Patented May 21, 1940 2,201,488

UNITED STATES PATENT OFFICE

2,201,488

PROCESS OF PICKLING METALS

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No Drawing. Application October 5, 1938, Serial No. 233,477

16 Claims. (Cl. 148—8)

The present invention relates to the cleaning of metallic surfaces and particularly to a new class of steel pickling inhibitors which are employed to prevent undue attack upon the surface of a metal when in contact with a pickling bath of an acid nature.

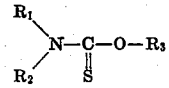
Pickling solutions for removing oxides from the surface of metals ordinarily consist largely of a dilute solution of an inorganic acid such as sulfuric or hydrochloric acid. The acid although it dissolves the oxides and scale, also attacks the metal to some extent so that the acid is largely consumed and a certain amount of metal is lost. It also appears that the hydrogen liberated by the action of the acid on the metal has a serious embrittling effect upon the metal being treated. The escaping hydrogen also carries with it a fine spray of the acid liquor from the pickling bath which produces an atmosphere possessing corrosive properties and one which is injurious to health and damaging to equipment.

By the present invention, these objectionable features of the pickling process are substantially overcome or reduced to a minimum. More specifically, some of the objects of the present invention are to obviate over-pickling, embrittlement and pitting of the articles treated; to minimize the amount of metal lost in pickling; to increase the efficiency of the pickling operation; to prolong the effective life of the pickling bath; and particularly to facilitate the pickling operation. Other and further objects of the invention will be apparent from the following description and accompanying examples.

To accomplish to as great an extent as possible the objects set forth in accordance with the present invention, there is added to the pickling bath an inhibitor or regulating agent which acts to restrain the action of the acid from attacking clean metal but assists in removing the rust, scale, and other deposits or in other words the inhibitor causes the acid selectively to remove such materials without appreciably attacking the clean portions of the metal under treatment.

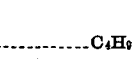
The new class of pickle regulators comprise the esters of thiocarbamic acids and are commonly referred to as thiourethanes. Except for the N-alkyl compounds which are liquids, they are usually solid crystalline compounds of relatively low melting point. One method for their preparation is by the action of ammonia or an amine on a xanthic ester although other methods have been described in the chemical literature and may be employed when desired. One precaution to be observed, whatever the method of preparation, is that the thiourethanes, while relatively stable compounds in other respects, readily undergo oxidation in the presence of mild oxidizing agents and should not be heated in the presence of oxidizing mineral acids nor in the presence of excess caustic soda which catalyzes their decomposition. The thiourethanes are a well known class of compounds and the present invention in nowise relates to their preparation nor is it limited thereto.

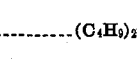
In order to further illustrate the class of compounds to which the present invention pertains, the thiourethanes are designated by the following structural formula

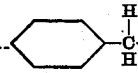


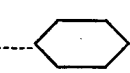
wherein R_1 and R_2 represent hydrogen, alkyl, aralkyl and carbocyclic groups, the latter term including typical aryl groups and hydrogenated aryl groups and R_3 represents an ester forming radical such as alkyl, aralkyl and carbocyclic groups, the latter term likewise including typical aryl and hydrogenated aryl groups.

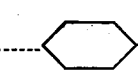
Typical examples of the preferred class of compounds are

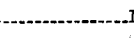
N-butyl thiourethane 

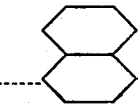
N-dibutyl thiourethane 

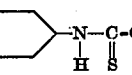
N-benzyl thiourethane 

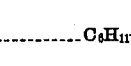
N-phenyl thiourethane 

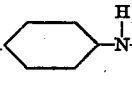
N-phenyl butyl thiourethane 

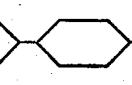
Thiourethane 

N-α-naphthyl thiourethane 

N-phenyl benzyl thiourethane 

N-cyclohexyl thiourethane 

N-phenyl β hydroxy ethyl thiourethane 

N-p-diphenyl thiourethane 

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EMERGENCY VEHICLE WHEEL

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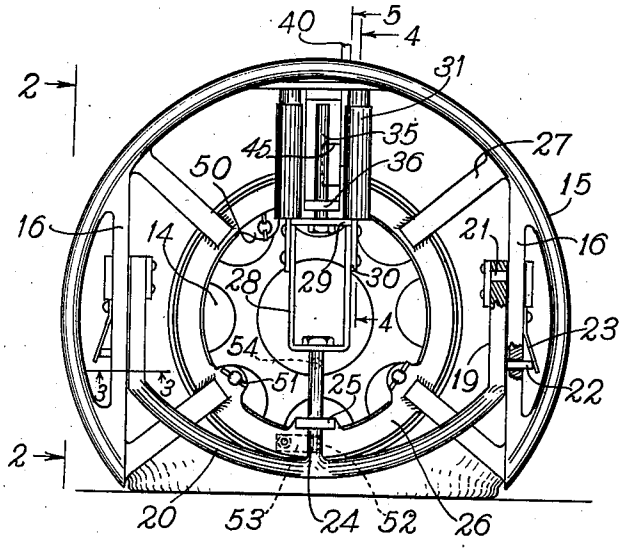


Fig. 1

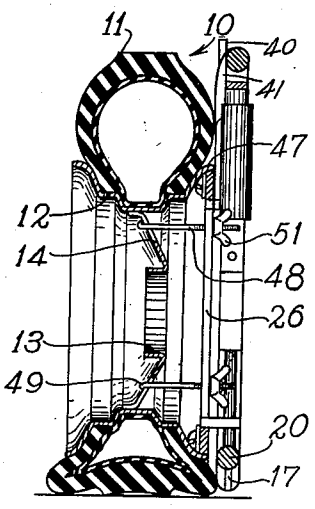


Fig. 2

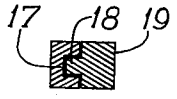


Fig. 3

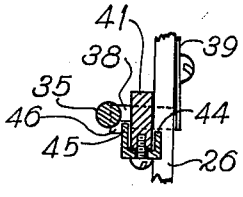


Fig. 6

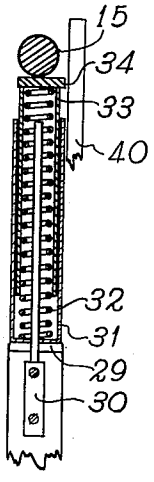


Fig. 4

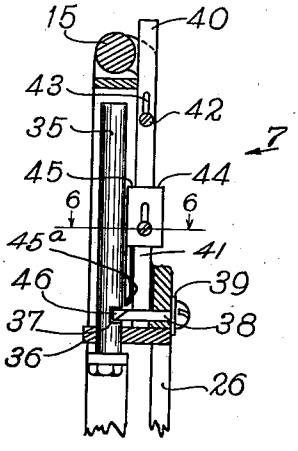


Fig. 5

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EMERGENCY VEHICLE WHEEL

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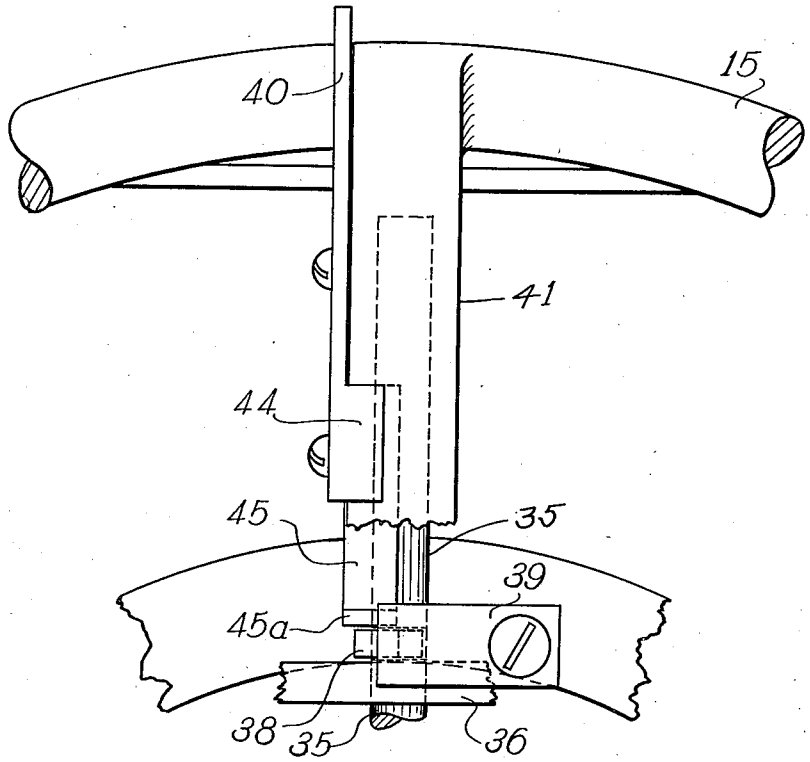


Fig. 7

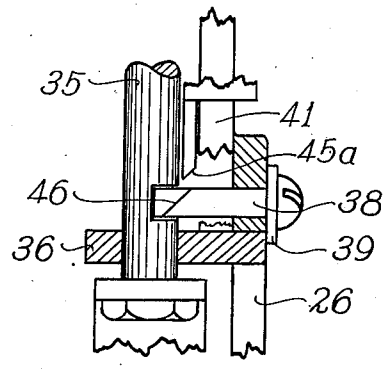


Fig. 8

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EMERGENCY VEHICLE WHEEL

Edward H. Hill, Chicago, Ill.

Application September 21, 1939, Serial No. 295,887

8 Claims. (Cl. 301—38)

My invention relates to emergency wheels for vehicles and more particularly to a wheel that is capable of being easily and quickly attached to the regular vehicle wheel in the event of a tire puncture so that the vehicle may proceed to its destination or a place of tire repair.

Generally speaking, my device takes the form of an auxiliary wheel having a rim segment that may be moved out of its wheel completing relation to the remainder of the wheel to facilitate attachment to the vehicle wheel when the tire is flat, the segment being thereafter automatically returned to wheel completing position when the vehicle is moved. A structure of this type therefore combines the features of a jack in that it removes the vehicle load from the disabled tire and also of an ordinary wheel since the vehicle may be driven on the emergency wheel.

Devices have heretofore been proposed for accomplishing this general result, but they have usually been provided with segments which swing out of the plane of the wheel. Structures of this nature, however, are incapable of being used with the modern motor car, because the emergency wheel is of necessity attached to the regular vehicle wheel and offset outwardly therefrom. Accordingly, if the emergency wheel were provided with a swinging segment, it would interfere with the aprons which hang from the fenders for improving the appearance of the vehicle and concealing parts of the chassis.

It is therefore the principal object of my invention to devise an emergency wheel having a movable segment that operates in the plane of the wheel and hence will not have its movement obstructed by any parts of the vehicle.

A further object is to provide a wheel of the character indicated having a ring member for closely fitting the inner surface of a vehicle wheel rim and providing a continuous bearing that serves to transmit the load of the vehicle to the emergency wheel.

These and further objects of my invention will be set forth in the following specification, reference being had to the accompanying drawings, and the novel means by which said objects are effectuated will be definitely pointed out in the claims.

In the drawings:

Fig. 1 is an elevation of my improved emergency wheel in the collapsed condition which it assumes when being applied to a vehicle wheel:

Fig. 2 is a sectional elevation of the wheel looking in the direction of the arrow 2 in Fig. 1.

Figs. 3, 4 and 5 are enlarged sections, taken along the lines 3—3, 4—4, and 5—5, respectively, in Fig. 1, looking in the direction of the arrows, and showing miscellaneous details of the wheel structure.

Fig. 6 is a section taken along the line 6—6 in Fig. 5, looking in the direction of the arrows, and showing the relation of the trigger mechanism to the remainder of the device.

Fig. 7 is an enlarged view looking in the direction of the arrow 7 in Fig. 5.

Fig. 8 is an enlarged, fragmentary view of the structure illustrated in Fig. 5, showing the relation of the trigger and latch devices.

Referring to the drawings, the numeral 10 designates a vehicle wheel having the usual inflatable tire 11 which is mounted in the customary manner on a rim 12 of a wheel 13 which is here shown as being of the disk variety having the usual circumferentially spaced openings 14 adjacent the juncture of the disk portion of the wheel with the rim.

My improved emergency wheel comprises a parti-circular member 15 which forms the major portion of the emergency wheel and is provided with a pair of spaced, parallel guideways 16, each of which includes a groove 17 for receiving a guide rib 18 formed on an arm 19 that is provided at each end of a curved segment 20. The distance between the guideways 16 is slightly greater than the length of the flat portion of a deflated tire, as clearly indicated in Fig. 1, and the curvature of the segment 20 is such that when moved downwardly from the position illustrated in Fig. 1, it will complete the circularity of the member 15 and thus form the complete emergency wheel. The diameter of this wheel, and hence of the member 15, may be the same as the diameter of the inflated tire 11, but is preferably slightly greater so that the tire 11 will not scrape along the ground when the emergency wheel is carrying its portion of the vehicle load. Each arm 19 is provided with an aperture 21 which receives a pin 22 that is slidably mounted in each guideway 16 and is normally pressed toward the arm 19 by one end of a spring arm 23 whose opposite end is secured to the guideway 16. Accordingly, when the segment 20 is moved downwardly as hereinafter described, the pins 22 are forced into the apertures 21 and hold the segment in wheel completing position.

A guide post 24 is secured to or formed integrally with the segment 20, preferably at the mid-portion thereof, and extends upwardly through a lug 25 carried by a bearing ring 26 that is concentrically related to the member 15 and