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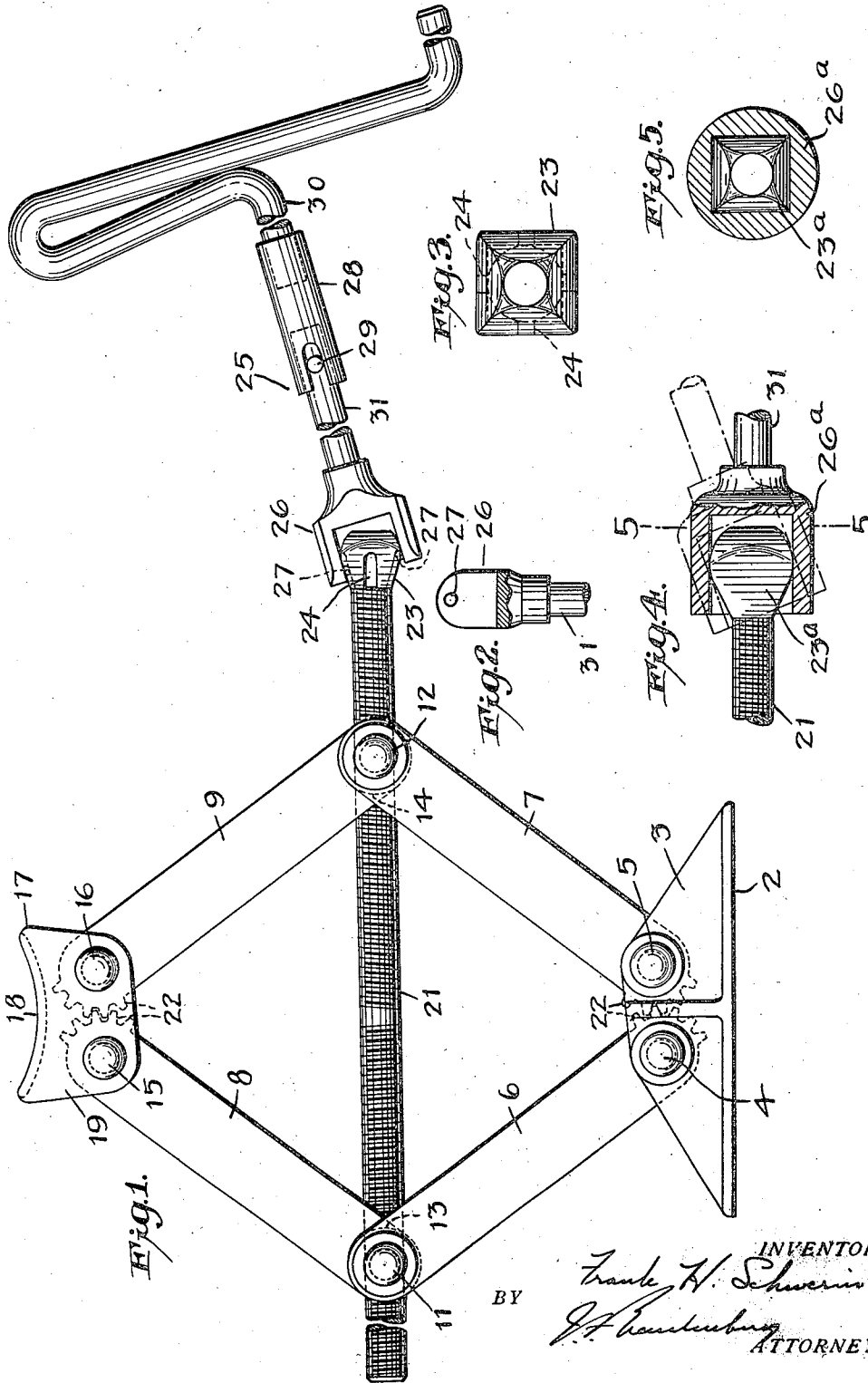
F. H. SCHWERIN

1,709,746

JACK

Filed March 2, 1928

2 Sheets-Sheet 1



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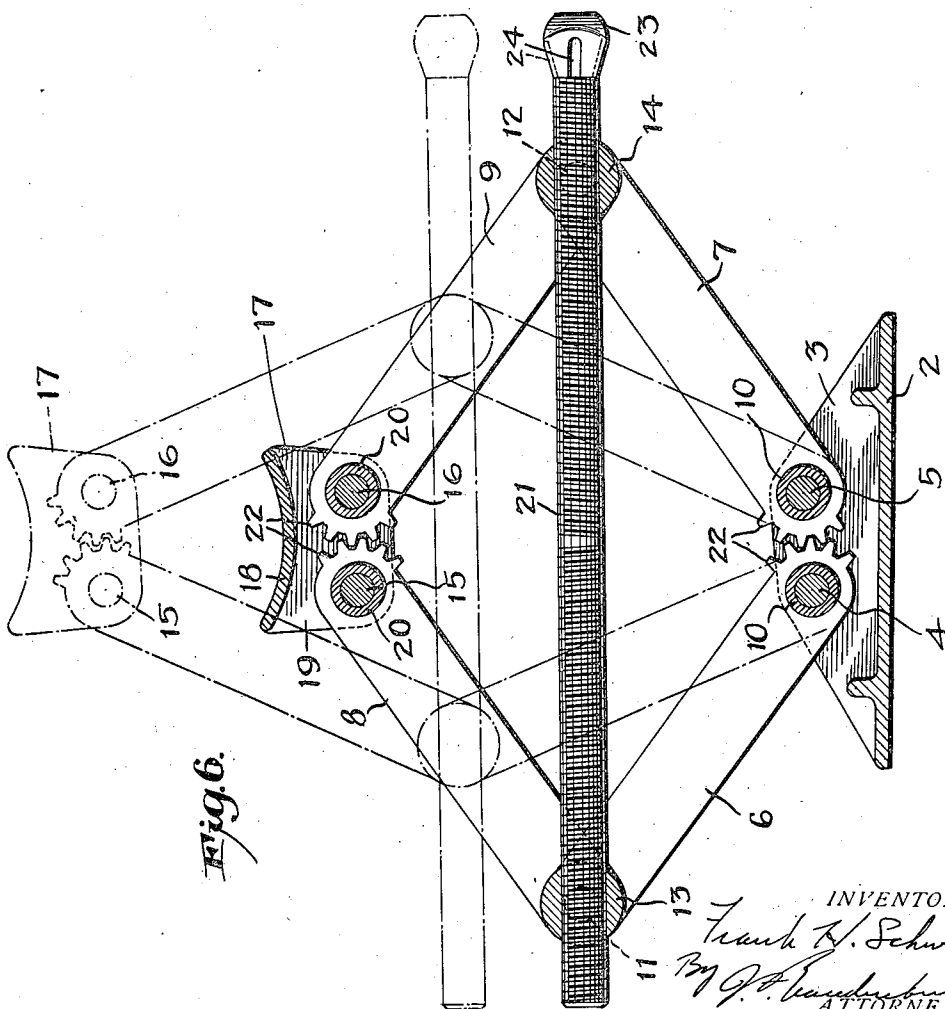
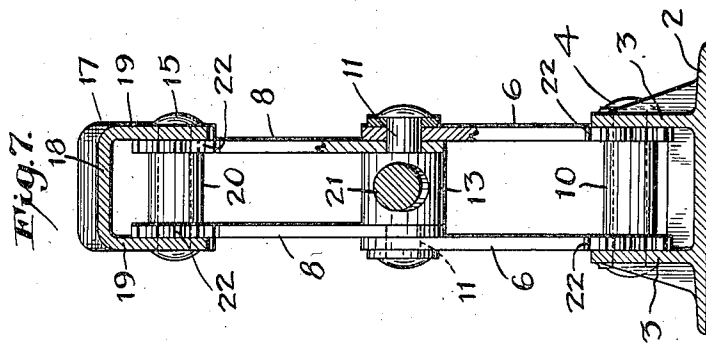
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2 Sheets-Sheet 2



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JACK.

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The invention relates to jacks and more particularly to lifting jacks.

The general object of the invention is to provide a jack of the geared toggle type which is very simple in construction, strong and efficient, and the elements and arrangement of which are such as very greatly to facilitate the manufacture and cheapen the cost of production.

In the accompanying drawings forming part hereof:

Fig. 1 is a side elevation of the improved toggle jack in a partly raised condition, with a portion of the screw shaft broken out, and showing also a long extension handle connected with the jack by means of the preferred form of the separable flexible operating connection, intermediate portions of the handle, constituting most of its length, being broken out;

Fig. 2 is sectional view of the part on the inner end of the separable handle, shown in a position in relation to Fig. 1 in which it can be entered into engagement with the jack;

Fig. 3 is an end view of the head on the actuating element of the jack illustrated in Fig. 1;

Fig. 4 is a fragmentary view with one part in section and another part in elevation, illustrating another form of separable operating connection between the jack and handle;

Fig. 5 is a cross-section on the line 5—5 of Fig. 4;

Fig. 6 is a sectional view of the jack proper taken in the central vertical plane of the axis of the screw, which itself is in elevation, full and broken lines being used to show different positions of the jack; and

Fig. 7 is a central vertical transverse section through the jack.

The jack has a suitable base 2 provided with spaced portions 3. These portions are pierced with alined openings for two pivots 4 and 5, the ends of which are upset outside of the portions 3, and it will be noted that the openings are so located that the axes of these pivots do not lie in a horizontal plane but are at somewhat different levels.

Two pairs of lower arm elements 6 and 7, forming two double arms, are swung on the pivots 4 and 5, the members of each double arm being separated by spacers 10.

Two pairs of upper arm elements 8 and 9,

also forming two double arms, are pivoted to the arms 6 and 7 on trunnions 11 and 12 projecting from members 13 and 14.

The upper ends of the arm elements 8 and 9 are swung on pivots 15 and 16 passing through the sides of an upper member or top 17. This member may be very simply and advantageously made of a saddle like piece having an incurved top rest 18 and depending side portions 19. Spacers 20 are interposed between the upper ends of the pairs of arm elements 8 and 9.

The actuating means of the jack preferably comprises a screw shaft 21, which is preferably a right and left hand screw, engaging the members 13 and 14 formed as nuts.

The arms 6 and 8 form a toggle, and the arms 7 and 9 form another toggle, the two toggles flexing in opposite directions. It will be understood that corresponding elements of the double arms 6 and 7 lie in the same vertical planes, and similarly the elements of the double arms 8 and 9.

The lower ends of the arm elements 6 and 7 are formed with integral toothed gear or segment formations 22, inter-gearing the toggles at the bottom. The upper ends of the arm elements 8 and 9 have the same formations 22 inter-gearing the toggles at the top.

An important feature of the jack thus far described is that all the arms, and indeed all eight of the arm elements 6, 7, 8 and 9 are duplicate and interchangeable, being of the same length, having the same pivot openings, and in particular having the same number of teeth 22 on one end of each, in precisely the same position on each link. This involves setting the pivots 4 and 5, or the centers of these pivots, at different levels on the base, as has been mentioned previously, in order that the teeth may intermesh. The centers 11 and 12 lie at similarly different relative levels, and the centers 15 and 16 connect the arms 8 and 9 with the upper member 17 also at the same relative difference of level. This last does not necessitate setting the top at an inclination, since, by appropriate relation between the top rest 18 and the pivot openings in the side portions 19, the top rest can be leveled.

Heretofore, in geared toggle or lazy tong jacks, it has been necessary to make different arm elements in order that the teeth might

mesh, and these elements have not been interchangeable. The present jack is more easily produced, at considerably less cost in dies, and with much greater facility in assembling, since any element will go in any position. Also, in case of repair, an arm element from a single stock will replace any arm element of the jack.

The inclination of the actuating shaft 21 resulting from the difference in level of the middle pivots has a further advantage in reducing the angle between this shaft and an operating handle in the operation of the jack.

Coming now to the operating handle, it will be seen that one end of the rotary actuating member of the jack, more particularly the higher end of the screw shaft 21, is provided with a squared, or generally polygonal or non-circular, head 23. The faces of this head are convex, or more or less circularly arcuate, in the longitudinal direction, and their inner portions are formed with longitudinal grooves 24.

A separate extension handle 25 has a fork socket 26 on its inner end, the sides of this fork having inwardly projecting pins or projections 27 adapted to engage the grooves 24. The fork 26 can be entered on and removed from the narrow or shank portion of the part 23 when the axes of the parts are approximately at 90°, or thereabouts, that is to say, at a decided angle, but when the handle is straightened more or less in line with the rotary actuating element of the jack, the pins 27 in engagement with the grooves 24 retain the handle against coming off sideways and against being pulled off endwise. Rotation of the handle will thus raise and lower the jack, and the handle can also be used to push the jack into place and to draw it out after the operation is over. The longitudinal convexity of the faces of the head 23 enables the handle to be held at a range of inclinations and still to operate the member 21.

The handle may be composed of two sections 30 and 31 that can be taken apart, the sections being connected by a sleeve 28 fixed to one section and having slots to be engaged

by pins 29 on the other section. The section 31 can be long enough to serve as a handle for withdrawing the jack.

In the modified construction shown in Figs. 4 and 5, the head 23^a lacks the grooves 24, and the part 26^a on the end of the handle may be simply a square socket. This construction also affords a separable and flexible connection between the jack and its handle, and the handle can be used for pushing the jack under a car, but not for drawing it out again.

It will naturally suggest itself that the parts 23 and 26, or 23^a and 26^a, might be reversed with respect to the jack and handle.

I claim:

1. A toggle jack comprising a base, a top, eight arm elements forming two toggles between the base and the top, and means for actuating the toggles, one end of each arm element having an integral toothed gear formation, and all eight arm elements being duplicate and interchangeable.

2. A toggle jack comprising a base, an upper member, two toggles, pivots connecting the arms of the respective toggles with each other, other pivots connecting the lower toggle arms with the base and the upper toggle arms with the upper member, said arms having integral meshing gear tooth formations at the top and bottom, and means for actuating the toggles, all corresponding pivots of the two toggles being at different levels, and all of the arms being duplicate and interchangeable.

3. A toggle jack comprising a base, an upper member, two toggles, pivots connecting the arms of the respective toggles with each other, other pivots connecting the lower toggle arms with the base and the upper toggle arms with the upper member, said toggles having integral meshing gear tooth formations at the top and bottom, all corresponding pivots of the two toggles being at different levels, and all of the arms being duplicate and interchangeable, and an inclined screw shaft connecting the middle pivots.

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