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Goodman

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[54] **PIPE TIGHT ALL**

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[51] **Int. Cl.**..... **B25b 17/00,** B25b 21/00

[58] **Field of Search**..... 81/57.11, 57.12, 81/57.13, 57.14, 57.17, 57.29

[56] **References Cited**

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[57] **ABSTRACT**

A wrench for grasping pipes and tightening the same, the wrench including a hollow handle with an electric motor therein that is powered externally by means of an extension cord and plug leading from the handle, the motor driving rotationally a pair of toothed rollers between which there is a saddle into which a pipe is fitted for being rotated by the toothed rollers, the pipe being held tightly against the two toothed rollers by means of a swivel linked belt that carries freely rotatable rollers bearing against the surface of the pipe.

3 Claims, 5 Drawing Figures

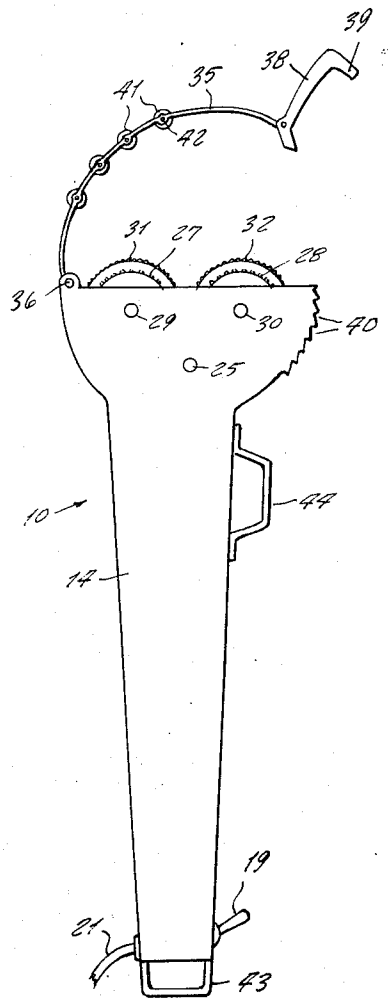


Fig. 1

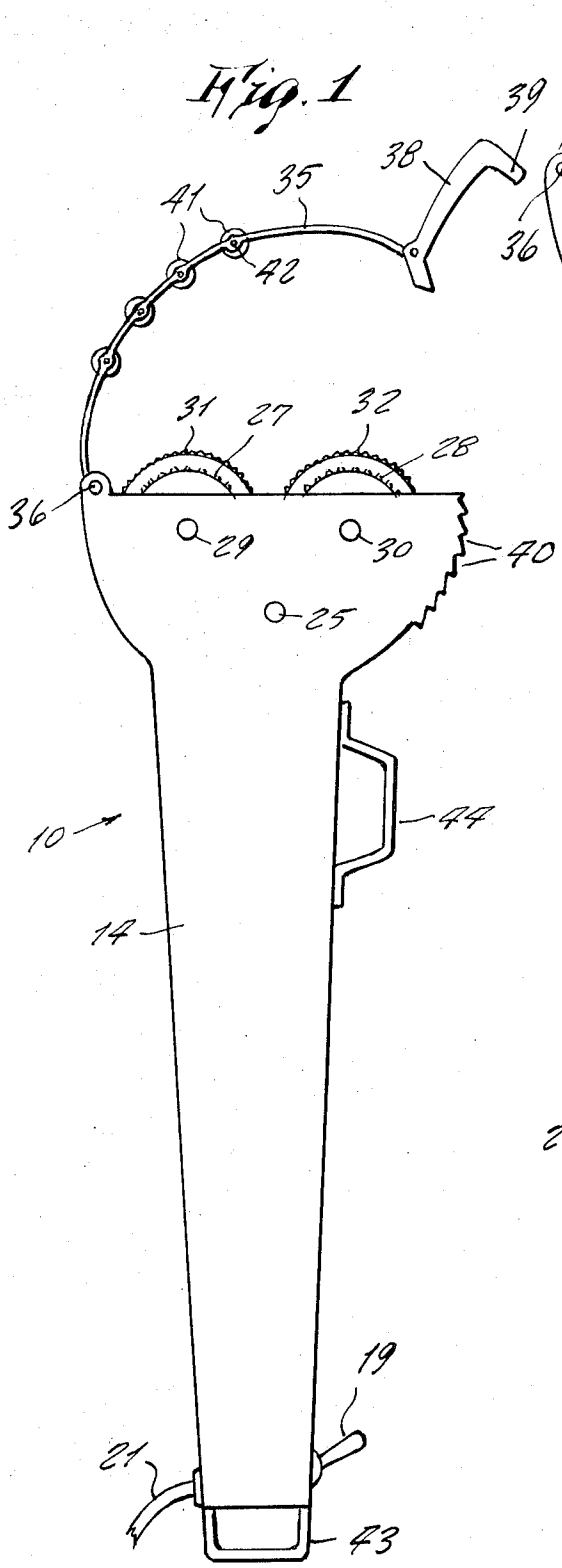
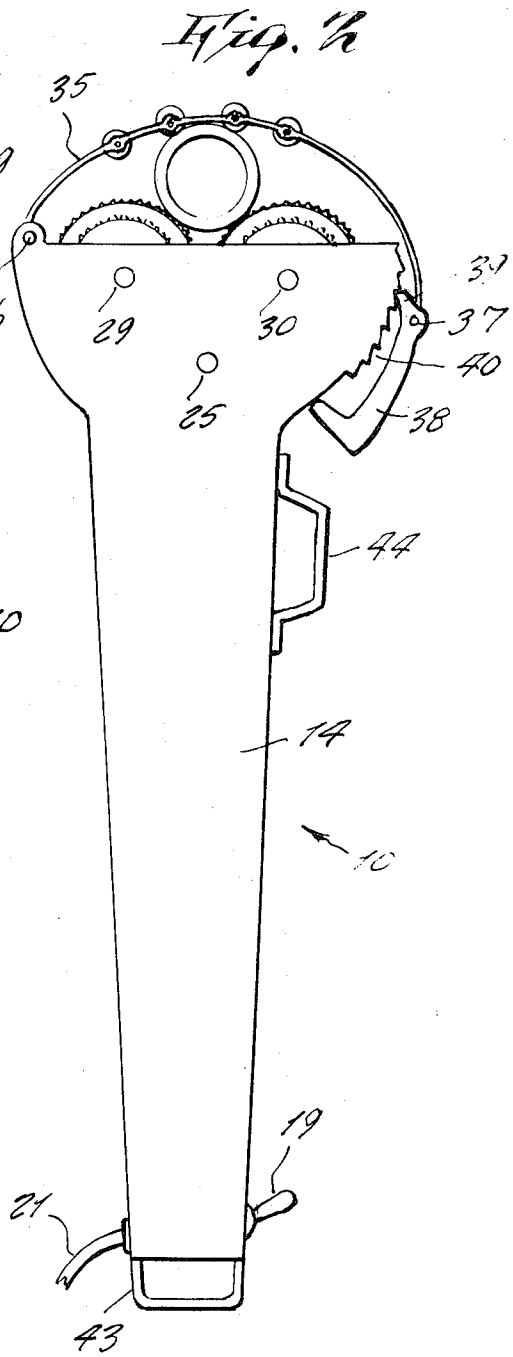


Fig. 2



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Fig. 4

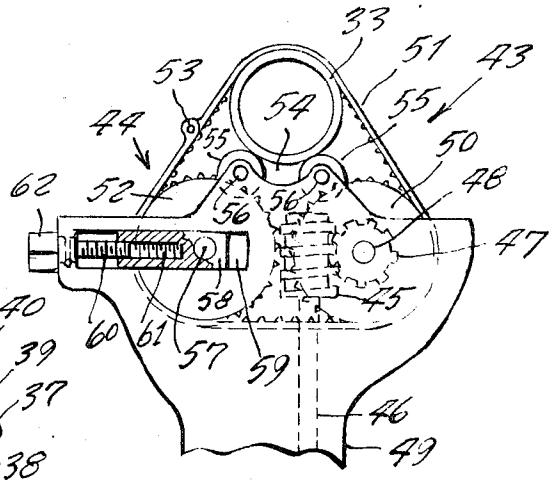
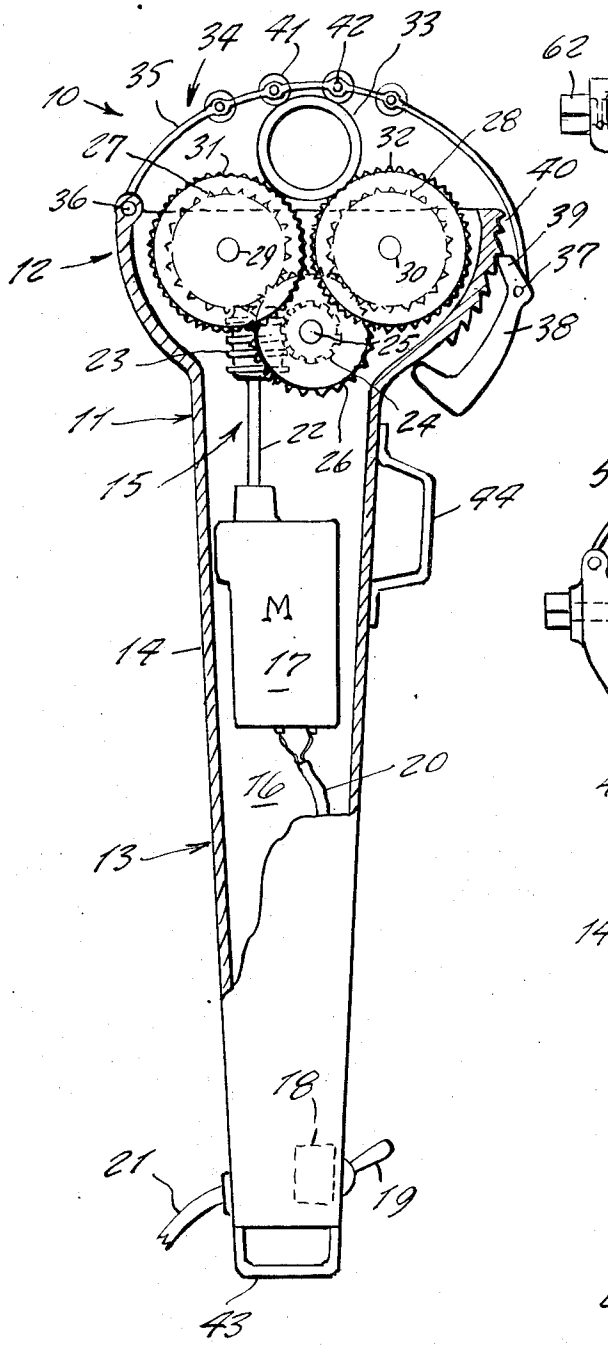


Fig. 3



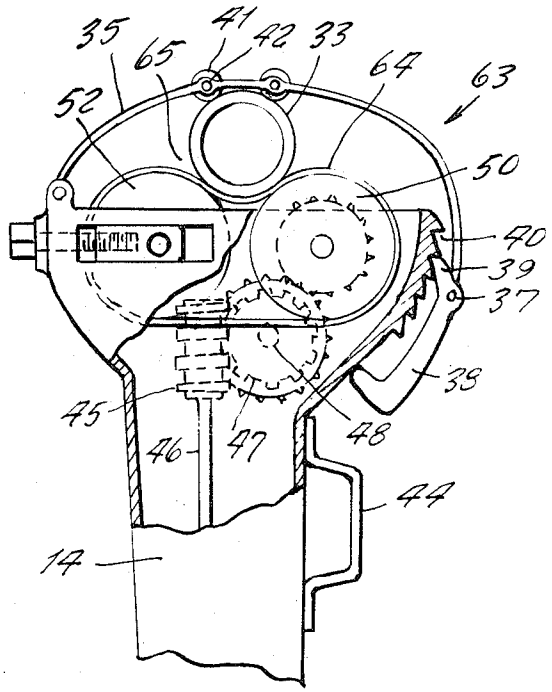


Fig. 5

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PIPE TIGHT ALL

This invention relates generally to hand tools. More specifically the present invention relates to wrenches such as are used for providing leverage in gripping objects such as pipes.

A principal object of the present invention is to provide a wrench that is specifically designed for grasping screw pipes and which may accordingly be used for tightening or loosening screw pipe connections.

Another object of the present invention is to provide a specific wrench termed as a pipe tight all, and which is designed to operate five or six times as fast as a conventional wrench.

Still another object of the present invention is to provide a pipe tight all which is electrically driven so as to minimize the physical effort for an operator in tightening or loosening a screw pipe connection.

Yet another object of the present invention is to provide a pipe tight all which is designed for handling screw pipe up to two inches in diameter.

Other objects of the present invention are to provide a pipe tight all which is simple in design, inexpensive to manufacture, rugged in construction, easy to use and efficient in operation.

These and other objects will be readily evident upon a study of the following specification and the accompanying drawings wherein:

FIG. 1 is a side elevation view of the present invention and shown in an open position;

FIG. 2 is a similar view thereof with a pipe secured therein;

FIG. 3 is a cross-sectional view taken in the same plane as FIGS. 1 and 2;

FIG. 4 is a fragmentary side elevation view showing a modified design of the invention wherein a toothed endless belt engages around the pipe so to give a larger frictional grasp thereof; and

FIG. 5 is a similar view shown partly in cross-section and illustrating still another modified design thereof wherein a larger frictional grasp is provided for the pipe on only one side thereof.

Referring now to the drawings in detail, and more particularly at this time to FIGS. 1 through 3, the reference numeral 10 represents a pipe tight all wrench, according to the present invention, wherein there is an assembly 11 which incorporates a working head 12 at one end of a longitudinally extending handle 13.

The head and handle comprise a hollow housing 14 which may be comprised of a pair of light housing shells secured together so as to contain a working mechanism 15 therebetween.

Within the interior of the handle 13, there is located an electric motor 17 and an electric switch 18. The electric switch 18 being provided with an outwardly extending switch lever 19. The motor 17 and the switch 18 are connected together by means of electrical wiring 20 and which also communicates with an electric extension cord 21 extending outwardly of the handle 13, and at its opposite end is provided with a male plug, not shown, for insertion into a female electric outlet socket for maintaining electrical power.

The motor 17 has a motor shaft 22 having a worm 23 secured thereto. The worm engages a worm gear 24 secured to a shaft 25 upon which there is also secured a first spur gear 26. The spur gear 26 toothingly engages a second and third spur gear 27 and 28 secured upon shafts 29 and 30 respectively.

Shafts 25, 29 and 30 are supported at their opposite ends within bearings formed in the housing 11 at the head end of the tool. The shafts 29 and 30 each has either a smooth or toothed roller 31 and 32 secured thereto.

A pipe 33 intended to be rotated by said present tool is seated in a saddle formed between the rollers 31 and 32 so that the peripheral sides of the roller engages the outerside of the pipe 33, as shown in FIG. 3.

In order to maintain frictional engagement of the pipe 33 with the surfaces of the rollers 31 and 32, there is provided a holding mechanism 34 comprised of a swivel link belt 35 which is supported pivotally free at its one end upon a pin 36 secured to the housing 11, the opposite end of the swivel link belt being connected pivotally free by means of a pin 37 to a vise lever 38, the lever 38 being provided with a tooth 39 selectively engageable with one of a plurality of locking grooves 40. The grooves 40 are integrally formed on the head 12 of the housing 11.

Along the swivel link belt 35 there are secured a plurality of transverse extending rollers 41 rotatably free and which serve to force the pipe 33 into the jaw or saddle between the rollers 31 and 32 so that the pipe 33 is in engagement with the rollers.

The rollers 41 are freely rotatable and supported upon pins 42. The present tool is provided with a convenient handle 43 comprised of a grasp handle or grasping bar for one hand of the operator, there being provided a second grasping bar 44 secured to the housing 11 relatively closer to the working head 12.

In operative use, it is now evident that a pipe 33 can be readily placed into the saddle between the rollers 31 and 32 after which the swivel link belt is pivotally closed over the opposite end of the pipe 33 so to urge the same against the rollers 31 and 32.

This is accomplished by simply locking the tooth 39 of the vise lever 38 in the appropriate locking groove 40, and then flipping the switch lever 19, thus causing the motor 17 to drive the mechanism 15 which thus causes the pipe 33 to rotate while the operating is holding the handle 13 of the tool steadily.

Thus there is provided a pipe tight all which saves on effort by utilizing electrical power and which thus permits a workman to accomplish five to six times as much work as a conventional pipe wrench.

Referring now to FIG. 4 of the drawing, there is shown a pipe tight all 43 which includes a mechanism 44 wherein there is a worm 45 secured on a motor shaft 46, the worm engaging a worm gear 47 secured on the shaft 48 supported in bearings formed on the housing 49. The shaft 48 has a toothed roller 50 secured thereto, the toothed roller 50 having an endless toothed belt 51 passed therearound and also around a second toothed roller 52.

The endless toothed belt 51 may however be opened by means of removing a transverse pin 53, thus separating the opposite ends of the belt 51 so to permit extending the belt around a pipe 33 which is intended to be rotated during a screwing or unscrewing operation.

The pipe 33 rests in a saddle 54 formed between two rollers 56 mounted rotatably free upon pins 56 secured to opposite sides of the housing 49.

It is to be noted that the teeth of the belt 51 bear against the outer side of the pipe 33 for frictionally grasping the same and rotating it. In order to accomplish a firm hold of the teeth against the pipe 33, the

belt is tightened by means of the roller **52** being freely rotatable about a pin **57** carried in a slide block **58** slideable within a slot **59** of the housing **49.**

The block **58** is selectively slideable by means of a screw **60** threadingly engaged within a threaded opening **61** of the slide block **58.** Thus by rotating the head **62** of the screw **60,** the slide block **58** can be moved outwardly so to move the roller **52** outwardly and thus provide tension on the belt **51.**

Thus one modified form of the invention is shown so to provide increased frictional grasp by the mechanism upon the pipe **33** so to cause the pipe to rotate.

Referring now to FIG. **5** of the drawing, there is shown another modified design of pipe tight all **63** which is a cross between the structure shown in FIG. **3** and the structure shown in FIG. **4** and which accordingly incorporates the driving mechanism illustrated in FIG. **4** and which incorporates the swivel link belt holding structure shown in FIG. **3.**

In the present mechanism, however, there is further included an endless belt **64** which is passed around the rollers **50** and **52** which in this case need not necessarily be toothed but may be smooth surfaced. The pipe **33** now sits in a saddle **65** formed between the rollers **50** and **52** and across which the belt **64** travels.

The pipe therefore is rotated due to the traveling of the belt **64** around the rollers **50** and **52.**

Thus a further modified form of the invention is presented, it being noted that each form of the present invention has particular advantages over the other for specific uses.

What I now claim is:

1. A self-powered pipe wrench comprising a housing, an electric drive motor mounted in said housing, a pair of rollers rotatably mounted in said housing for rotation about parallel axes, means driven by said motor for rotating said rollers, a strap for engaging and retaining a pipe in position for rotation with its axis parallel with the axes of the rollers, said strap having one end secured to the housing and extending outwardly over said rollers and a positioned pipe, the other end of said strap being releasably secured to said housing so as to be openable to receive a pipe for engagement and to retain the pipe against movement away from said rollers upon subsequent closing, and means drivingly connecting the peripheries of said rollers with the periphery of the pipe to impart rotation to the pipe in response to rotation of said rollers.

2. A self-powered pipe wrench according to claim **1** and characterized further in that said other end of said strap is adjustably secured to said housing to accommodate pipes of different diameters.

3. A self-powered pipe wrench according to claim **2** and characterized further in that said strap carries a plurality of rollers positioned for contact with a pipe to allow pipe rotation during engagement thereof.

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