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TAMPING TOOL

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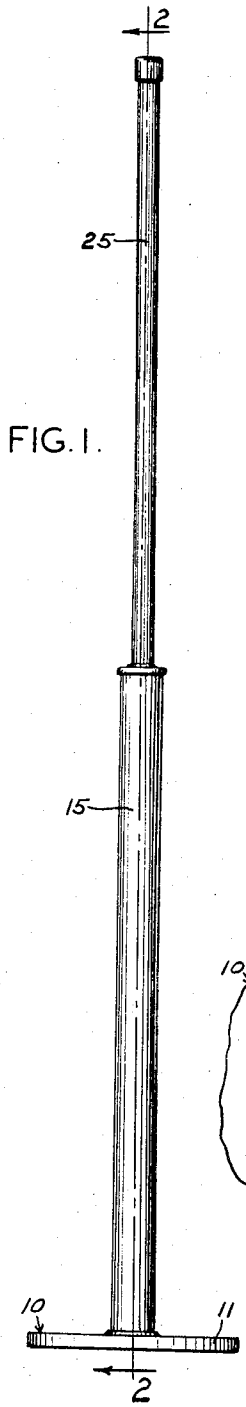


FIG. 1.

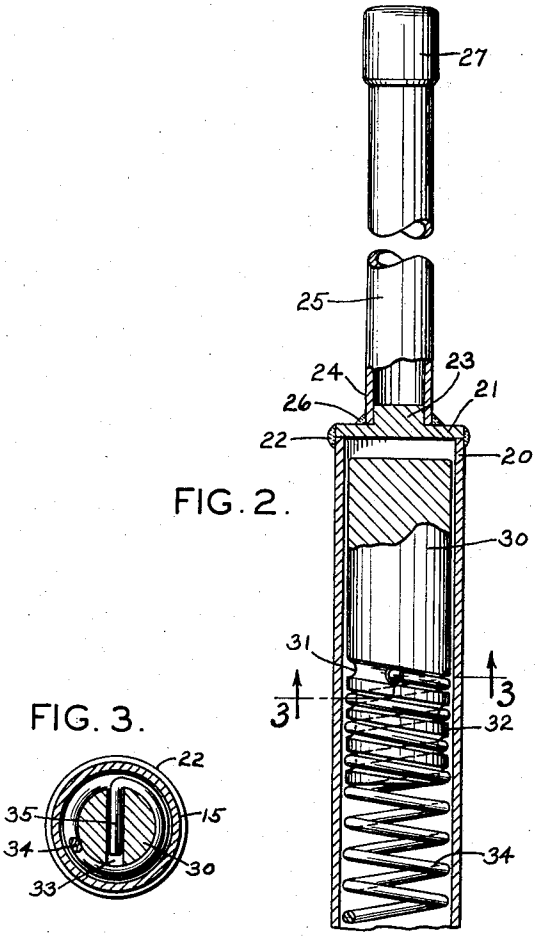
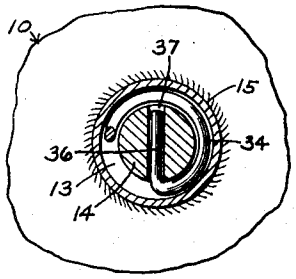


FIG. 2.

FIG. 3.

FIG. 4.



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TAMPING TOOL

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5 Claims. (Cl. 94—49)

This invention relates to improvements in a tamping tool and more particularly to improved means in a tool of this type adapted to realize a more efficient tamping action, and to facilitate manual manipulation.

It is an important object of this invention to provide a tamping tool that is adapted to deliver a secondary blow to the substance being tamped. Such action and functional result is achieved by the provision of a hammer carried by a load spring connected to the tool base, the hammer being adapted to move downwardly under its inertia after primary tamping impact of the tool base, whereby to compress the spring and transmit a percussive blow to the tool base, and hence to the tamped substance.

Another important object is realized by the connection and structural arrangement of the hammer and cooperating load spring in that the hammer is urged upwardly under loading of the spring after deliverance of the secondary blow, whereby to provide an automatic lifting action to the base, and hence to the entire tool subsequent to tamping impact of the tool.

An important objective is achieved by means in a tool of this type which affords a secondary percussive tamping below, and subsequently assists in lifting the tool for further actuation.

Still another important object is realized by the tamping tool by the provision of means that permits the tool to be manipulated up and down in regular rhythm, the means assisting in the lifting of the tool, and in delivering a secondary percussive blow upon tamping impact.

Another important object of the invention is to realize a tamping tool that is simple, durable and dependable in construction, easy to assemble and economical to manufacture.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a side elevational view of the tamping tool;

Fig. 2 is an enlarged, fragmentary view, partly in cross section, as seen along line 2—2 of Fig. 1 with the hammer in its uppermost position;

Fig. 3 is a cross sectional view of the tamping tool as seen along staggered line 3—3 of Fig. 2, and

Fig. 4 is a fragmentary view, partly in cross section, as seen along staggered line 4—4 of Fig. 2.

Referring now by characters of reference to the drawing, it is seen that the tamping tool consists of a base generally indicated at **10**, which may be of any desired shape or configuration. In the embodiment shown, the base **10** consists of a circular horizontal plate **11** having a lower tamping surface **12**. Formed centrally of plate **11** is an integral boss **13** that projects upwardly, the boss **13** including an uppermost reduced shoulder portion **14**. The boss **13** and reduced shoulder portion

14 are of circular cross section as is shown best in Fig. 4.

A vertical, elongate tubular element **15**, constituting a casing or housing for mechanism the purpose and structure of which will be later described in detail, is carried on base **10**. The tubular element **15** has its lower end **16** located about circular boss **13** and seated on plate **11**. The tubular element **15** is fixedly secured to plate **11** by weld **17**. From Fig. 2 it is seen that circular boss **13** and reduced shoulder portion **14** extend upwardly into the lower end **16** of tubular element **15**. The circular periphery of boss **13** closely interfits the internal diameter of tubular element **15**, while the circular periphery of reduced shoulder portion **14** is laterally spaced from tubular element **15** for reasons which will become apparent in the subsequent detailed description of the component parts of the tamping tool.

The upper end **20** of tubular element **15** is closed by a closure cap **21** seated thereon. This closure cap **21** is circular in cross section to conform substantially with the external diameter of tubular element **15**, and is secured thereby by welding bead **22**. The closure cap **21** includes an integral, upstanding circular boss **23** that extends into and closely interfits the lower end **24** of elongate vertical pipe **25**, the pipe **25** constituting a handle that may be conveniently utilized for manipulating the tamping tool. The handle pipe **25** is fastened to closure cap **21** by a peripheral weld **26**. The uppermost end of handle pipe **25** is closed by a cap element **27**.

Disposed within tubular element **15** is a movable hammer **30** having a spiral groove **31** formed in the peripheral surface of the lower portion **32** of hammer **30**. A transverse recess **33** (Fig. 3) is formed in hammer **30** and communicates with spiral groove **31**.

Located in tubular element **15** between hammer **30** and tamping plate **11** is a load spring **34**. The spiral coils of the upper end of the load spring **34** are located and retained in spiral groove **31** of hammer **30**. As is shown in Fig. 3, an end portion **35** of spring **34** is abruptly bent and disposed in transverse recess **33** in order to prevent unintentional and accidental disengagement of spring **34** from hammer **30**.

The lower end of load spring **34** is located about reduced shoulder portion **14**, as is best shown in Figs. 2 and 4. It is now apparent that reduced shoulder portion **14** is spaced from tubular element **15** to permit the endmost coils of spring **34** to be received therebetween. A lowermost end portion **36** of spring **34** (Fig. 4) is abruptly bent and disposed in transverse recess **37** formed in reduced shoulder portion **14** to fasten securely the lower end of load spring **34** to base **10**.

In operation, the tamping tool is gripped by handle pipe **25**, and is lifted manually to a raised position. Then, the tool is brought downwardly with force so as to bring the base **10** into tamping impact wtih the substance being tamped. Immediately upon impact of base **10** as described above, the hammer **30** continues downwardly in tubular element **15** due to its inertia, and acts to compress load spring **34**. The hammer **30** at the end of its downward movement delivers and transmits, through load spring **34**, a secondary percussive blow to tamping base **10**. It is seen that this secondary percussive blow is responsive to the inertia of hammer **30**.

After hammer **30** is moved to its lowermost position to deliver a secondary blow to base **10**, and hence to the substance being tamped, the hammer **30** is urged upwardly under the compressive loading of spring **34**. The hammer **30** in moving to its uppermost position in tubular element **15** transmits through load spring **34** a lifting action to base **10**, and hence to the tamping tool considered as a

whole. This lifting action enables the person manipulating the tamping tool to lift the tool to a raised position quickly and easily, since a considerable portion of the weight of the tool is compensated for by such lifting action. The tool may then be brought downwardly to deliver another tamping blow during which the cycle of operation of hammer **30** and load spring **34** is repeated as described above.

The closure cap **21** is located above hammer **30** a distance so as to be spaced from hammer **30** at all times. In other words, the hammer **30** does not abut or engage closure cap **21** when hammer **30** is moved to its uppermost position by load spring **34**. The spring **34** may be selected to be of a strength to permit compression under hammer inertia upon downward stroke of the tool, and to permit expansion to urge hammer **30** upwardly after delivering the secondary percussive blow, and yet be of such a strength to prevent hammer **30** from engaging closure cap **21**.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

I claim as my invention:

1. In a tamping tool, a base, an elongate tubular element fixedly secured to said base, a compressible coil spring disposed in said tubular element, a handle fixedly secured to said tubular element adapted for raising and lowering said tool, a hammer located in said tubular element for reciprocal movement in a vertical direction, the hammer being free of direct attachment to said tubular element, the coil spring having one end connected to said hammer, and having the opposite end anchored to said base, the hammer moving upwardly under spring loading so that said hammer transmits through said spring a lifting action to said base and tool in response to hammer inertia, whereby to facilitate manual lifting of said tool.

2. In a tamping tool, a lower base, a tubular element fastened to said base, a handle fastened to said tubular element, a compressible coil spring disposed in said tubular element, a hammer located in said tubular element above said coil spring, said tubular element constraining said hammer to reciprocal movement in a vertical direction, the hammer being free of direct attachment to said tubular element, the spring having its upper end connected to said hammer, and having its opposite lower end operatively connected to said base, the hammer being movable downwardly against the loading of said spring after said base is brought into striking engagement with the surface to be compacted, the hammer then being movable upwardly under spring loading so that said hammer transmits through said spring a lifting action to said base and tool in response to its upwardly moving inertia.

3. In a tamping tool, a base, an elongate tubular element fixedly secured to said base, a compressible coil spring disposed in said tubular element, a handle fixedly secured to said tubular element, a hammer located in said tubular element, the hammer being free of direct attachment to said tubular element, the coil spring having one end operatively connected to said base, the hammer being connected to and carried by the opposite end of said coil spring, the hammer being movable in a direction against

the loading of said spring after said base is brought into striking engagement with the surface to be compacted, thereafter the hammer moving in a direction under the loading of said spring so that said hammer by its moving inertia transmits through said spring a lifting action to said base and hence to the tool.

4. In a tamping tool, a tamping base, an elongate, vertical tubular element fastened to said base, a compressible coil spring disposed in said tubular element, the spring having its lower end fastened to said base, a hammer located in said tubular element, the hammer being free of direct attachment to said tubular element, said hammer being fastened to and carried by the upper end of said spring, a handle fixed on said tubular element for raising and lowering said tool, the hammer being movable downwardly against the loading of said spring after said base is brought into striking engagement with the surface to be compacted, said hammer transmitting through said spring a secondary additional blow to said base, said hammer being movable upwardly under the loading of said spring after transmittal of said secondary blow so as to effect through said spring a lifting action to said base by its upwardly moving inertia, whereby to facilitate lifting of said tamping tool.

5. In a tamping tool, a tamping base, an elongate, vertical tubular element located above said base, said tubular element having a lower end fastened securely to said base, said base having a reduced shoulder portion extending into said lower end of said tubular element, said shoulder portion being spaced laterally from said tubular element, said tubular element having an open upper end, a closure element fixedly secured to said upper end of the tubular element, a handle fixedly secured to said closure, the handle being adapted for raising and lowering said tool, a compressible coil spring disposed in said tubular element, said spring having a lower end arranged about and fastened to said reduced shoulder portion, a hammer located in said tubular element, the hammer being free of direct attachment to the tubular element, the spring having an upper end wrapped around and fastened to said hammer, the hammer being movable downwardly against the loading of said spring after said base is brought into striking engagement with the surface to be compacted, said hammer transmitting through said compression coil spring a blow to said base, and hence a secondary blow to said surface, the hammer being movable upwardly under the loading of said coil spring after transmittal of said secondary blow, said hammer transmitting through said coil spring a lifting action to said base by its upwardly moving inertia, whereby to facilitate lifting of said tool, the closure being arranged so as to be spaced from said hammer at all times.

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