No. 890,659.

PATENTED JUNE 16, 1908.

A. F. KELLNER.

TAMPING MACHINE.

APPLICATION FILED SEPT. 10, 1907.

4 SHEETS—SHEET 1.

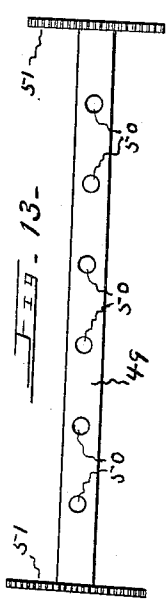


Fig. 13.

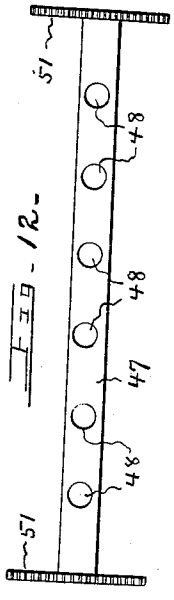


Fig. 12.

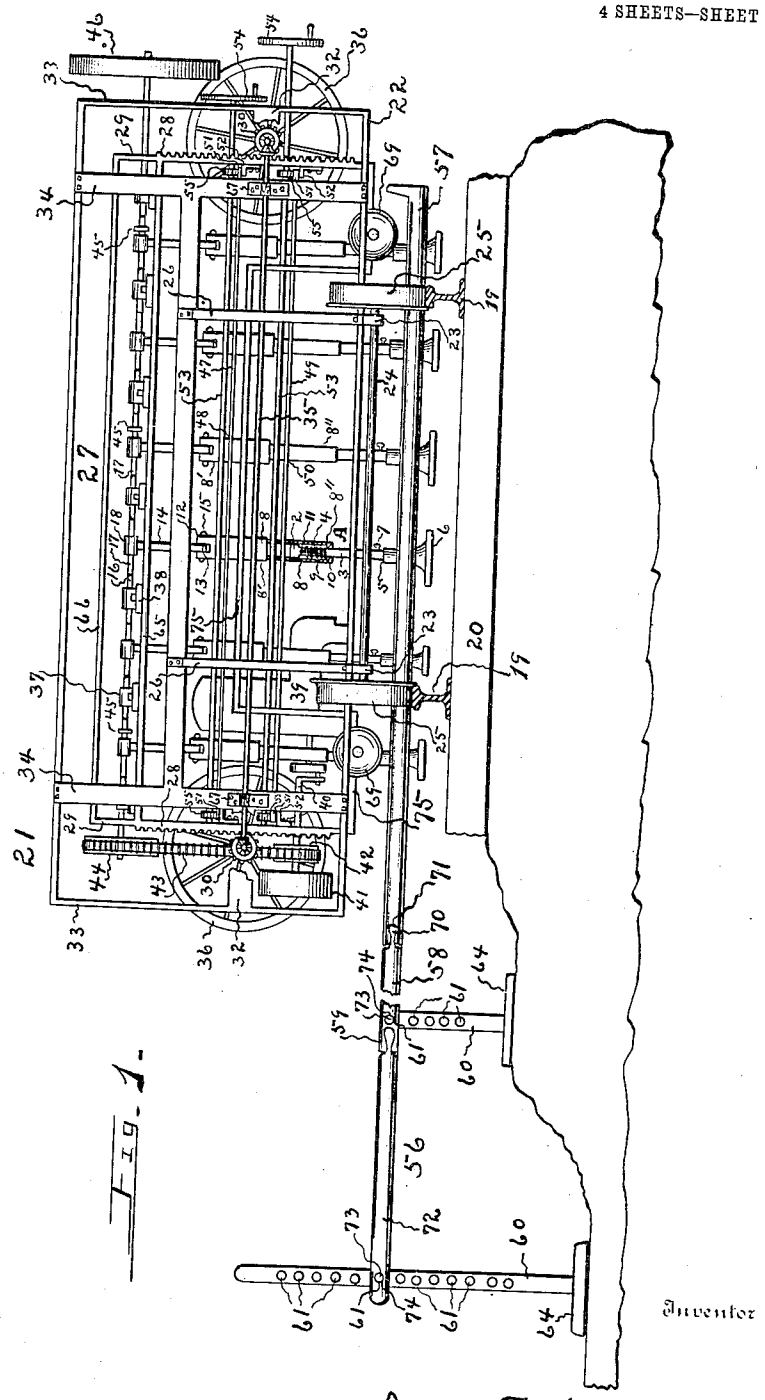


Fig. 1.

Inventor

Witnesses

H. C. Compton,

N. Lenger.

By Anton F. Kellner,

Hiram A. Sturges

Attorney

No. 890,659.

PATENTED JUNE 16, 1908.

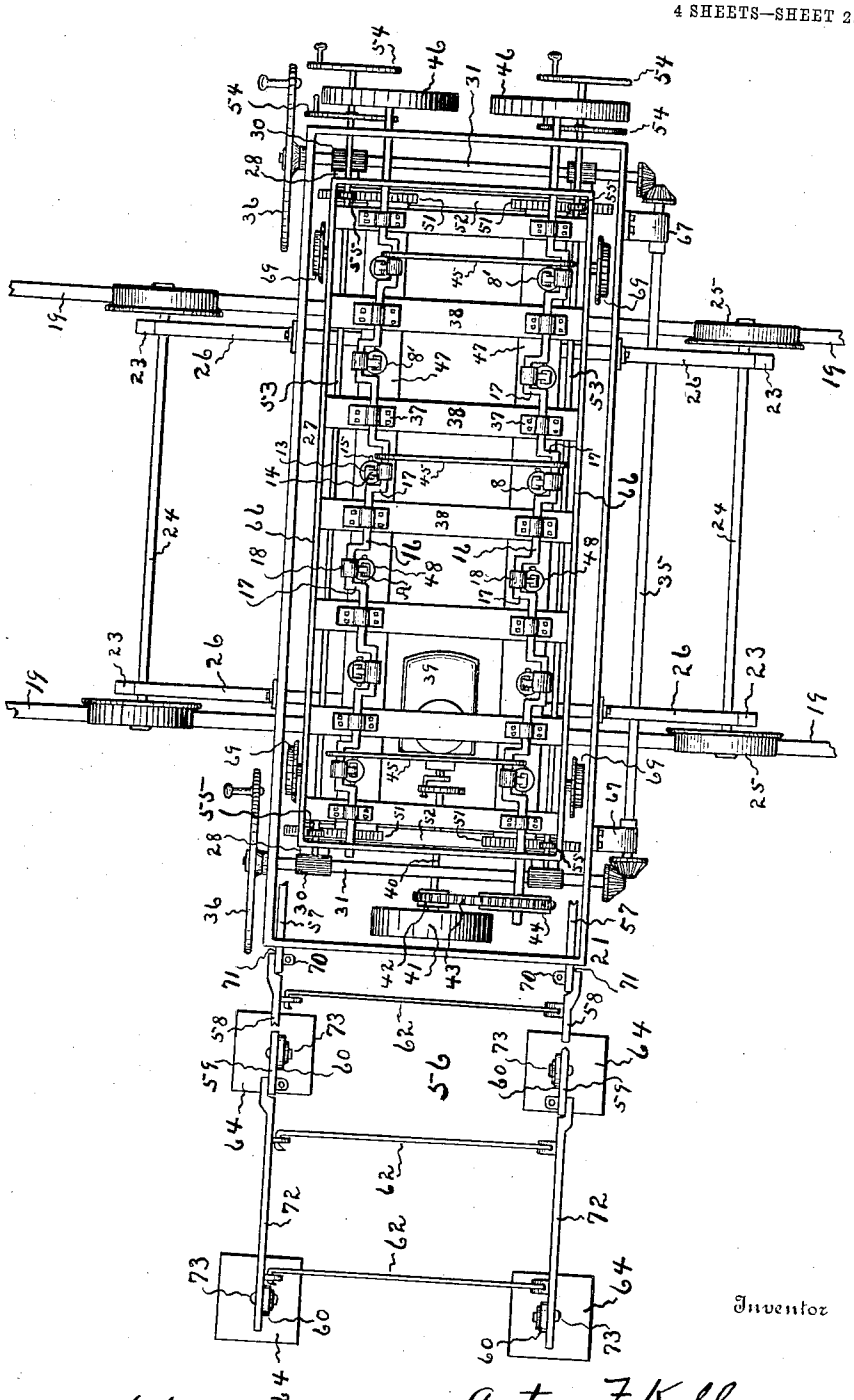
A. F. KELLNER.

TAMPING MACHINE.

APPLICATION FILED SEPT. 10, 1907.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

H. C. Compton.

N. Zenger.

Inventor

Anton F. Kellner,

By Hiram A. Sturges,

Attorney

No. 890,659. PATENTED JUNE 16, 1908.

A. F. KELLNER.

TAMPING MACHINE.

APPLICATION FILED SEPT. 10, 1907.

4 SHEETS—SHEET 3.

Fig. 3.

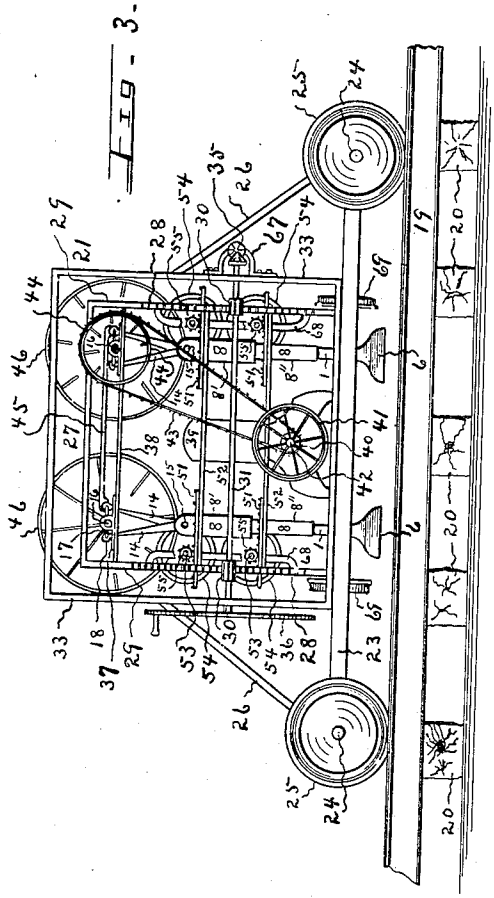


Fig. 5.

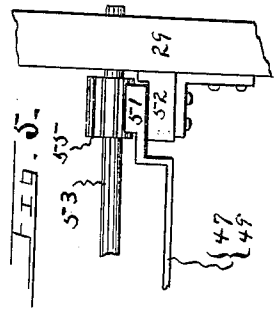
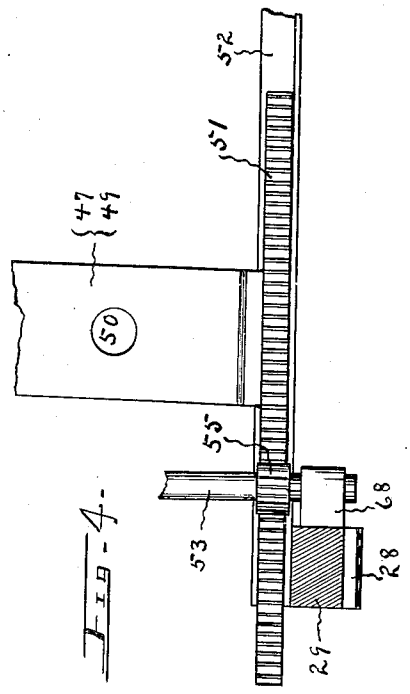


Fig. 4.



Witnesses

H. C. Compton.

N. Lenger.

Inventor

Anton F. Kellner

By Hiram A. Sturges.

Attorney

No. 890,659.

PATENTED JUNE 16, 1908.

A. F. KELLNER.

TAMPING MACHINE.

APPLICATION FILED SEPT. 10, 1907.

4 SHEETS—SHEET 4.

Fig. 6.

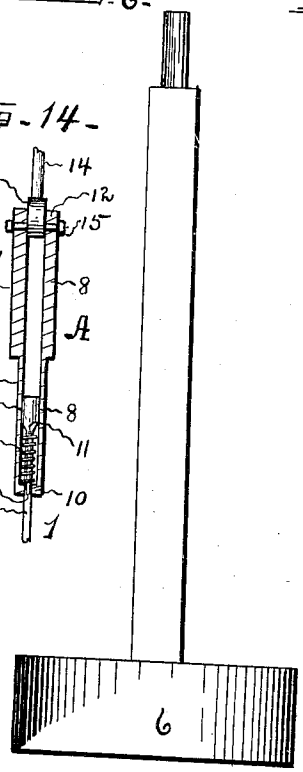


Fig. 7.

Fig. 8.

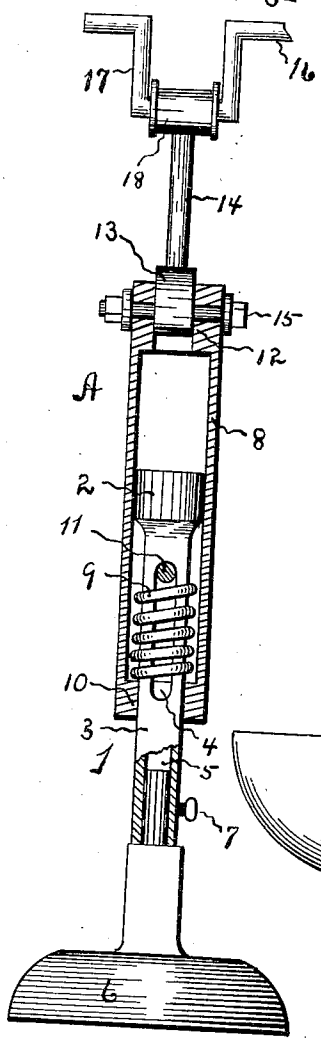


Fig. 9.

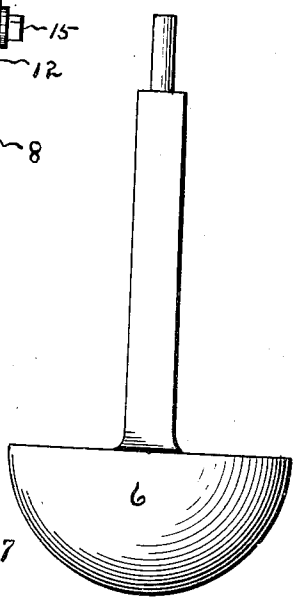


Fig. 14.

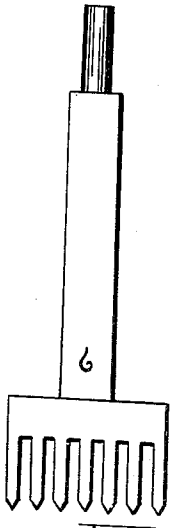


Fig. 10.

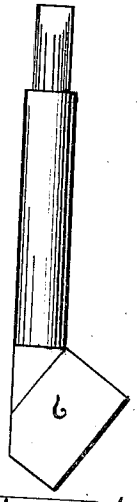


Fig. 11.

Witnesses
H. C. Compston.
N. Zinger.

Inventor
Anton F. Kellner,
By Hiram A. Sturges,
Attorney

UNITED STATES PATENT OFFICE.

ANTON F. KELLNER, OF OMAHA, NEBRASKA.

TAMPING-MACHINE.

No. 890,659. Specification of Letters Patent. Patented June 16, 1908.

Application filed September 10, 1907. Serial No. 392,158.

To all whom it may concern:

Be it known that I, ANTON F. KELLNER, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Tamping-Machines, of which the following is a specification.

This invention relates to improvements in tamping machines and has reference to the employment of a series of plungers, each slidably and resiliently mounted in a casing or sleeve, each sleeve near its upper end being pivotally mounted upon a link to receive actuation from rotatable crank-shafts, the bottom of the plungers adapted to have removably secured therein any desired cutting or tamping-head; and the invention includes certain constructions and arrangements of frame work and mounting of mechanism thereon found to be useful and convenient.

The novel features of the invention are fully described herein and in the appended claims, and illustrated in the accompanying drawings, wherein,—

Figure 1 is a vertical, side view of the invention, a part of the escape-way or cross-track being broken away. Fig. 2 is a plan view of parts shown in Fig. 1, a part of temporary rails or tracks 57 being removed, and Fig. 3 is a vertical end view of the invention. Fig. 4 is a broken-away plan view of a supporting-bar, one of the horizontal and slidable rack-bars being shown with broken-away web, the corner post of the inner frame being shown in section. Fig. 5 is a side view of the parts shown in Fig. 4, the corner post of the inner frame being broken away. Figs. 6, 7, 9, 10 and 11 are vertical side views of tamping or cutting implements used in connection with the invention. Fig. 8 is a sectional view of one form of the sleeve or casing, mounted upon a link to receive actuation from a crank, the slidable, resiliently-mounted plunger being partly in section. Figs. 12 and 13 are plan views showing, respectively, webs 47 and 49. Fig. 14 is a somewhat similar view to that shown in Fig. 8, but reduced and broken-away; it is introduced to illustrate a modification of the form of the sleeve or casing 8.

Referring now to the drawings for a more particular description, numeral 1 indicates a plunger having a head 2, a shank 3, the latter being provided with a longitudinal slot 4 therein and formed with an opening 5 at its bottom to receive any convenient pounding, tamping or cutting-head or implement, as indicated by numerals 6, secured to the shank, as by key 7.

A casing or sleeve is indicated at 8 and is formed with an opening of a diameter substantially equal to that of head 2, and of a less diameter than the shank of the plunger, that the coiled spring 9 may be seated within the sleeve between the walls of the shank and sleeve. The lower terminal of the sleeve is inturned or projected inwardly to approach the surface of shank 3, thereby forming the detaining-head 10; I provide the engaging-pin 11 secured transversely and centrally of sleeve 8 to traverse slot 4 and limit the outward movement of the plunger; spring 9 may have bearings upon pin 11 and head 10, and the parts thus named may be said to describe a tamping-member A. The upper terminal of sleeve 8 is formed or operates as a socket 12 to receive the head 13 of link 14, this link having one of its ends pivotally mounted therein as indicated by pin or bolt 15. I provide crank-shafts 16, provided with cranks 17 formed thereon to extend alternately from the shaft, in opposite directions, and heads 18 of links 14 have pivotal mountings upon each of cranks 17.

By reason of the arrangement described, the parts may be constructed of any desired thickness or solidity to withstand the high degree of vibration incident to their uses. It is intended that the plunger will be driven upward at each downward stroke of the crank when implement 6 strikes upon an obstruction, the force of the concussion being received upon spring 9, at which time the force of the blow will be communicated to pin or bolt 11 and head 10 of the sleeve, head 2 of the plunger at this time having a limited upward sliding movement within the sleeve. The modified form for the sleeve or casing shown by Fig. 14 is considered preferable for heavy construction work, its upper end having a wall 8′ of greater diameter, and therefore heavier, than its lower end 8″.

For use of the parts above described, in road-bed construction for trackways, I employ the same in connection with certain framework, mechanisms and devices now to be described, and best shown in Figs. 1, 2 and 3.

Numerals 19 indicate car-rails or a trackway supported upon ties 20, and for the purpose of operating between or above the ties in construction where rock, cement or other

material is used for a road-bed, I construct the angular, outer frame 21 having bottom plates or sills 22 at its sides, these sills being secured in any convenient manner transversely and rigidly upon platform, 23, the latter being preferably boxed or apertured to receive axles 24; and wheels 25 are used in connection with axles 24, said wheels resting upon track or car-rails 19, and I employ braces 26 each secured at its lower end upon an outer end of the platform and adjacent one of wheels 25, said braces passing inclinedly upward with their opposite ends secured upon a side of the outer frame, and as thus described, the platform and parts supported thereon may be moved any desired distance along track 19.

I construct the inner angular frame 27 containing several devices presently to be described, the weight thereof being sustained by frame 21. I provide vertical racks 28 formed upon the outer face of each corner post 29 of the inner frame, and said racks have engagement with pinions 30 secured upon the horizontal end-shafts 31 of the outer frame; end-shafts 31 have mountings upon horizontal plates 32 which connect corner posts 33 of the outer frame with the vertical side-plates 34 of said outer frame, near the front and rear of the machine; the horizontal plates 32 provide adequate mountings for the end-shafts, and are shown in the drawing (Fig. 1.) as partly broken away, that other parts may be shown. Shafts 31 are geared to rotate in unison by means of connecting-shaft 35 and its miter gear connections, this shaft extending horizontally and lengthwise of the outer frame and suitably supported thereon as by boxings 67 secured upon the vertical side-plates 34.

By manually rotating either one of elevator-wheels 36, pinions 30 will be actuated to cause racks 28 and the entire inner frame to be raised or lowered with reference to the outer frame, since elevator-wheels 36 are mounted upon end-shafts 31. The purpose of raising or lowering the inner frame is to adjust the altitude of tamping-heads or implements 6, that the latter may make a proper contact with the material operated upon during the tamping process, at each downward stroke of tamping-member A; another purpose being to elevate the outer frame together with platform 23 and wheels 25 a sufficient height above the main track 19, that the entire machine may be temporarily removed from said track 19, by means presently to be described.

I employ two crank-shafts 16, each mounted in suitable boxings 37, the latter being secured upon supporting-plates 38, these plates being secured horizontally and transversely upon side-rails 65 which extend parallel with and below the top side-rail 66 of the inner frame; said crank-shafts are disposed parallel with reference to each other, their bearings being near a side rail 65, within the plane of the inner frame; and to actuate the crank-shafts I employ any desired or adequate power to be carried upon the inner frame, as engine 39 supported in any convenient manner upon said inner frame; and balance-wheel 41 and sprocket-wheel 42 are mounted upon engine shaft 40.

By means of sprocket-chain 43 which connects wheel 42 with sprocket-wheel 44 mounted upon the end of one of crank-shafts 16, the latter receives actuation to cause downwardly-directed blows to be delivered by the series of tamping-heads 6, already described.

Crank-shafts 16 are connected to rotate in unison, as by transversely-disposed links 45, these links having their terminals seated upon some of the oppositely-disposed cranks 17 of each crank-shaft 16, and thereby actuation of both crank-shafts will be made from the movement of the sprocket-wheel 44, and upon the rear end of the crank-shafts are secured fly wheels 46, their use being to prevent undue vibration of these parts during operation.

It is desirable to have control of the movements of sleeves or casings 8 and plungers 3 to effect a vertical movement of these parts when actuated by cranks 17 and links 14, and therefore I employ two pairs of apertured webs which are substantially alike except as to size of the apertures; the upper pair of webs 47 are disposed upon the same horizontal plane and have apertures 48 to receive therein the upper ends 8′ of sleeves 8; the lower pair of webs 49 are disposed upon one horizontal plane and have apertures 50 therein to receive the reduced ends 8″ of said sleeves, apertures 48 and 50 extending vertically through the webs. The pairs of webs 47 and 49 have substantially equal length and extend practically the length of the inner frame, but upon planes of different altitudes. Apertures 48 are of a size equal to the diameter of the upper end 8′ of sleeves 8 or slightly in excess thereof, and apertures 50 are of a size corresponding to the diameter of the reduced ends 8″ of said sleeves, the intention being to form the apertures to permit a vertical movement of the sleeves therein; the webs have certain mountings and their movements are controlled by means presently to be described.

During operation of the machine and when crank-shafts 16 are rotated, each of sleeves 8 as well as plungers 3 have movements the tendency of which is to swing sidewise of the machine, from actuation of links 14; the webs with apertures 48 and 50 operate as guides to prevent swinging of the sleeves and plungers; it will be understood that plungers 3 will slide longitudinally within sleeves 8 since heads 2 have bearings upon the inner

wall of the sleeves and the bodies of the plungers have bearings upon the inner walls of detaining-heads 10, but to control the movement of the plungers it is necessary to control the movement of the sleeves to prevent said sidewise movement, and therefore the apertured webs are employed, and during operation of the machine, while links 14 are actuated with considerable force, their movements are not particularly rapid, and the limited movement of the sleeves or parts of the sleeves when moving within their guides or apertures, is smooth and vertical; the sidewise movement of the webs must be controlled, as matter of course, and this will be explained.

Alining-members 47 and 49 are called webs because they are plates or webs which extend between oppositely-disposed rack-bars 51, to which their ends are secured, and, to effect a control and an adjustment of each web, said rack-bars 51 are employed, said rack-bars being slidably seated upon and supported by rack-bar plates 52, the latter being secured upon corner-posts 29 of the inner frame; I employ rack-bar shafts 53 having suitable bearings upon arms 68, the latter being secured upon corner-posts 29 or constructed integral therewith. Shafts 53 extend parallel with the webs and their bearings are above and adjacent rack-bars 51, the latter extending transversely of the inner frame. Shafts 53 are provided with wheels 54 secured upon their rear ends, and with pinions 55 which engage rack-bars 51; and by manually rotating wheels 54, pinions 55 will cause a transverse sliding movement of these rack-bars, and thereby the webs, or any of the webs, may be moved transversely and horizontally toward the middle or sides of the machine. Pinions 55 are geared with rack-bars 51 so that a rotation of a shaft 53 will cause the rack-bars to move in unison upon that shaft, and therefore the webs and apertures are reserved parallel with the machine and with the crank-shaft 16 with which it coöperates. By reason of the lateral movement which may be imparted to the webs, as above described, it will be understood, that blows made by heads 6 may be delivered upon lengthwise space of the road bed, and this is the function discharged by the webs. Since the apertures of any single web are in longitudinal alinement sleeves 8 and plungers 3 will be controlled by that web to remain in longitudinal alinement, and when the machine is in operation, tamping-heads 6 will deliver blows in a corresponding line across the space to be constructed.

Since the pairs of webs 47 and 49 are upon different horizontal planes, a control of the movement of casings or sleeves 8 is more readily made to confine said sleeves to a vertical movement. The vertical distance which sleeves 8 and plungers 3 will move at each rotation of crank-shaft 16 depends, of course, upon the length of crank-arm 17, and only a limited distance is required. Since the plungers are resiliently mounted, vibration is much reduced. Implements 6 may be of any desired shape, and in practice, sets of implements are employed of different lengths, as may be desired.

Since the inner frame 27 is vertically movable and under control, it may be lowered sufficiently to cause heads 6 to reach the lowest position between the ties or to reach the bottom of a road bed, and the inner frame may be readily elevated for tamping material at higher altitudes; and when one part of a trackway has been completed the machine may be moved upon track 19 to any unfinished part.

When used in connection with railway construction, it may be desired to remove the machine from track 19 temporarily on account of passing trains, and therefore a cross-track or escape-way 56 is employed, consisting of rails used in pairs, upon which the machine-wheels 69 mounted upon the lower parallel side-sills 75 of the inner frame may rest; a pair of temporary rails is placed crosswise of track 19 to occupy a position below machine-wheels 69, as temporary rails 57, shown in Fig. 1, and by manually rotating elevator-wheels 36 the inner frame will be lowered until said machine-wheels rest upon said temporary rails 57; a continuation of rotation of elevator-wheels 36 will cause wheels 25 to be elevated above track 19, the weight of the entire machine resting then upon the machine-wheels 69; one end of the pair of rails 58 is then secured to the ends of rails 57, as by hooks 70 of the rails of pair 58 passing within aperture 71 formed in the ends of rails 57, or by any other convenient means; and to the pair of rails 58 the pair 59 may, in like manner be secured, and the pair of temporary rails 72, may also be used; supporting-posts 60 are employed, these posts being constructed of different lengths, and provided with openings 61 formed therein; the pairs of rails mentioned, when placed end-to-end have a combined length, as a trackway, sufficient to support thereon the entire machine, and the temporary trackway may be adjusted to a height practically upon a level with track 19, and this temporary trackway may be supported upon an ordinary railway embankment since posts 60 are of different lengths; bolts 73 are used to register with openings 61 of posts 60 and openings 74 of the temporary rails to secure these rails at the desired altitude. Horizontal alining rods 62 are used between each of the rails of each pair to secure equi-distanced the rails of the temporary trackway; posts 60 are provided with broad bases 64 to aid in maintaining said posts in a vertical position; and after the machine has been moved from

track 19, rails 57 are removed, that there may be no obstruction to a passing train.

By the arrangement just described, the temporary trackway may be readily placed in operative position, and afterwards may be disjointed and placed upon platform 23 where it is carried, when not in use. Since implements or heads 6 are employed in sets, and the lengths of the shanks of these sets vary, when temporarily removing the machine from the main trackway, these heads or implements may be removed, if desired or if obtrusive.

Having quite fully described function of parts, operation of the machine will be understood. When in use upon a railway road bed, the machine may be moved upon wheels 25 upon trackway 19 to any desired point. When used upon a highway or for street construction the temporary trackway 56 may be useful for moving the machine to a convenient position transverse to the direction of wheels 25.

Crank-arms 17 are shown oppositely-disposed upon crank-shafts 16 and this is the desired construction, but it is considered that other crank-arms could be employed and extended radially from the shaft, without departing from the scope of the invention.

What I claim as my invention is,—

1. A tamping machine, comprising a suitably supported outer frame, an inner frame disposed within the vertical plane of and vertically movable with relation to the outer frame; a rotatable shaft mounted upon the inner frame and having a plurality of resilient, vertically movable tamping members mounted thereon.

2. A tamping machine, comprising a suitably supported outer frame, an inner frame disposed within the vertical plane of and vertically movable with relation to the outer frame; a plurality of rotatable shafts mounted upon the inner frame, each having a plurality of resiliently formed, vertically-movable tamping members mounted thereon.

3. A tamping machine, comprising a suitably supported outer frame, an inner frame connected with and vertically movable with relation to the outer frame, a rotatable shaft mounted upon the inner frame and having a crank thereon; a downwardly-extending tamping member having parallel sides disposed below the plane of said crank; a guide upon the inner frame having a connection with the parallel sides of the downwardly-extending tamping member; a link disposed between and having its ends pivotally mounted upon said crank and one of the ends of said downwardly-extending tamping member.

4. A tamping machine, comprising a suitably supported outer frame, an inner frame connected with and vertically movable with relation to the outer frame, a rotatable shaft mounted upon the inner frame and having a plurality of cranks thereon; a plurality of downwardly-extending tamping members, each having parallel sides and disposed below the plane of said cranks; a guide upon the inner frame and having a connection with the parallel sides of each of the downwardly-extending tamping members; links disposed between and having pivotal end-connections with said cranks and with the upper ends of said downwardly-extending tamping members.

5. A tamping machine, comprising a suitably supported outer frame, an inner frame connected with and vertically movable with relation to the outer frame, rotatable shafts mounted upon the inner frame and having cranks thereon; resiliently-formed, downwardly-extending tamping members, each having parallel sides, and disposed below the horizontal plane of said cranks; guides upon the inner frame and having connections with the parallel sides of each of the resiliently-formed downwardly-extending tamping members; links disposed between and having pivotal end-connections with said cranks and with the upper ends of said resiliently-formed downwardly-extending tamping members.

6. The combination of an outer frame, an inner frame supported and vertically movable upon the outer frame; a revoluble shaft upon the inner frame and having radially extending crank-arms thereon; downwardly-extending sleeves pivotally mounted upon said radially-extending crank-arms of the revoluble shaft, each of said downwardly-extending sleeves having a tamping-head removably mounted thereon.

7. In a tamping machine, an outer frame, an inner frame supported and vertically movable upon the outer frame; a revoluble shaft upon the inner frame and having radially-extending crank-arms thereon; downwardly-extending sleeves pivotally mounted upon the radially-extending crank-arms of the revoluble shaft, each of said downwardly-extending sleeves having a tamping-head resiliently mounted thereon.

8. In a tamping machine, an outer frame, an inner frame supported and vertically movable upon the outer frame; revoluble shafts upon the inner frame, each of said revoluble shafts having oppositely-disposed crank-arms thereon; downwardly-extending sleeves pivotally mounted upon the oppositely-disposed crank-arms of said revoluble shafts, each of said downwardly-extending sleeves having a tamping-head resiliently and removably mounted thereon.

9. The combination of an outer frame, an inner frame vertically movable upon the outer frame; a revoluble shaft upon the inner frame and having oppositely-disposed crank-arms thereon; downwardly-extending tamping members; said downwardly-extending tamping members having parallel

sides disposed below the plane of and pivotally mounted upon the crank-arms of said revoluble shaft; a guide movable upon the inner frame and having a connection with the parallel sides of said downwardly-extending tamping members.

10. In a tamping machine, an outer frame, an inner frame vertically movable upon the outer frame; a revoluble shaft upon the inner frame and having oppositely-disposed crank-arms thereon; downwardly-extending sleeves pivotally mounted upon the oppositely-disposed crank-arms of said revoluble shaft, each of said downwardly-extending sleeves provided with a tamping-head resiliently mounted thereon; a guide movable upon the inner frame and having a connection with the downwardly-extending sleeves.

11. In a tamping machine, an outer frame, an inner frame vertically movable upon the outer frame; revoluble shafts upon the inner frame, each of said revoluble shafts having crank-arms thereon; resiliently-formed, downwardly-extending tamping members each having parallel sides, said resiliently-formed, downwardly-extending tamping members being disposed below the horizontal plane of said crank-arms; guides movable upon the inner frame and having connections with the parallel sides of each of the resiliently-formed, downwardly-extending tamping members; links disposed between and having pivotal end-connections with said crank-arms and with the upper ends of said resiliently-formed, downwardly-extending tamping members.

12. In a tamping machine, an outer frame provided with horizontal end-shafts with pinions thereon, an inner frame disposed within the vertical plane of the outer frame and having vertical racks formed upon its ends engaging the pinions of said horizontal end-shafts, a revoluble crank-shaft having oppositely-disposed cranks thereon and mounted upon the inner frame transversely with reference to the horizontal end-shafts of the outer frame, a downwardly-extending tamping member having parallel sides disposed below the horizontal plane of the oppositely-disposed cranks of the revoluble crank-shaft, said downwardly-extending tamping members having pivotal mountings upon the oppositely-disposed cranks of said revoluble crank-shaft; a web horizontally disposed upon the inner frame parallel with said revoluble crank-shaft and having a connection with the parallel sides of the downwardly-extending tamping members, to form guides; means to cause a rotatable movement of the horizontal end-shafts of the outer frame, and means to cause a horizontal movement of said web.

13. In a tamping machine, an outer frame provided with horizontal end-shafts with pinions thereon, an inner frame disposed within the vertical plane of the outer frame and having vertical racks formed upon its ends in engagement with the pinions of said horizontal end-shafts; revoluble crank-shafts having oppositely-disposed cranks thereon and mounted upon the inner frame parallel with reference to each other and transversely with reference to the horizontal end-shafts of the outer frame; downwardly-extending tamping members each having parallel sides disposed below the horizontal plane of the oppositely-disposed cranks of said revoluble crank shafts, said downwardly-extending tamping members having pivotal mountings upon the oppositely-disposed cranks of the revoluble crank-shafts; webs upon the inner frame and disposed parallel upon different horizontal planes below the plane of and parallel with each revoluble crank-shaft, each of said webs having a connection with the parallel sides of the downwardly-extending tamping members upon one of the revoluble crank-shafts, to form guides; means to cause a revoluble movement of the horizontal end-shafts of the outer frame, and means to cause a horizontal movement of said webs.

14. A tamping machine, comprising a supporting-frame, a revoluble shaft mounted upon the supporting-frame and having crank arms formed thereon; downwardly-extending casings, each having a tamping-head removably mounted thereon, said downwardly-extending casings disposed below the horizontal plane of and pivotally mounted upon the crank-arms of the revoluble shaft.

15. A tamping machine, comprising a supporting-frame, a revoluble shaft mounted upon the supporting-frame and having crank-arms formed thereon; downwardly-extending casings each having a downwardly-extending tamping-head resiliently mounted thereon; said downwardly-extending casings disposed below the horizontal plane of and pivotally mounted upon the crank-arms of said revoluble shaft.

16. The combination of a supporting-frame, a revoluble shaft mounted upon the supporting-frame and having crank-arms thereon; downwardly-extending casings; said downwardly-extending casings having parallel sides and disposed below the horizontal plane of and pivotally mounted upon said crank-arms; a web mounted upon the supporting-frame and having a connection with the parallel sides of each of the downwardly-extending casings, to form guides; downwardly-extending tamping-heads; each of said downwardly-extending tamping-heads having a resiliently-mounted shank slidably seated within the downwardly-extending casings.

17. The combination with a movable crank-arm and a downwardly-extending casing having its upper end pivotally mounted upon the movable crank-arm, of a down-

wardly-extending plunger resiliently and slidably mounted within said downwardly-extending casing, and having a tamping-head removably mounted thereon.

18. The combination of an outer frame, an inner frame having parallel side-sills with track-wheels secured thereon, said inner frame being vertically movable upon the outer frame; a revoluble shaft upon the inner frame and having oppositely-disposed crank-arms thereon; downwardly extending sleeves pivotally mounted upon the oppositely-disposed crank-arms of said revoluble shaft; tamping-heads resiliently and slidably mounted within the downwardly-extending sleeves; a guide movable upon the inner frame and having a connection with the downwardly-extending sleeves; and an emergency or temporary trackway, comprising track-rails with horizontal connecting-rods therebetween and disposed parallel with the side-sills of the inner frame below the horizontal plane and upon the vertical plane of said track-wheels.

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

ANTON F. KELLNER.

Witnesses:

H. F. KELLNER,

HIRAM A. STURGES.