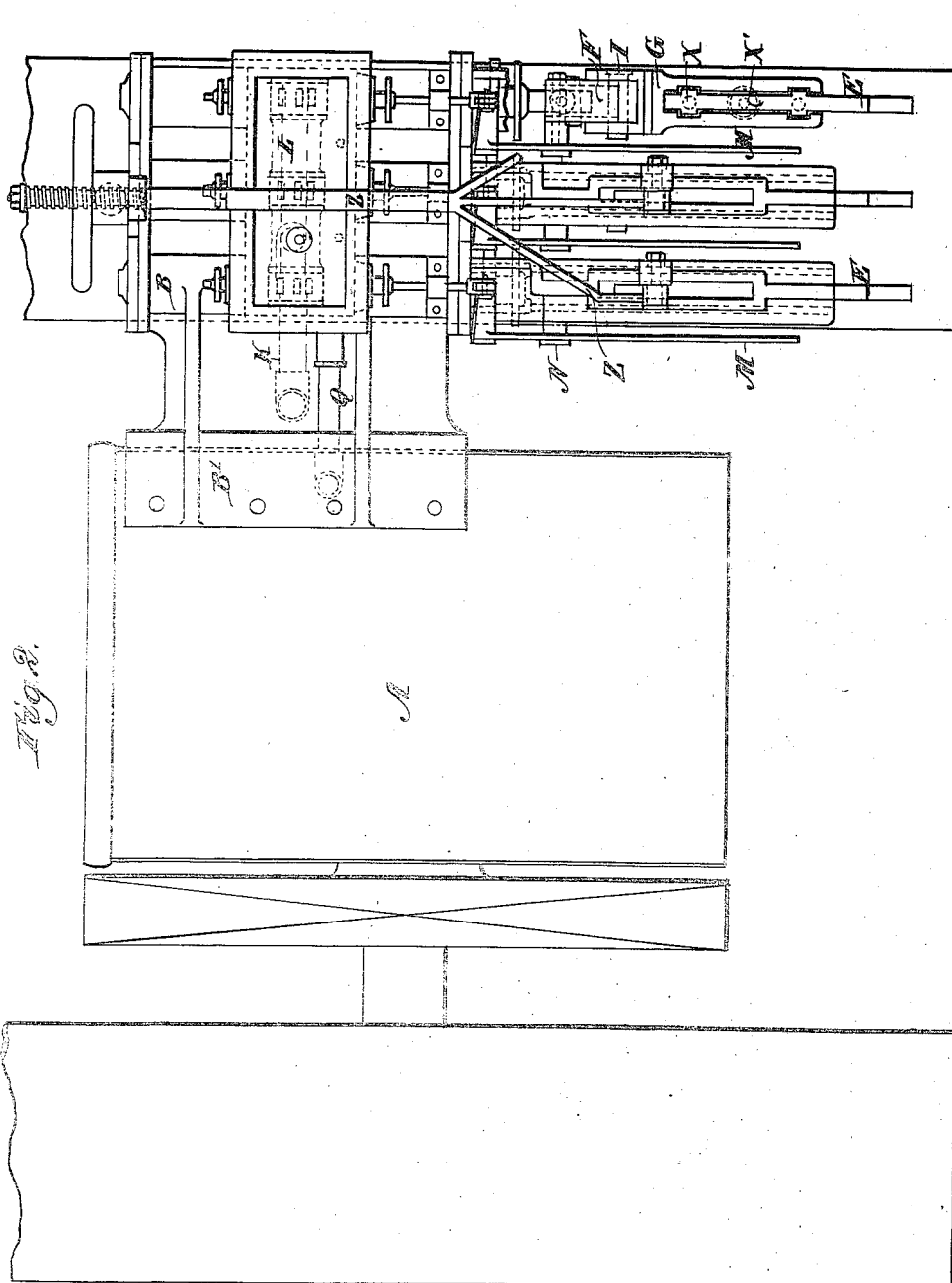


Fig. 2.

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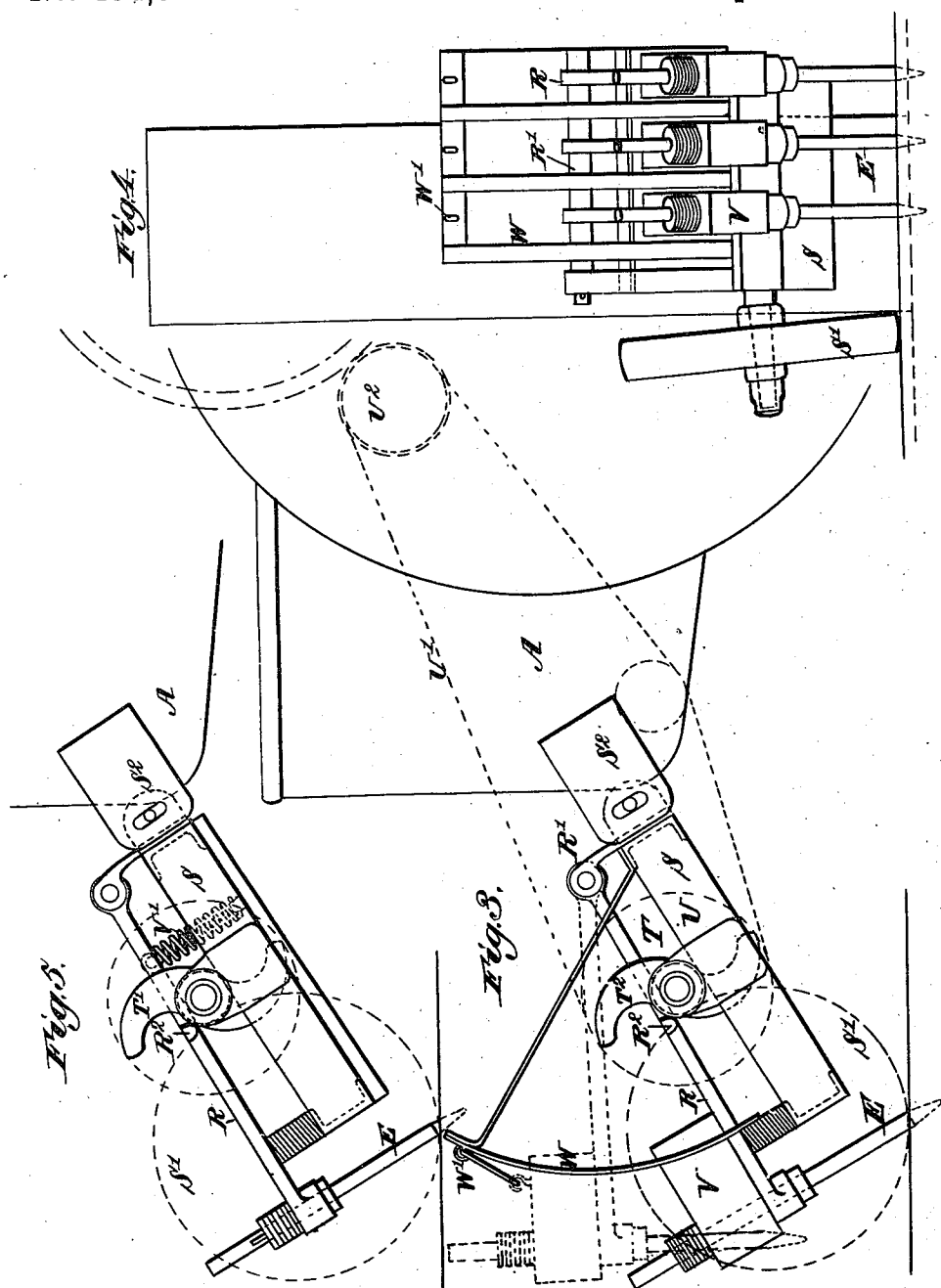
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UNITED STATES PATENT OFFICE.

JOHN ERNEST WALLIS, OF BASINGSTOKE, ENGLAND.

ROAD-MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,909, dated April 4, 1893.

Application filed August 23, 1892. Serial No. 443,921. (No model.)

To all whom it may concern:

Be it known that I, JOHN ERNEST WALLIS, a subject of the Queen of England, residing at Erdesley, Basingstoke, in the county of Hants, England, have invented an Improvement in Road-Machines, of which the following is a specification.

My invention relates to a machine for picking and loosening the surfaces of roads where-
in one or more picks or picking tools is or
are made to operate by a reciprocating per-
cussive action upon the surface of the road so
as to penetrate to a sufficient extent into the
same to break it up. The said tools are for
this purpose arranged to be alternately raised
and dropped or forced downward by steam or
other power acting upon pistons or lever arms
to which the tools are attached or the tools
are placed so as to receive the stroke from
such pistons or lever arms. When several
tools are employed, they may be actuated
either consecutively or simultaneously.

The said apparatus can either be combined
with an ordinary road engine or steam roller,
the steam from which is made to actuate the
picks or picking tools, or the apparatus can
be mounted by itself on wheels and be worked
either by steam from a boiler on the vehicle,
or by a motion derived by gearing from the
road wheels.

From the above it will be seen that the said
machine can be constructed in a variety of
ways for carrying out the purposes of the in-
vention; by way of example I will describe
some of the arrangements which I prefer to
employ, for which purpose I will refer to the
accompanying drawings.

Figure 1 shows a side elevation of one ar-
rangement, as applied to a steam roller. Fig.
2 shows a front view of the picking apparatus
the cylinders and the picking tools being
viewed in the direction *a* Fig. 1, and the foot
of the cylinder casting B' in the direction *b*.
Fig. 3 is a detail side view showing a modifi-
cation of my invention. Fig. 4 is a detail end
elevation, and Fig. 5 is a detail side elevation
showing another modification.

To the side or end of a steam roller or road
engine A of any known construction is fixed
by a foot B' a casting B constituting three
steam cylinders arranged side by side, and

each containing a piston C, the piston rod D
of which carries at its lower end the picking
tool E. The piston rod has for this purpose
a head F keyed on it which slides on a guide
G fixed to the cylinder and to which is piv-
oted a socket piece H in which is secured the
picking tool E.

The socket piece H is connected to the head
F by a pin I the head being made to fit with
a semicircular end surface against a corre-
sponding hollow of the socket piece H so that
the shock of impact in operating is taken by
these surfaces and not by the pin I. The hol-
low of the socket piece also bears with a
straight side against the one straight side of
the head F, while the other side of the socket
piece is open. It is held with the straight
side abutting against the head by means of a
spring J connecting the two parts as shown.
When in this position the center line of the
picking tool E is by preference made to form
a small inward angle with the center line of
the piston rod, as shown, for a purpose to be
presently stated.

Steam is supplied to the slide chest of the
cylinders B by a pipe K, and is admitted to
the cylinders by ordinary slide valves L, actu-
ated by elbow levers M pivoted to the guide
G the cranked short arm of which lever is
connected to the slide rod, while the long arm
is slotted, and engages with a stud N on the
head F of the piston rod, so that by the re-
ciprocating motion of the latter a vibrating
motion is imparted to the lever M, causing
the slide valve to be moved so as to alter-
nately admit steam on either side of the pis-
ton, and thus to effect the reciprocating mo-
tion of the picking tool so that on this being
propelled downward by the steam pressure it
is caused to penetrate to a certain extent into
the road surface. Owing to the before men-
tioned slightly angular position of the pick-
ing tool E relatively to the piston rod, it will
be seen that as the steam roller advances with
the apparatus in the direction of the arrow,
the tool holder H will not be liable to give
way at its pivot I when the tool strikes the
ground, as it might do if the tool were in line
with the piston rod, thereby preventing ef-
fective penetration. After being driven into
the ground by the percussive action, the tool

and socket will turn on the center pin I firstly into the position in line with the piston rod, and then in being dragged along, it will turn still farther on its pin and will operate with
 5 a certain leverage upon the ground in front of it so as to break it up. On being withdrawn by the upstroke of the piston, the tool E will at once be drawn back into its original position by the spring J.
 10 The tool E is secured in its holder II by means of two loops X X in an open groove of the holder through which loops it passes. The loops are connected together by a bar X' and they are formed on screw bolts X² that
 15 pass through the holder II and are provided with nuts as shown so that by screwing these up, the loops will nip the tool tightly in the groove of the holder, the end of the tool being made to butt against the end of the groove,
 20 with or without the intervention of packing pieces for adjustment.

When the apparatus is not in use the pistons and their picks are held in the raised position by means of lever arms O pivoted at
 25 O' to the guides G through slots in which they are made to project underneath the end of the head F by means of a forked screw rod Z carried by brackets B³ on the cylinders as shown. When the apparatus is to be set to
 30 work, the levers O are moved downward by the rod Z until they are out of the groove of the guide bar in which the head F works. The exhaust from the steam cylinders is led from the exhaust chamber P through a pipe
 35 Q to the smoke box of the boiler. The angle at which the cylinders and picks are shown inclined to the ground line is that which has been found to be most advantageous; they may however be inclined at other angles, or
 40 they may even be arranged vertically. The steam cylinders might also be made single acting, raising the piston against the action of a helical spring interposed between the end of the cylinder and the piston rod head, which
 45 spring would then effect the working downstroke.

It will be evident that various other arrangements of valves may be used for working the steam cylinders.

50 Fig. 3 shows a side view and Fig. 4 a part front view of an arrangement in which the picks E are carried at the ends of levers or arms R pivoted at R' to an inclined frame S the lower end of which is carried by road
 55 wheels S' while the upper end is pivoted at S² to the engine framing A. On the frame S is mounted a shaft T carrying cams T' and receiving rotary motion from the engine gearing by pulleys and belt or pitch wheels and

chain U U' U². The cams T' in revolving act
 60 on lugs R² on the levers R so as to raise these together with the picks into the dotted position shown at Fig. 3; on the cams leaving the lugs, the lever arms with the picks fall down and penetrate the road surface as shown, the
 65 force of the downward motion being increased either by a weight V as at Figs. 3 and 4 or by a spring V' as at Fig. 5. The lever arms R are guided in their motion by guides W fixed to the frame S, and when not in use they are
 70 held in the dotted raised position by suspending them from eyes W' on the top bar of the guides.

The above described arrangement of the picks or picking tools might also be carried on
 75 a single vehicle the road wheels of which would impart the requisite rotary motion to the cams T' by pitch wheels and chain or other suitable gearing.

Having thus described the nature of my invention and the best means I know for carrying the same in practical effect, I claim—

1. A machine for pecking or loosening the surface of roads and similar hard surfaces consisting of one or more pecks or picking tools
 85 operated by the pistons of fluid pressure cylinders or equivalent means so as to act percussively or with blows upon the said surface, the said pecks or picking tools being jointed and free to turn on a pivot at right angles to
 90 their axes and mounted on wheels so as to travel over the road while they operate thereon, substantially as described.

2. In a machine for pecking or loosening the surface of roads, and similar hard surfaces the combination of a peck E pivoted to
 95 a head on the piston rod D of a cylinder C worked by fluid pressure, a spring J tending to hold the peck E against a stop on the head F, a guide G for guiding the piston rod head F and peck E in their motion, a slotted lever M actuated by a stud on the head F and controlling the slide valve L of the cylinder C, and a vehicle A carrying a supply of fluid
 100 pressure, substantially as described.
 105

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of August, A. D. 1892.

JOHN ERNEST WALLIS.

Witnesses:

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