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FLOOR-LAYING TOOL  
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2,710,166

Fig. 1

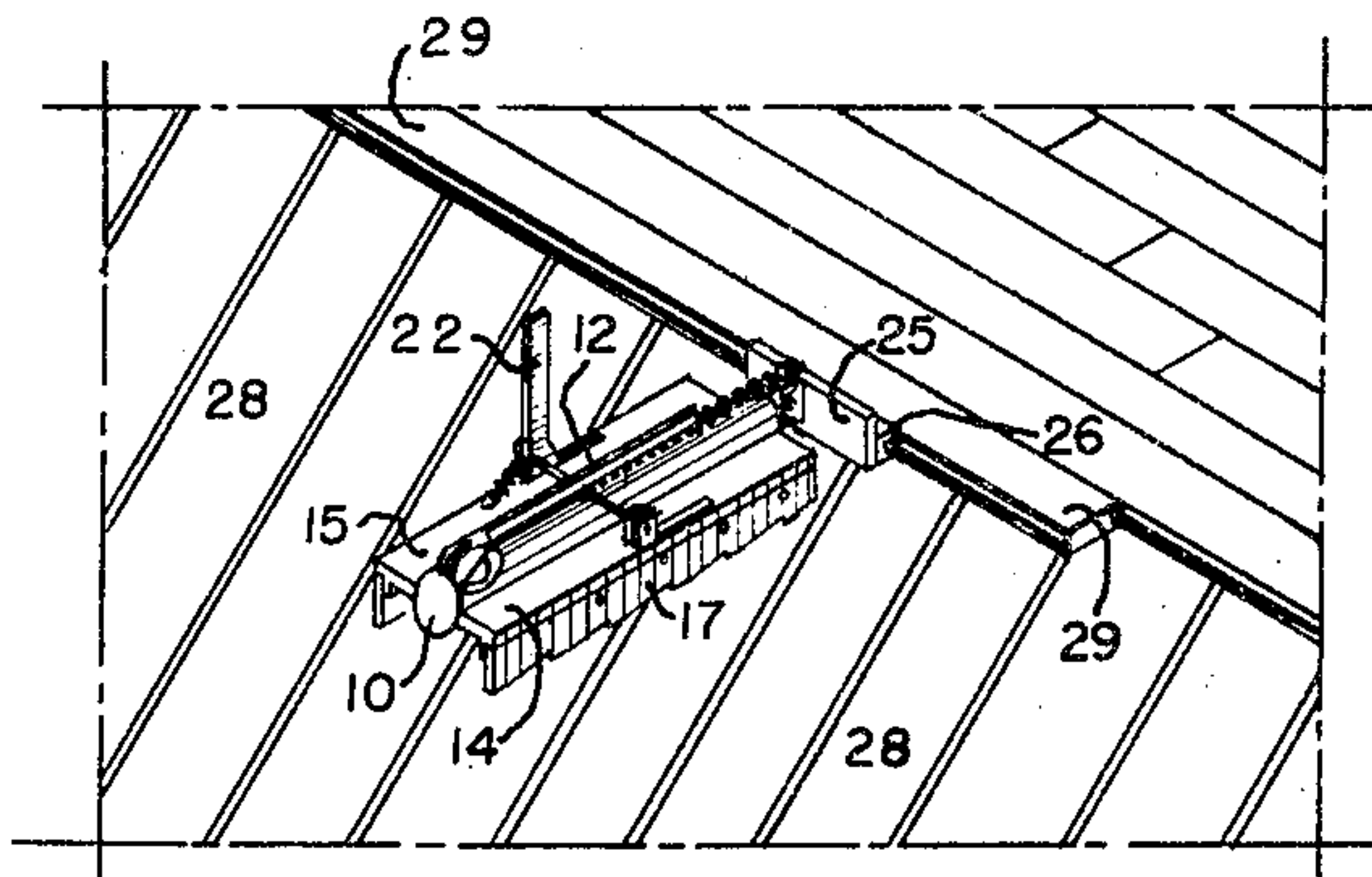


Fig. 2

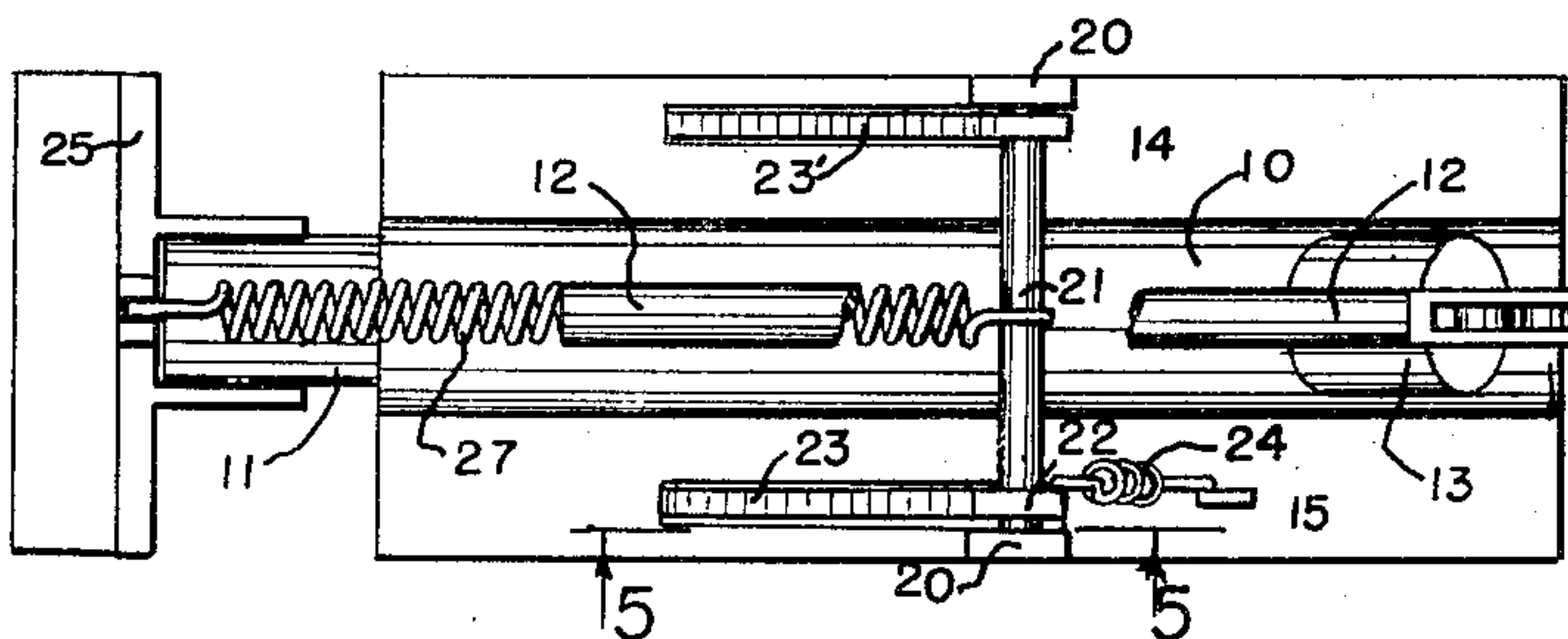


Fig. 3

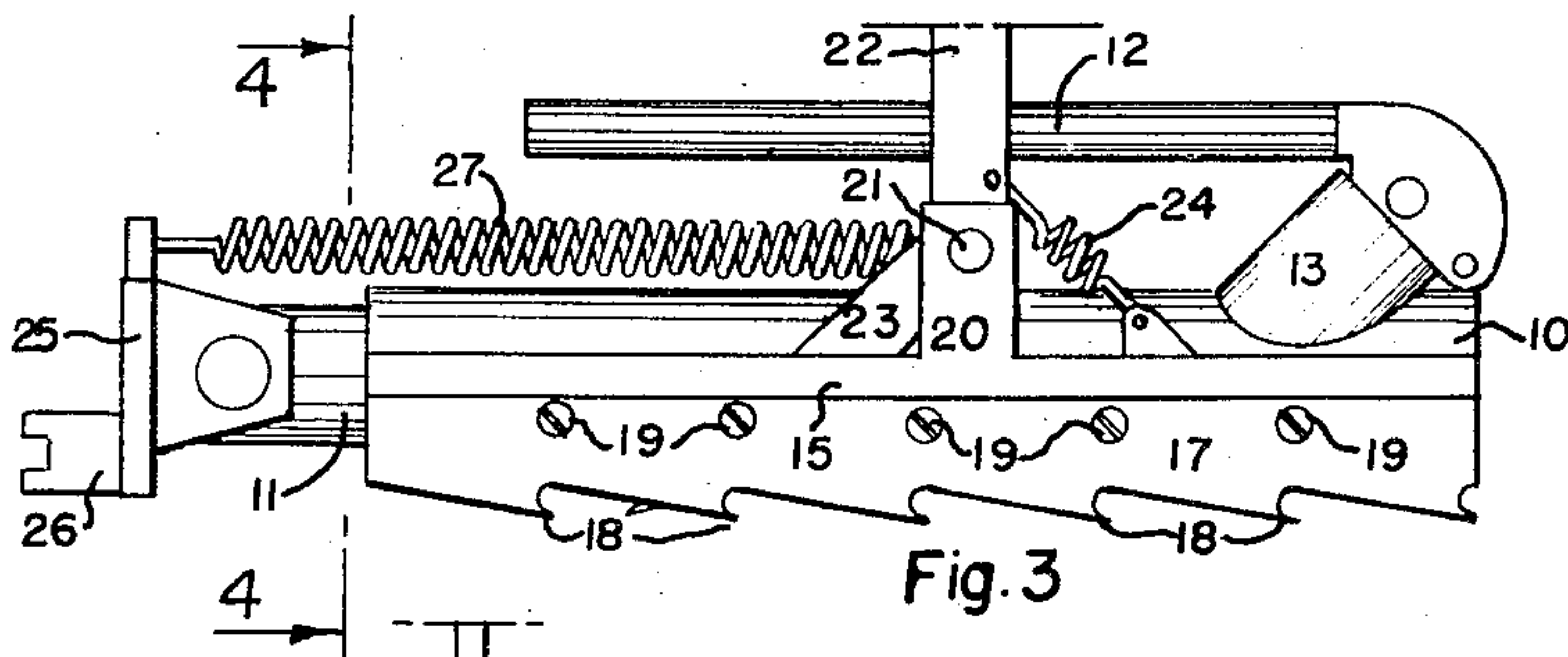


Fig. 4

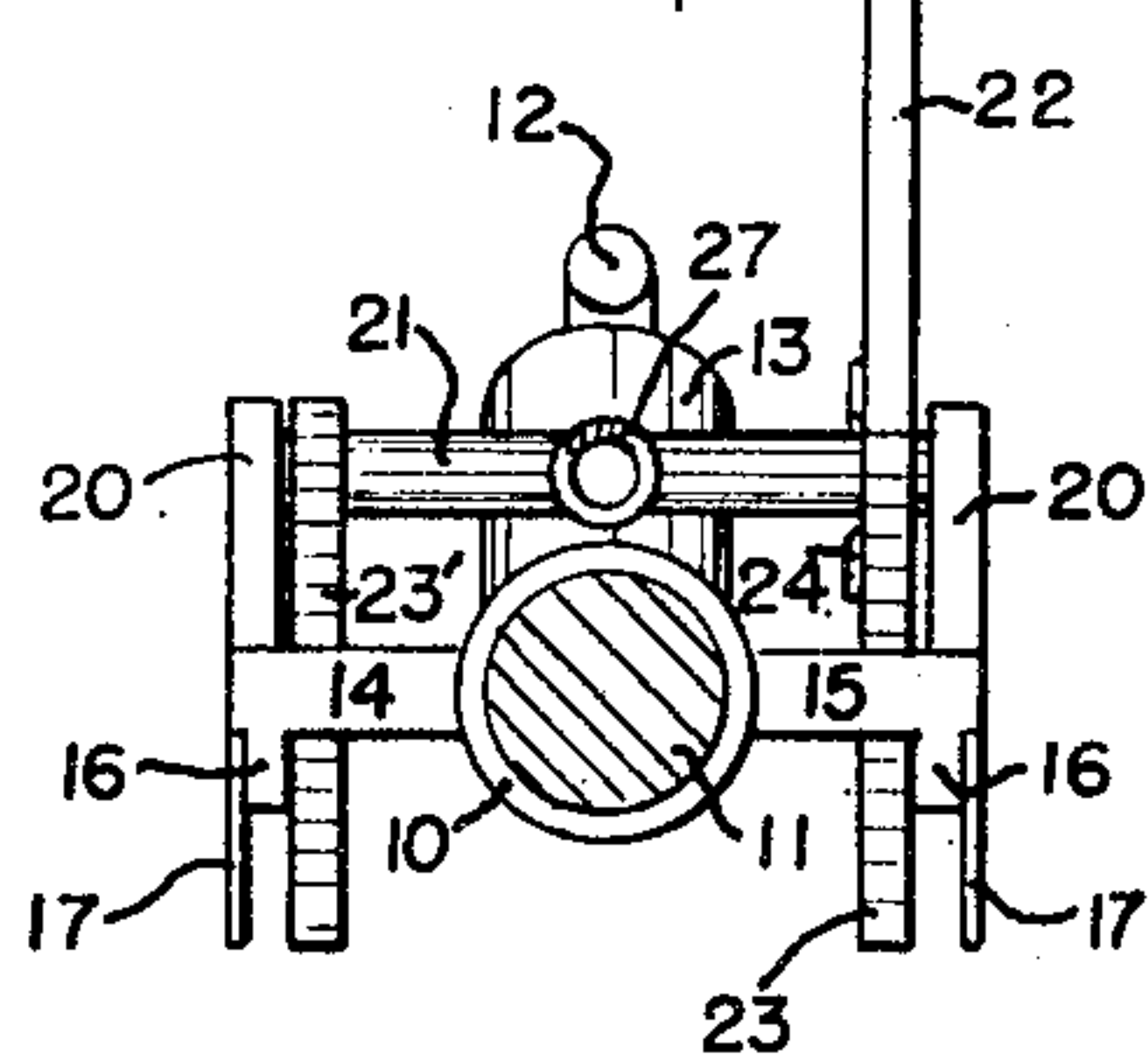
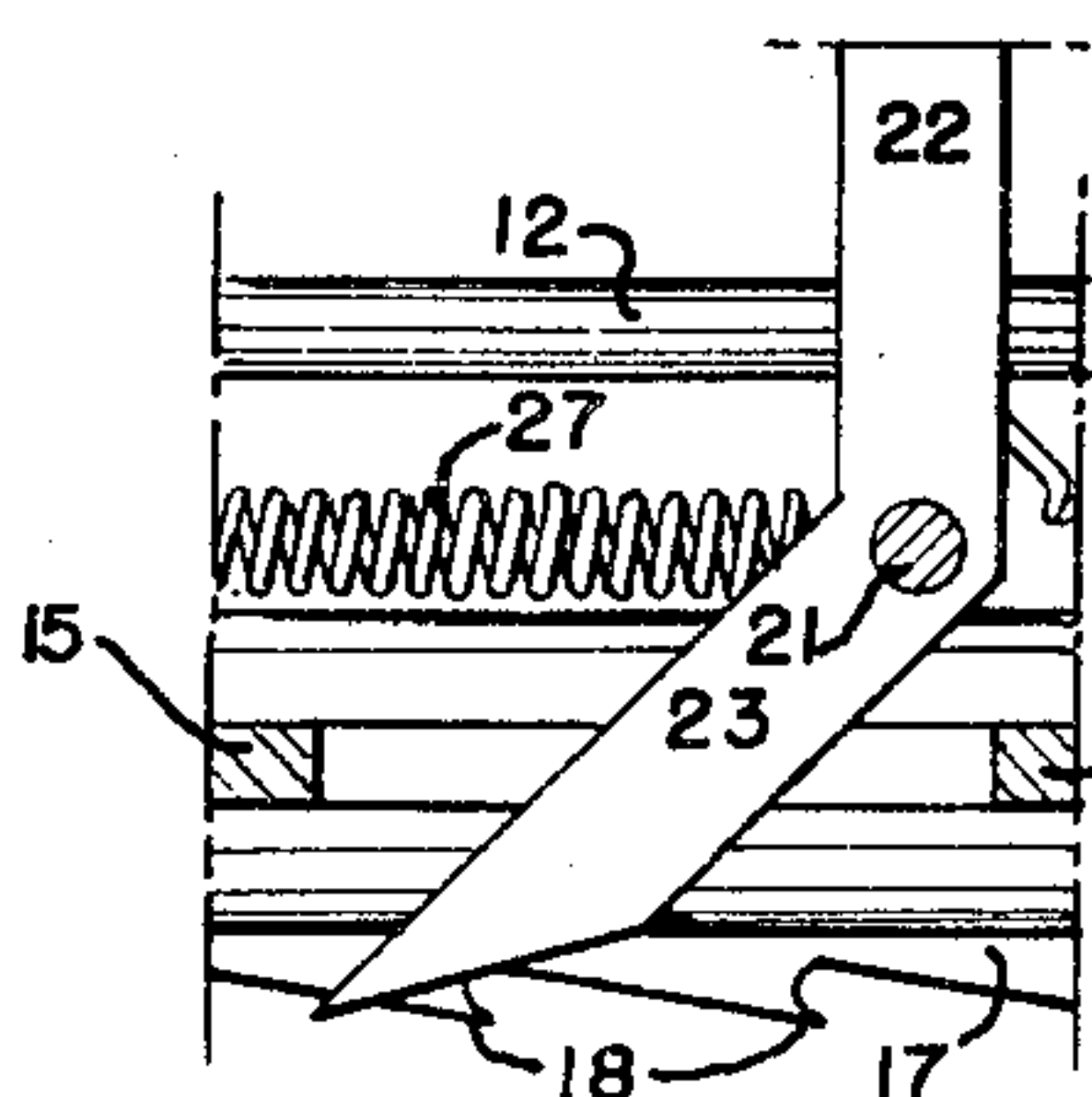


Fig. 5



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2,710,166

## FLOOR-LAYING TOOL

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5 Claims. (Cl. 254—11)

This invention relates to tools and facilities advantageously employable in the fitting and laying of flooring boards, and more particularly to means for positively interfitting and holding in place successive elements of tongue-and-groove flooring during the laying thereof over and against a sub-floor, and has as an object to provide an improved flooring clamp characterized by convenience and facility of use.

A further object of the invention is to provide an improved construction and operative interrelation of elements constituting a flooring clamp employable in engagement with a sub-floor to facilitate the laying of matched flooring thereover.

A further object of the invention is to provide an improved flooring clamp susceptible of rapid and convenient operative positioning and manipulation.

A further object of the invention is to provide an improved flooring clamp retentive of pressure-imposing operative adjustment upon release from applied manipulative factors.

A further object of the invention is to provide an improved flooring clamp that is simple and inexpensive of manufacture in rugged, durable form, positive and efficient in operation, and effectively applicable to a wide range of particular uses.

The instant invention is a development from and a novel and advantageous structural reorganization of the principles characterizing my United States Patent No. 2,588,401, issued on March 11, 1952.

With the foregoing and other objects in view, my invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawing, in which—

Figure 1 is a somewhat diagrammatic, perspective view of a typical embodiment of the invention as positioned and arranged for practical use.

Figure 2 is a top plan view, on a relatively enlarged scale and with a handle member broken away to disclose otherwise concealed arrangements, of the improved tool shown in Figure 1.

Figure 3 is a side elevation of the organization according to Figure 2.

Figure 4 is a cross section taken substantially on the indicated line 4—4 of Figure 3.

Figure 5 is a fragmentary, detail section taken substantially on the indicated line 5—5 of Figure 2.

It is wide-spread, conventional practice to construct buildings of many types and sizes with board sub-floors fixed in diagonal or perpendicular traversing relation to the usual floor joists and to subsequently complete the desired finish floor by means of matched boards, generally edge tongued and grooved, laid over and secured to the sub-floor. A factor of consequence in the development of high quality finish floors is the close, intimate edge matching of adjacent boards for the elimination of open cracks and seams, and practical control of said factor is aggravated by irregularities and inequali-

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ties inevitably characterizing the boards to be matched as a consequence of warping, twisting, and inaccurate milling, hence pointing the desirability of means employable during laying of the finish floor to pressure-urge and clamp together the edges of the successively-laid boards as the same are positioned upon and nailed to the sub-floor, and the instant invention is directed to the provision of an operatively-positive, conveniently-employable facility of such character.

The improvement, as shown, is a unitary assembly of elements associated with and grouped about the straight cylinder 10 of a conventional-type, manually-operable, hydraulic or pneumatic ram or jack assembly having the usual stem or plunger 11 telescopically associated with said cylinder for extension and retraction through one end thereof. Typical of conventional such ram or jack assemblies, an operating handle member 12 is hinged at one end to the end of the cylinder remote from that intersected by the stem 11 to swing toward and away from said cylinder through an arc in a plane radially of the cylinder, said handle member 12 preferably being arranged to spacedly overlies the cylinder in substantial parallelism with the cylinder axis at the limit of its swing toward the ram assembly. The handle member 12 is connected with and for the actuation of the reciprocable element of a pressure pump assembly, designated generally by the numeral 13, serving the end of the cylinder remote from that intersected by the stem 11 in a conventional and well-understood manner effective to apply manipulations of said handle member about its hinge axis for the development of pressures within the cylinder 10 acting against and to relatively extend the stem 11; other manipulations of the handle member 12, such as rotation thereof about its axis, being conventionally availed of for retention or release of the stem-extending pressures developed within the cylinder. All of the foregoing construction is wholly conventional and is illustrated and briefly described but to typify the many commercial forms of manually-operable hydraulic or pneumatic ram or jack assemblies available for use in and as a primary element of the instant invention.

Adapting the typical ram or jack assembly to the purposes of the invention, complementary, essentially-identical plate strips 14 and 15 are fixed at their corresponding long edge margins to and longitudinally of opposite sides of the cylinder 10 in a length preferably equalling that of the cylinder and in a coplanar disposition determinative of a plate strip plane diametric of the cylinder and perpendicular to that containing the arc of handle member 12 swing. The outer, or free, long edge margin of each strip plate 14 and 15 is formed with a rib 16 therealong and outstanding perpendicularly from the face of the associated plate strip remote from the handle member 12 position, the outer faces of said ribs 16 being inset relative to their adjacent plate strip margins a distance equal to the thickness of like, marginally-toothed sheet strips 17 removably and replaceably engaged therewith, whereby to dispose outer faces of the mounted sheet strips in coplanar relation with the outer edge margins of the plate strips 14 and 15. It is the function of the sheet strips 17 to support the improved floor clamp unit in position of practical use on a sub-floor, as shown in Figure 1, and to hold the unit against sliding on the sub-floor in reaction to the pressure application incident to unit use, wherefore said sheet strips 17 are expediently formed of hard metal capable of taking and holding a sharpened edge or point, such as steel, are symmetrically toothed along their corresponding long edge margins to provide a spaced series of sharp points 18 correspondingly directed and inclined relative to the sheet strip length, are finished to a straight long edge margin paralleling the line of the points 18 and adapted to abut the edge projection of



either plate strip 14 or 15 when the sheet strip is mounted in face engagement with the outwardly-directed surface of the associated rib 16, and are provided with a series of spaced holes inwardly adjacent and along such straight long edge margin wherethrough screws 19 may threadedly engage with the associated rib 16 to removably and replaceably secure the said strips 17 to and in the desired relationship with the said ribs. The sheet strips 17 are mounted on the ribs 16 of the plate strips 14 and 15 to dispose their points 18 in an inclination away from the stem 11, thus to provide that any tendency of the cylinder 10 and its associated elements to slide on a sub-floor engaged by said points in reaction to pressures applied through said stem will result in penetration of the sub-floor by said points for enhanced resistance to such sliding and consequent development of an anchored abutment on which pressures within the cylinder 10 may react for extension of the stem 11. As should be apparent, the sheet strips 17 may be removed for convenient conditioning of their points 18, said strips may be interchanged at either side of the assembly, and either or both said strips may be replaced at need, thus assuring efficient functioning of the unit elements most subject to wear and damage throughout a long practical use life of the unit.

Disengagement of the points 18 from their penetration on the sub-floor to release the unit for shift to a different use position is expedited and facilitated through the provision of a lifter carried by and rockably associated with the unit. As a mounting for the lifter, like ears 20 fixedly and perpendicularly upstand from and adjacent the outer long edge margins of the plate strips 14 and 15 in opposition to the ribs 16 and in registration transversely of the unit intermediate the unit ends. The ears 20 rise well above the cylinder 10 and are apertured near their upper ends for the journaled reception of the ends of a shaft 21 thereby mounted to transversely bridge the unit above the cylinder 10. Inwardly adjacent one of the ears 20, a manipulating lever 22 is fixed to and upstands radially from the shaft 21, whereby to manually oscillate said shaft in its journal mounting, and an extension 23 from the lower end of said lever 22 passes in angular relation with said lever through an accommodating slot in the plate strip 15 to terminate in a point at the plane common to the sheet strip points 18 and offset from the shaft 21 position in a direction toward the cylinder 10 and intersected by the stem 11. A lifter element 23', in all respects analogous to the extension 23, is fixed to the shaft 21 inwardly adjacent the ear 20 remote from the lever 22 and is accommodated through a slot in the plate strip 14 in spaced parallelism with said extension 23, so that when the free end of the lever 22 is swung toward the stem 11 end of the unit the shaft 21 is rocked to engage the free ends of the extension 23 and element 23' with the sub-floor in a manner to retract the points 18 from their sub-floor penetration. To normally hold the lifter points in appropriate position during shifting and placing of the unit, a retractile spring 24 connects between the lever 22 and a point of the plate strip 15 at the side of the shaft 21 away from which the extension 23 inclines.

Conditioning the unit for its intended use, a pressure block 25 is engaged, preferably removably and replaceably, with the end of the stem 11 exterior to the cylinder 10 to dispose the outer face of said block perpendicular to the stem axis, said block outer face being of a depth to substantially close at its lower margin against the sub-floor with which the sheet strip points 18 engage and carrying a laterally-grooved adapter 26 outstanding therefrom for coaction with the tongue edge of a floor board. For retraction of the stem 11 and pressure block 25 from positions of extension relative to the cylinder 10 when the cylinder pressure is relieved, a retractile spring connects between the shaft 21 and an upper margin of said block 25 longitudinally and exteriorly of the cylinder.

In the practical use of the improvement, the unit is placed upon and pressed into engagement of its sheet

strip points 18 with the boards of a sub-floor 28 in the manner shown in Figure 1, the grooved adapter 26 being presented to and parallel with the tongue edge of the flooring board 29 to be acted upon and the unit being so spaced from the edge of the board as to provide an effective range of stem 11 and block 25 travel outwardly and away from the unit through the agency of the ram or jack assembly comprised in the unit. With the elements so disposed and positioned, the conventional pressure release control of the ram or jack assembly is set to retain pressure within the assembly and the handle 12 is oscillated in a customary manner to develop pressure in the cylinder 10 effective to extend the stem 11 relative to the cylinder, which extension of said stem acts to shift the block 25 and its adapter 26 outwardly away from the unit and to crowd the engaged flooring board 29 into intimate marginal engagement with the previously-laid board, in which relation the so-clamped board is automatically held while being nailed in place by virtue of the pressure obtaining within the cylinder 10, thus freeing the operator's hands for nailing purposes. A given board having been secured in place, the conventional pressure release control is actuated to relieve the cylinder 10 of its pressure and the spring 27 then acts to retract the stem 11 and block 25 toward the unit and to free the adapter 26 from the previously-engaged flooring board, whereafter manipulation of the lifter by means of the lever 22 retracts the points 18 from their engagement with the sub-floor 28 and frees the unit for shift to a new position of use.

Since changes, modifications, and variations in the form, construction, and arrangement of the elements shown and described may be had without departing from the spirit of my invention, I wish to be understood as being limited solely by the scope of the appended claims, rather than by any details of the illustrative showing and foregoing description.

I claim as my invention:

1. A floor-laying tool comprising a manually-operable ram assembly characterized by a cylinder and a stem extensible and retractible through one end thereof, complementary plate strips fixedly outstanding from and longitudinally of the ram cylinder in a common plane substantially diametric of the cylinder to similarly terminate in free outer margins paralleling the axis of the ram assembly, like sheet strips removably and replaceably engaged with the plate strip outer margins to similarly outstand in spaced parallel relation perpendicular to the plate strip plane, toothed, floor-engaging free lower margins on the sheet strips defining a plane exteriorly clearing the ram cylinder, a grooved pressure block secured to the exterior end of the ram stem, and means selectively manipulable in articulated relation with said plate strips to elevate the tool relative to a supporting floor for retraction of the sheet strip teeth from penetrative engagement with said floor.

2. The organization according to claim 1, wherein each plate strip is formed with an integral rib perpendicularly outstanding from the face thereof remote from the ram-manipulating means inwardly adjacent the plate strip outer margin, the upper edges of the sheet strips exteriorly overlie said ribs in abutting relation with the adjacent plate strip outer margins, and said sheet strips are secured to said ribs by screws engaging through said strips and with said ribs.

3. The organization according to claim 1, wherein said pressure block is associated with the ram stem for reciprocation therewith and to dispose the lower margin of the block closely adjacent and in clearing relation above a floor wherewith the tool is engaged, and the groove of said block opens outwardly and transversely of the tool parallel to the plate strip plane adjacent the block lower margin.

4. The organization according to claim 1, wherein each of the plate strips is formed with a slot therein and the



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means manipulable to elevate the tool from a supporting floor comprises a shaft rotatably mounted transversely of and above the ram assembly in ears fixedly upstanding from outer margins of the plate strips, a lever fixedly upstanding from and radially of one end of said shaft, an extension of said lever accommodated through the slot of the adjacent plate strip in an inclination toward the extensible and retractible end of the ram stem and terminating adjacent the plane of the sheet strip toothed margins, a lifter element similar to said lever extension fixed to the other end of said shaft and accommodated through the slot of the other plate strip in an inclination spacedly paralleling said lever extension, and a spring between said lever and a fixed point of the adjacent plate strip yieldably urging said lever to a position of lever extension and lifter element elevation relative to the sheet strip free margin plane.

5. In a floor-laying tool characterized by a manually-operable ram assembly having a cylinder and a stem extensible and retractible through one end thereof, complementary plate strips, each formed with a slot therein, fixedly outstanding from and longitudinally of the said cylinder in a common plane substantially diametric thereof to similarly terminate in free outer margins parallel-

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ing the axis of the ram assembly, like sheet strips removably and replaceably engaged with the plate strip outer margins to similarly outstand in spaced parallel relation perpendicular to the plate strip plane, floor-engaging free margins on said sheet strips toothed in an inclination of points away from the exterior end of the ram stem and defining a plane exteriorly clearing the ram cylinder, a pressure block secured to the exterior end of the ram stem for reciprocation with the latter adjacent the plane of the sheet strip free margins, a groove transversely of said block outer face adjacent the block lower margin, a shaft rotatably journaled on the plate strips transversely of and above the ram cylinder, a lever fixedly upstanding radially from one end of said shaft, and lifter elements fixedly inclining from said shaft toward the ram stem exterior end in accommodation through the slots of the plate strips.

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