No. 721,613. PATENTED FEB. 24, 1903.

J. D. SMITH.

WHEEL HOLDING MACHINE.

APPLICATION FILED FEB. 20, 1902.

NO MODEL.

Fig. 1.

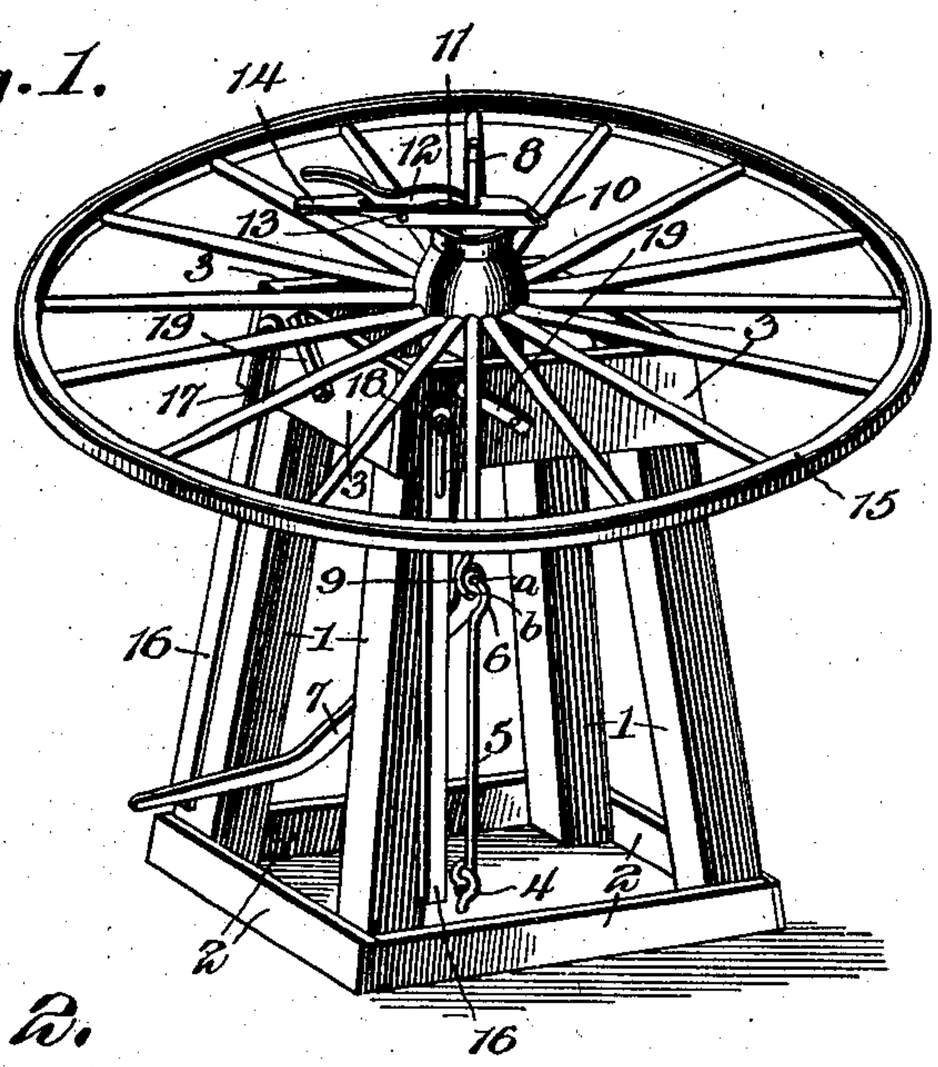


Fig. 2.

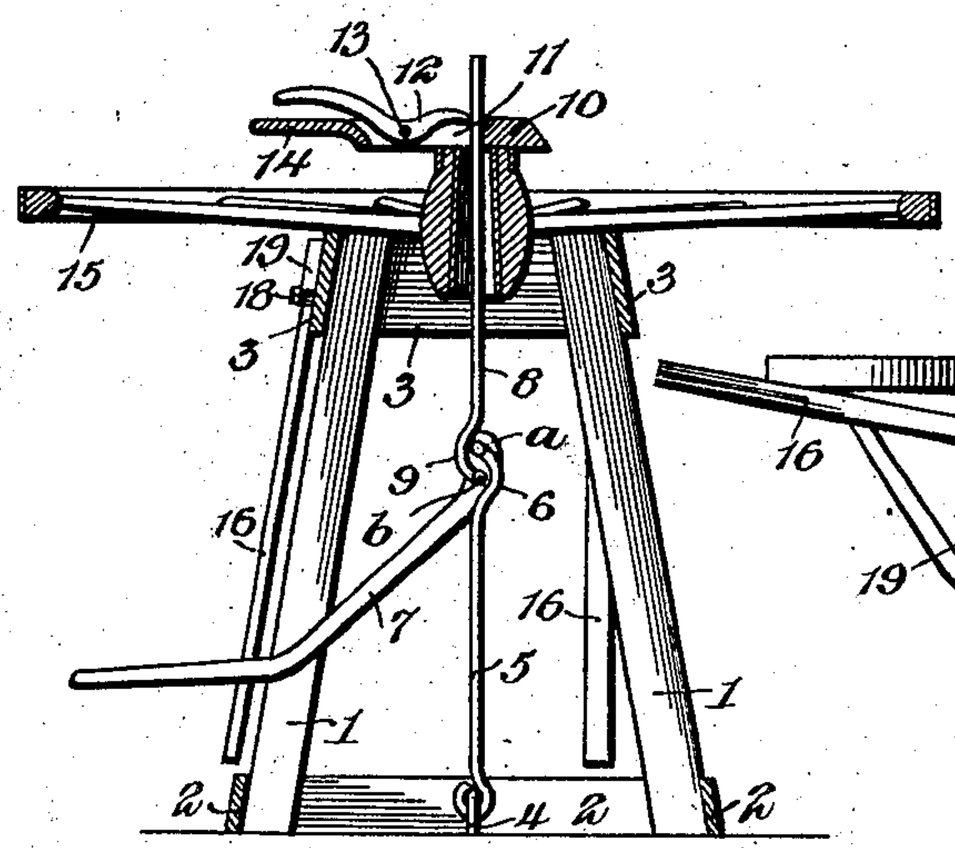


Fig. 4.

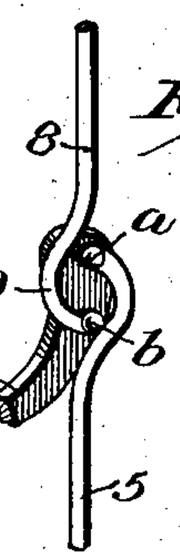
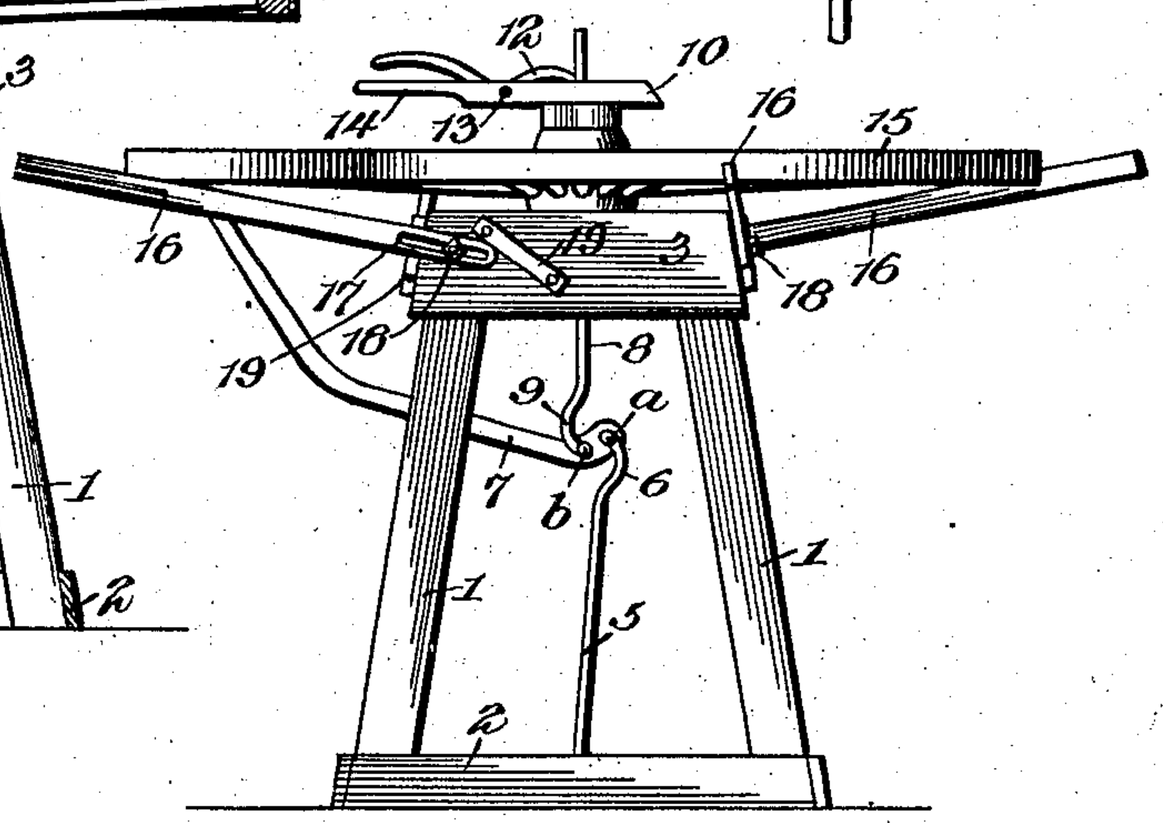


Fig. 3.



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UNITED STATES PATENT OFFICE.

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WHEEL-HOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,613, dated February 24, 1903.

Application filed February 20, 1902. Serial No. 95,000. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. SMITH, a citizen of the United States, residing at Arlington, in the county of Kingsbury and State of South Dakota, have invented a new and useful Wheel-Holding Machine, of which the following is a specification.

This invention relates to apparatus for holding vehicle-wheels for convenience in repairing the same.

The object of the present invention is to provide an improved apparatus which is arranged to support a wheel in a substantially horizontal position and hold the same rigidly, so as to obviate wabbling and looseness when the wheel is being operated upon, it being particularly adapted for the use of blacksmiths, wheelwrights, and wagon-builders.

Another object of the invention is to support the wheel at points adjacent to the hub, so as to prevent accidental dishing of the wheel, and also to support the wheel upon the rim thereof for setting a tire and also when it is desired to dish the wheel.

It is furthermore designed to provide for conveniently clamping a wheel upon the support regardless of the size thereof without requiring a complicated adjustment of the clamping means.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a perspective view of a wheel-supporting apparatus constructed and arranged in accordance with the present invention. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a side elevation of the apparatus arranged for dishing a wheel. Fig. 4 is a detail perspective view of the connection between the operating-lever and the connecting-links.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

In carrying out the present invention I employ a stand or supporting-frame comprising four corner-uprights 1, which are connected at their lower ends by means of cross bars or sills 2, applied to the outer sides of the uprights or legs, the latter being inclined inwardly and upwardly and connected at their upper ends by means of cross-bars 3, applied to the outer sides of the legs, with their upper edges flush with the tops of the legs, thereby forming an open head or top for the stand or frame. At the center of the bottom of this stand and secured to the floor or otherwise anchored is an eyebolt 4, from which rises a rod or link 5, having its lower end hooked into the eyebolt 4 to form a loose or pivotal connection therewith, the upper end of the rod or link being provided with a laterally-offset bowed portion 6. A vertically-swinging operating-lever 7 has its inner end pivotally connected to the upper terminal of the rod 5, and from this lever rises another rod or link 8, the lower end of which has a laterally-offset bowed portion 9, which is disposed reversely with respect to the offset portion 6 and is pivotally connected to the lever, whereby the latter forms a toggle connection between the two rods or links. It will of course be understood that the lever is sufficiently long to project laterally beyond the stand or frame so as to be in position for convenient manipulation.

The rod or link 8 is projected above the top of the stand and carries a hub-engaging clamp 10, which is provided with a longitudinal slot or opening 11 for the reception of the rod or link, which normally lies at one end of the slot. Within the slotted portion of the clamp is a dog or clutch 12, which is intermediately fulcrumed or pivoted, as at 13, near that end of the slot which is opposite the rod 8, one end of the dog being disposed to frictionally engage the rod and the opposite end being projected out of the slot to form a handle for releasing the dog or clutch from the rod. That end of the clamp-body which is beneath the handle portion of the dog is formed into a hand-grip 14, whereby the dog may be conveniently released by gripping the part 14 and the handle of the dog in one hand.

In using the device the clamp 10 is re-

moved from the rod 8 and a wheel 15 placed upon the top of the stand, with the rod projected upwardly through the opening in the hub, after which the clamp 10 is applied to the rod and slid downwardly into engagement with the upper end of the hub. After the wheel has been applied to the stand and before the clamp has been fitted to the rod or link the lever 7 is elevated to raise the rod 8, and after the clamp has been fitted in place against the end of the hub the lever is depressed, so as to draw the rod and the clamp downwardly, and thereby grip the wheel between the top of the stand and the clamp. By reason of the toggle connection between the lever and the two rods the joint is locked when the lever is depressed to its limit by reason of the fact that the pivotal connections *a* and *b* between the rods and the lever are drawn into vertical alinement, it now being understood that the rods or links are provided with the bowed offset portions 6 and 9 to accommodate the ends of the rods when the joint is locked. The wheel may be released by raising the lever and removing the clamp from the rod or link 8, after which the wheel may be lifted from the stand.

To support the wheel at the rim thereof for convenience in setting the tire, each side of the top or head portion of the stand is provided with an arm 16, which has one end provided with a longitudinal slot 17 for the reception of a bolt or similar fastening 18, which is carried by one of the cross-pieces 3 and forms a pivotal and slidable connection between the arm and the top of the stand. When not in use, the arm hangs downwardly, as shown in Figs. 1 and 2, but when in use is swung upwardly, so as to project laterally from the stand and inclined upwardly, with its slotted end bearing against an inclined abutment or shoulder 19, carried by the cross-piece 3, so as to support the arm in its elevated position. It will be understood that the arm has a pivotal movement in order that it may be swung up and down, and the slot 17 is to permit of this endwise adjustment of the arm in order that it may be shifted into and out of engagement with the shoulder or abutment 19. The arms correspond in number to the sides of the frame and are mounted to swing in planes substantially parallel to the respective sides of the stand or frame and are disposed at the corresponding ends of the sides of the stand. When the arms are adjusted into their elevated positions, the outer end portions thereof extend above the plane of the top of the stand, so that the wheel may be supported solely upon its rim, which engages the arms, the spokes of course being out of contact with the top of the stand. When supported in this position, downward pressure upon the hub, preferably imparted by the lever 7, the rods 5 and 8, and the clamp 10, will give the required dish to the wheel. The arms are also designed for supporting the rims of light wheels, such as carriage-wheels, when setting the tires thereof, and they are adjusted beneath the rim of a wheel after the same has been firmly clamped upon the supporting frame or stand.

The vertical rods, lever, and clamp could be used with a stand having a solid head, as commonly employed by wheelwrights and wagon-builders, the only change required being the provision of an opening through the head for the reception of the upper rod or link 8. When a solid head is employed, the hub of the wheel rests thereon instead of the spokes.

Should the dog 12 engage the rod 8 at a point above the body of the clamp, the rod would be bent by the pressure thereon, and therefore it is preferable to have the inner end of the dog engage the rod at a point just below the top of the clamp-body, so that the adjacent end wall of the slot 11 may brace the rod and prevent bending thereof.

A very important structural feature of the present device resides in disposing the inner end of the operating-lever 7 at an upward and outward inclination, with the links 5 and 8 connected to the opposite end portions of this inclined part, whereby the pivotal connections *a* and *b* normally lie in different horizontal planes, and it requires only a comparatively short movement of the lever to bring the pivotal connections into vertical alinement so as to lock the toggle connection and apply a powerful pressure to hold the wheel between the top of the stand and the clamp 10.

From the foregoing description it is apparent that the present device possesses several very important features of advantage, among which it will be noted that by the employment of a toggle connection for the lever it is not necessary to provide means upon the frame for locking the lever to hold the clamp or abutment 10 against the hub of a wheel, wherefore the device may be very conveniently manipulated and the lever automatically locks itself when forced to its downward limit. Another important advantage resides in the ease of adjustment of the clamp or abutment 10 and finally in the provision of the rim-engaging arms, which normally are disposed out of the way when not in use and may be conveniently brought into position for use without interfering with the other parts of the device.

What I claim is—

1. In a wheel-holder, the combination of a stand, upper and lower links, the lower link being anchored at its lower end, the upper link being extended above the stand, a lever pivotally connected to the adjacent ends of the links and arranged to swing the same past each other and in approximate vertical alinement to form a lock, and a wheel-clamp receiving the upper link and provided with a pivoted dog, the engaging portion of the dog being of greater length than the distance be-

tween the pivot and the link, whereby the clamp is adapted to engage the link at any point, substantially as described.

2. In a wheel-holder, the combination with a stand having an open top, of an upstanding link within the frame with its lower end loosely anchored, the upper end of the link being terminated short of the top of the stand and provided with a bowed laterally-offset portion, a vertically-movable lever having its inner end set at an upward and outward inclination and terminally pivoted to the upper end of the link, an upper link rising through and above the open top of the stand with its lower end bowed and offset laterally and pivoted to the inner end portion of the angular end of the lever, the two offset portions of the links being reversely disposed, and a wheel-clamp having a longitudinal slot receiving the upper end portion of the upper link and provided with a dog pivoted intermediately within the slot with its inner end disposed to grip the rod against the opposite end of the slot, the outer end of the dog being projected above the slot and formed into a handle.

3. In a wheel-holder, the combination with a stand, of laterally-projected arms carried thereby and inclined upwardly above the top of the frame to form rim-engaging supports, and means for applying pressure to the center of a wheel.

4. In a wheel-holder, the combination with a stand, of rim-supporting arms which hang from the upper end of the stand when not in use, and are capable of adjustment into upwardly and outwardly inclined positions with their upper end portions rising above the top of the stand, and means for applying downward pressure upon the center of a wheel.

5. In a wheel-holder, the combination with a stand, of rim-supporting arms mounted to swing vertically upon the sides of the upper end of the stand and also capable of endwise adjustment, abutments or shoulders carried by the sides of the upper end of the stand and disposed to lie against the inner ends of the arms and support the same when swung upwardly into operative positions, and means for applying downward pressure upon the center of a wheel.

6. In a wheel-holder, the combination with a stand, of stop shoulders or abutments upon the outer sides of the upper end portion of the stand, pivot-pins projected outwardly from the stand adjacent to the shoulders or abutments, rim-supporting arms having longitudinal slots pivotally and slidably embracing the respective pivot-pins, the slotted ends of the arms being disposed to lie in supporting engagement with the shoulders or abutments when swung upwardly into operative positions, and means for applying downward pressure upon the center of a wheel.

7. In a wheel-holder, the combination with a stand having an open upper end, of rim-engaging arms which hang from the upper end of the stand when not in use and are capable of being swung upwardly into inclined positions with their outer end portions rising above the top of the stand, an upstanding link loosely anchored within the frame with its upper end terminated short of the top thereof, a lever fulcrumed upon the upper end of the link, an upper link pivotally connected to and rising from the lever with its upper end projected through and above the open top of the stand, and a wheel-clamp adjustable longitudinally upon the upper projected end portion of the upper link.

8. In a wheel-holder, the combination with a stand, of shoulders or abutments upon the upper portions of the sides thereof, and vertically-swinging rim supporting and engaging arms mounted upon the stand and also capable of being shifted in endwise directions into and out of supporting engagement with the respective shoulders or abutments.

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Witnesses:
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