

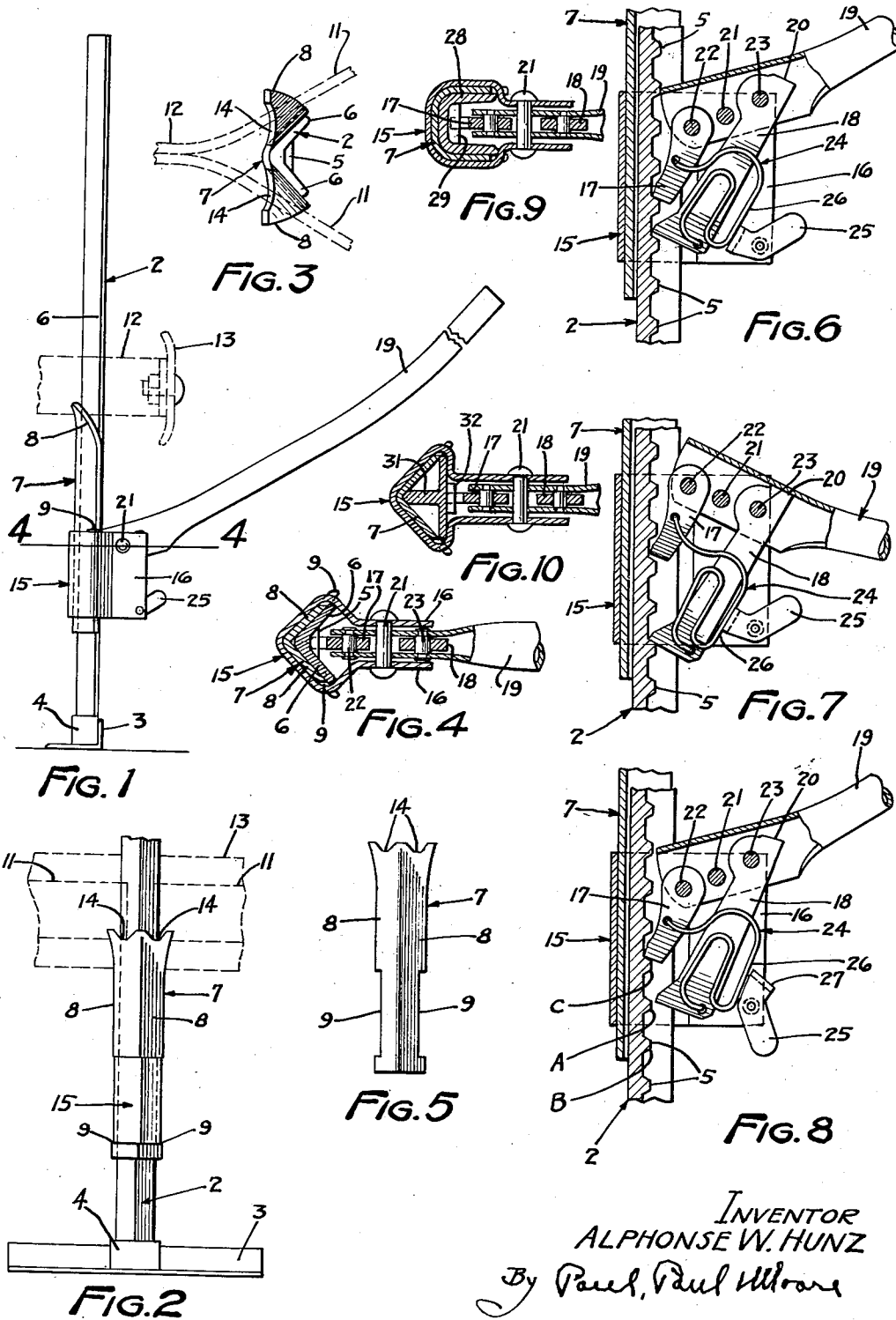
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LIFTING JACK

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## UNITED STATES PATENT OFFICE

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## LIFTING JACK

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5 Claims. (Cl. 254-110)

This invention relates to new and useful improvements in lifting jacks and more particularly to such jacks adapted for use in connection with automobiles and trucks.

An object of the present invention is to provide a simple and inexpensive mechanical jack which may be manufactured at extremely low cost and which is positive and efficient in operation.

A further object is to provide a lifting jack comprising an upright post of angular cross-section having a plurality of teeth integrally formed therewith and so spaced apart lengthwise of the post as to permit the post to be shaped by hot-rolling, whereby the post may readily and inexpensively be formed of high carbon steel, whereby the post may be made comparatively light in cross-section and its weight correspondingly reduced, which is a very desirable feature in devices of this general character.

A further object is to provide a lifting jack comprising an upright post having a housing slidable thereon and carrying a load-engaging member, and a suitable pawl mechanism being mounted within the housing and engageable with teeth on the post, said pawl mechanism having a suitable handle and being so constructed that one impulse is imparted to the housing for each up-stroke and each down-stroke of the handle, whereby two impulses are imparted thereto for each complete cycle of operation of the handle, thereby facilitating and expediting the operation of vertically translating the lifting member on the post, in either direction.

A further object of the invention resides in the novel construction of the load engaging member, which is of angular cross section and has its upper end provided with spaced notches adapted to engage both of the arms of the usual forked bumper supporting bracket of an automobile, whereby the weight of the load is uniformly distributed on the bumper bracket to avoid damage thereto.

Other objects of the invention reside in the novel construction of the upright post of the jack, whereby said post may readily and conveniently be hot-rolled to facilitate manufacture; in the simple and inexpensive construction of the operating mechanism for the lifting head, which comprises a pair of pawls pivotally mounted on a suitable operating handle at opposite sides of the pivotal support of said handle, whereby a double-action is imparted to the lifting head for each complete stroke of the handle,

regardless of the direction of movement of the lifting head on the post; in the novel spring means employed for urging the pawls or dogs into engagement with the teeth of the post; and, in the means provided for adjusting the pawl mechanism to reverse the traveling movement of the lifting head on the post.

Other objects of the invention will appear from the following description and accompanying drawing and will be pointed out in the annexed claims.

In the accompanying drawing there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawing:

Figure 1 is a side elevation of my improved jack;

Figure 2 is a front elevation thereof;

Figure 3 is a top view of Figure 1 with some of the parts omitted;

Figure 4 is a cross-sectional view on the line 4-4 of Figure 1;

Figure 5 is a front view of the load-engaging member, removed from the jack;

Figures 6 and 7 are views showing the pawl mechanism positioned to elevate the lifting head, and the handle being shown at the limit of its upper and lower positions;

Figure 8 is a view showing the pawl mechanism adjusted to reverse the movement of the lifting head on the post, as when lowering the load;

Figure 9 is a cross-sectional view similar to Figure 4, showing a modified construction wherein the upright post is channel-shaped in cross-section; and

Figure 10 is a similar view showing an upright post of T-shaped cross-section.

The novel automobile jack herein disclosed is shown comprising an upright post, generally designated by the numeral 2. A suitable base member 3 is secured to the lower end of the post 2 by suitable means such as indicated at 4, which may serve as a socket.

An important feature of the present invention resides in the novel construction of the post 2 which, as shown in Figures 6, 7, and 8, is provided with a plurality of spaced teeth 5, arranged in the bottom of the V formed by the angularly disposed flanges 6 of the post. The teeth are so shaped and spaced apart lengthwise of the post as to permit the post to be readily and

conveniently formed or shaped by hot-rolling, whereby it may be made of a suitable high carbon steel. By thus hot-rolling the post of high carbon steel, it may be made extremely light or small in cross section, which is highly desirable, in that it materially reduces the weight of the jack, when completed, and still provides a jack having great strength. To facilitate the operation of hot-rolling the post, the teeth 5 thereof are spaced apart approximately  $\frac{3}{8}$  of an inch from center to center, and the oppositely disposed faces of the teeth are beveled, as shown in Figures 6 and 8.

Another feature of the invention resides in the construction of the load-engaging member, generally designated by the numeral 7. This member, as shown in Figures 4 and 5, is of angle iron cross section, and its angularly disposed flanges 8 are slightly wider than the flanges or legs 6-6 of the post 2, whereby the marginal edges of the flanges of the load-engaging member 8 project slightly beyond the corresponding edges of the post 2, as clearly shown in Figure 4. Recesses 9 are formed in the edges of the legs 8-8 of the member 7, for purposes subsequently to be described.

The upper end of the load-engaging member 7 is preferably shaped, as shown in Figures 3 and 5, whereby it may engage both of the arms 11 of the usual supporting bracket 12 of the automobile bumper 13, shown in dotted lines in Figures 1 and 3. To thus engage the two arms 11 of the forked bumper bracket 12, the upper ends of the legs or flanges 8 of the load engaging member 7, are bent outwardly to substantially align the upper edges of the flanges 8, as best shown in Figure 3. V-shaped notches 14 are then formed in the upper edge of the lifting member, as shown in Figure 5. These notches are adapted to engage the lower edges of the arms 11 of the bumper supporting bracket 12, as shown in Figure 3, whereby the upright post 2 of the jack may extend upwardly between the arms 11. As a result of the lifting member 7 thus engaging both arms 11 of the bumper bracket, the weight of the load is uniformly distributed on the bracket and the jack, and thus reduces to a minimum the danger of damage thereto.

A suitable housing, generally indicated by the numeral 15, embraces the lower portion of the load-engaging member 7 and the post 2. This housing is preferably shaped from a suitable piece of sheet steel, and its sides are received in the recesses 9 provided in the load-engaging member 7, as best illustrated in Figures 2 and 4. The housing 15 is provided with laterally extending wall portions 16, spaced apart as shown in Figure 4, to provide an enclosure for the pawl mechanism, next to be described.

The pawl mechanism, as clearly illustrated in Figures 6 to 8, inclusive, comprises two dogs 17 and 18, the latter being relatively longer and larger than the dog 17. A suitable operating handle 19 has one end pivotally mounted in the housing 15 by a suitable pivot 21, which is located between the pivots 22 and 23 of the dogs 17 and 18, respectively. By thus locating the pivot 21 between the pivots 22 and 23 of the dogs, it will readily be noted that when the handle is oscillated about the axis of the pivot 21, the dogs 17 and 18 will alternately move up and down. A suitable spring 24 has one end connected to the dog 17 and its opposite end to the dog 18. This spring is so shaped that it constantly urges the dogs 17 and 18 into engagement

with the teeth 5 of the post 2, when the dogs are positioned as shown in Figures 6 and 7. The dog 18 has an abutment shoulder 20, which serves to limit downward movement of the handle 19.

Means is provided for adjusting the dogs to reverse the traveling movement of the housing 15 on the post 2 without changing the manipulation of the operating handle 19. To thus adjust the dogs or pawl mechanism, a suitable latch 25 is pivoted in the housing 15 and has one end adapted to engage the outer portion 26 of the spring 24, as shown in Figures 6 and 7. When the latch member 25 is thus positioned, the spring is retained in a position to cause both ends thereof to urge the dogs 17 and 18 into engagement with the teeth 5 of the post 2.

When it is desired to lower the lifting head 7, the latch member 25 is swung to the position shown in Figure 8, whereby the end portion 27 thereof moves out of engagement with the portion 26 of the spring. When thus positioned, the tension in the spring 24 will cause the dogs 17 and 18 to alternately move out of engagement with the teeth 5 of the post, when the handle is oscillated. In other words, when the latch member 25 is positioned as shown in Figure 8, and the handle 19 is in its uppermost position, as shown in this figure, the spring will cause the lower end of the dog 18 to move out of engagement with the rack bar or teeth 5 of the post, whereby when the handle is moved downwardly from the position shown in Figure 8, to that shown in Figure 7, the dog 18 will pass the top of the tooth A, and engage the next succeeding tooth B therebelow. When the dog 18 engages the tooth B, the load is transferred from the dog 17 to the dog 18, and the spring 24 then causes the dog 17 to swing out of engagement with the tooth C, whereby it will next engage the tooth A, when the handle is swung upwardly. From the foregoing, it will thus be noted that when the latch member 25 is in the position shown in Figure 8, continued manipulation of the handle 19 will cause the housing 15 and lifting head 7 to travel downwardly on the post, thereby to lower the load.

When the latch is in the position shown in Figures 6 and 7, the movement of the housing on the post is reversed, because the latch member then so positions the spring as to urge the dogs into engagement with the teeth 5 of the post, whereby oscillation of the handle will cause the dogs to so engage the teeth of the post as to cause the housing and load-engaging member to travel upwardly on the post.

The novel construction of the pawl mechanism is such that a double action is obtained. In other words, for each complete cycle of movement of the operating handle, two impulses are imparted to the lifting head in either direction, depending upon the position of the latch member 25. It will also be noted that a single spring provides the resilient means for urging both pawls into or out of operative engagement with the teeth of the post. The latch member 25 projects from the housing 15, as shown in Figures 6, 7, and 8, whereby the operator may readily shift it from one position to the other by engaging it with the toe of his shoe. The construction of the pawl mechanism of the entire jack is extremely simple and inexpensive, whereby the jack may be manufactured at extremely low cost. Also, because of the upright supporting post being made from high carbon steel, which is possible

because its construction is such that it may be hot-rolled, the jack may be made very light in weight, a very desirable feature in an automobile jack. The post 2 is composed of a single length of bar iron of any suitable cross-section, which may be applicable for the purpose. The upper and lower ends of the upright post 2 may be made substantially alike, whereby the base member 3 may be secured to either end thereof, so that should the teeth become worn on one side as a result of the dogs engaging only the upper sides thereof, as shown in Figures 6, 7, and 8, the post may be inverted in the base member 3 to present the opposite unworn faces of the teeth 5 to the dogs.

In Figure 9, there is shown a construction wherein the upright post 28 which corresponds to the post 2 in the preceding figure, is made of channel cross section. Suitable teeth 29 are formed in the bottom of the channel adapted to be engaged by the dogs 17 and 18 in a manner similar to the structure illustrated in Figures 1 to 8. When the upright post is channel shaped in cross-section, as shown in Figure 9, the lifting member 7 is correspondingly shaped, and the housing 15 is shaped to embrace the lifting member, as clearly illustrated in Figure 9.

In Figure 10, the upright post 31 is shown T-shaped in cross-section, and is provided on one side with suitable teeth 32 adapted to be engaged by the dogs 17 and 18. In the form shown in Figure 10, the load-engaging member 7 may be shaped in a manner similar to the load-engaging member, shown in Figure 5, and the housing 15 is shaped to conform to the shape of the lifting member.

By shaping the upright post 2 by the hot-rolling process, it may, as hereinbefore stated, be made of high carbon steel, whereby the cross-sectional area of the post may be greatly reduced, as compared to similar structures now used in the construction of jacks, and which are not produced by the hot-rolling process. In the operation of hot-rolling the post 2, the opposite faces of the teeth 5 may be suitably beveled, as shown in the drawing, which greatly strengthens the teeth and also simplifies the construction of forming the post.

I claim as my invention:

1. A lifting jack comprising a post of angular cross-section having a plurality of teeth integrally formed therewith and spaced apart lengthwise of the post, said teeth being located within the confines of the post, a lifting member of angular cross-section slidable on the post, the upper end of said member being provided with spaced notches adapted to engage an automobile bumper supporting bracket, an operating handle, a pivot on the lifting member for supporting the operating handle, a pair of dogs pivotally mounted on the handle at opposite sides of said pivot and adapted to alternately engage the teeth on the post, said dogs being so arranged that for each complete cycle of movement of the operating handle, said dogs will impart two like impulses to the lifting member in one direction, thereby facilitating the operation

of vertically translating the lifting member on the post to raise or lower a load.

2. A lifting jack comprising a post of angular cross-section having a plurality of teeth integrally formed thereon, said teeth being located within the confines of the post and the spacing between adjacent teeth being relatively greater than the size of a tooth to facilitate formation of the post, a lifting member slidable on the post and having its upper end notched to engage the forked supporting bracket of an automobile bumper, an operating handle carried by the lifting member, a double-acting pawl mechanism made operable by manipulation of the operating handle to engage said teeth and vertically translate the lifting member on the post to raise or lower a load, and means whereby the pawl mechanism may be adjusted to reverse the traveling movement of the lifting member on the post to lower the lifting member and load.

3. A lifting jack comprising a post formed with a longitudinal recess having a plurality of horizontally disposed teeth integrally formed with and located at the bottom of said recess, the opposed faces of said teeth being oppositely inclined to the horizontal and the spacing between adjacent teeth being at least 20% greater than the size of a tooth, thereby to facilitate formation of the post, said teeth extending across and forming a junction between the walls of the recess thereby to strengthen the structure of the post, and a lifting member slidable on the post and having an operating mechanism engageable with said teeth to longitudinally translate the lifting member on the post.

4. A lifting jack comprising an elongated post formed with a longitudinal recess and having a plurality of teeth disposed angularly with respect to the longitudinal axis of the post and integrally formed therewith and located within the recess of the post, each of said teeth having spaced, opposed faces oppositely inclined and the spacing between adjacent teeth being relatively greater than the side of a tooth, thereby to facilitate formation of the post, a housing slidable along the post and providing a lifting member, and operating mechanism carried by the housing and engageable with said teeth to translate the lifting member along the post.

5. A lifting jack comprising a post formed with a longitudinal recess having a plurality of teeth disposed thereon angularly with respect to the longitudinal axis of the post and integrally formed and located at the bottom of said recess, opposed faces of said teeth being oppositely inclined and the spacing between adjacent teeth being at least 20% greater than the size of a tooth, thereby to facilitate formation of the post, said teeth extending across and forming a junction between the walls of the recess thereby to strengthen the structure of the post, and a lifting member slidable on the post and having an operating mechanism engageable with said teeth to longitudinally translate the lifting member on the post.

ALPHONSE W. HUNZ.

**Certificate of Correction**

**Patent No. 2,266,760.**

**December 23, 1941.**

**ALPHONSE W. HUNZ**

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 37, claim 4, for the word "raccess" read *recess*; line 44, same claim, for "side" read *size*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of March, A. D. 1948.

**[SEAL]**

**THOMAS F. MURPHY,**  
*Assistant Commissioner of Patents.*