

No. 617,336.

Patented Jan. 10, 1899.

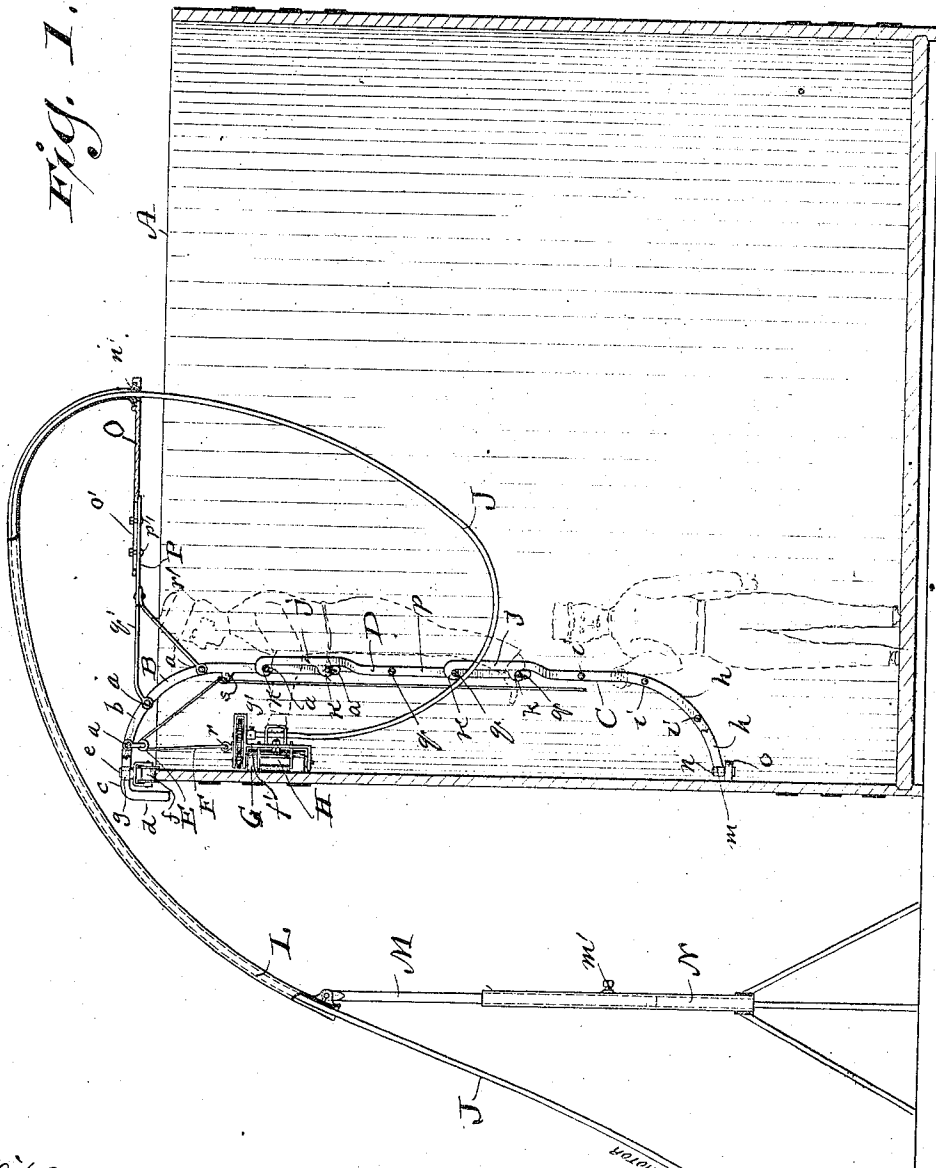
C. H. HANSEN.  
TANK PLANER AND SCRAPER.

(Application filed Sept. 1, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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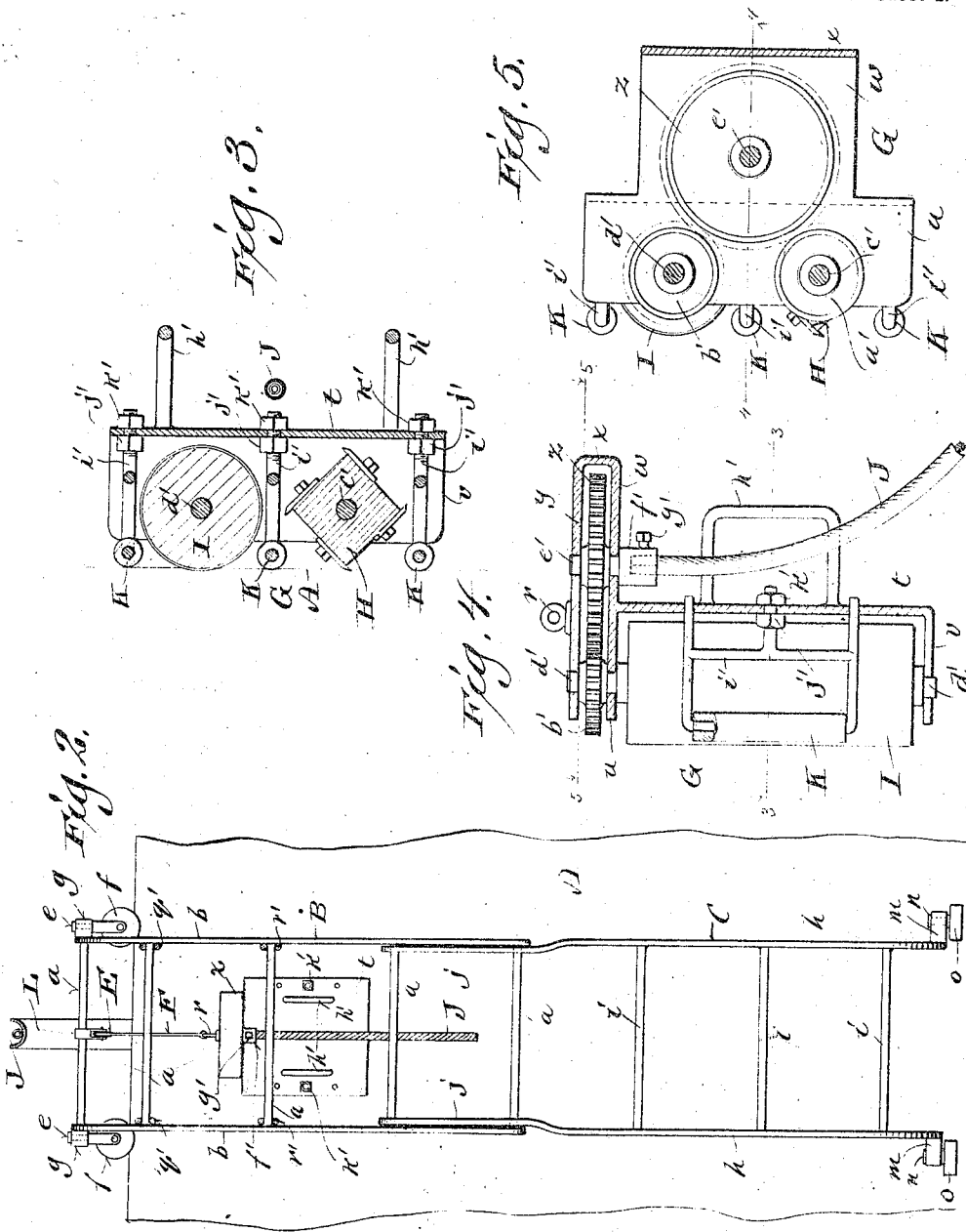
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

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## TANK PLANER AND SCRAPER.

SPECIFICATION forming part of Letters Patent No. 617,336, dated January 10, 1899.

Application filed September 1, 1897. Serial No. 650,253. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HANSEN, a citizen of the United States, and a resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Tank Planers and Scrapers; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates especially to devices for planing or scraping the interior surfaces of tanks and vats used in breweries and distilleries; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a central vertical sectional view of a tank with my device applied thereto in operative position and shown partially broken away to better illustrate certain details of construction. Fig. 2 is a rear elevation of the simplest form of my device with the supports for the flexible shaft shown in section. Fig. 3 is a detail sectional view taken on the line 3 3 of Fig. 4. Fig. 4 is a detail sectional view taken on the line 4 4 of Fig. 5. Fig. 5 is a detail sectional view taken on the line 5 5 of Fig. 4.

In breweries, distilleries, vinegar-factories, and other similar establishments it is customary to employ tanks or vats to contain the liquid product, and these tanks or vats are coated on their inner surfaces with varnish, shellac, or other substance, and after the lapse of time it becomes necessary to recoat said surfaces, preliminary to which the old coating is thoroughly scraped off, and to effect this removal of the old coating is one of the principal uses of my present invention, although it is also particularly adapted for smoothing the interior surfaces of such tanks or vats before any coating is applied thereto, and hence its use is not limited to the renovation of old tanks and vats nor to the treatment of the specific vessels referred to hereinabove, although I have illustrated my invention as applied thereto.

Referring to the drawings, A represents a circular tank or vat whose inner-surface is to be rendered clean and smooth by abrasion.

B is the upper section, and C the lower section, of a ladder, which may consist of as many

sections as the height of the tank or vat requires, as hereinafter explained. In Fig. 1 I show this ladder provided with one intermediate section D between the upper and lower sections already named, while in Fig. 2 I show the simplest form of said ladder, comprising only the said two sections B and C. The upper section B consists of two parallel side pieces *b b*, united by rounds *a a*, and with the upper ends of said side pieces preferably rounded over outwardly and thence continued horizontally and finally brought down vertically, as shown at *b c d* in Fig. 1. From lugs *g g* on the practically horizontal outer end portions *c* of the ladder side pieces *b* there depend the swiveled shanks *e* of vertically-disposed grooved or flanged rollers *f*, whose grooves or flanges take in the upper top of the tank or vat, as shown in Figs. 1 and 2, the swiveled attachment of the said rollers permitting them to turn freely to correspond to the curved path they have to travel around the tank-top. The lower section C of the ladder is formed with parallel side pieces *h h*, united by rounds or rungs *i i*, the upper ends of said side pieces being offset inward and contracted toward each other and thence continued vertically upward, as shown at *j j*; these upper portions of said side pieces being formed with hooks *k k*, projecting outwardly therefrom to engage with the two lower rounds of the ladder-section above. The lower ends of the side pieces *h h* of the lower ladder-section are outwardly rounded and at their extreme ends are provided with lugs *m m*, wherein are swiveled the shanks *n* of horizontally-disposed rollers *o*, adapted to bear against the inner surface of the tank, as shown in Figs. 1 and 2. The intermediate ladder-sections D are formed with straight parallel side pieces *p*, united by rounds or rungs *q*, as shown in Fig. 1, and said side pieces are offset inwardly and contracted and thence continued vertically upward, as shown at *j*, and these upper ends are formed with hooks *k k* for engagement with the two lower rounds of the ladder-section immediately above, exactly as in the case of the upper ends of the lower ladder-section C, already described. From the upper round *a* of the upper ladder-section B there is suspended a pulley E, around which passes a

rope F, one end of which is secured to an eye *r* on the abrading-tool G, said rope being secured to a lug or eye *s* on the upper ladder-section B.

5 The abrading-tool G is shown in detail in the several views Figs. 3, 4, and 5 and comprises a vertical back plate *t*, having parallel upper and lower horizontal flanges *u v*, the upper flange *u* being extended back beyond  
10 the back plate, as shown at *w*, thence upwardly, as shown at *x*, and thence forwardly, as shown at *y*, this upper part, comprising the flange *u* and its extensions *w x y*, forming a  
15 ease to receive the gear-wheels *z a' b'*, while the abrading-tools are received in a case formed by the back plate *t* and its flanges *u v*. These tools in the preferred form illustrated in the drawings consist of a planer-head II,  
20 provided with suitable knives, and an abrading-cylinder I, covered with sandpaper, the said tools being rigidly secured to the vertically-disposed journals *c' d'*, and the gear-wheels *a' b'* being of equal size and keyed to the said journals *c' d'*, respectively, while the  
25 gear-wheel *z* is of much greater diameter and is in mesh with both of the other gear-wheels, as best shown in Fig. 5. This wheel *z* is keyed to a short journal *e'*, mounted in the parts *w y* of the described case, the said journal *e'*  
30 below the part *w* having rigidly secured thereto a socket *f'*, within which is secured, as by set-screw *g'*, one end of a flexible shaft J, so that when the gear-wheel *z* is revolved by said flexible shaft, as hereinafter described,  
35 the gear-wheels *a' b'* will both be simultaneously revolved and each in the same direction. The back plate *t* is fitted with suitable handles *h' h'*, so that the operator can hold the abrading-tool G steadily against the surface  
40 to be planed or abraded, as shown in Fig. 1, and to regulate the depth or thickness of the surface to be removed the said tool is provided with a series of rollers K K K, vertically mounted on adjustable frames *i' i' i'*,  
45 the opposite ends of said frames consisting of a series of rods projecting through openings in the back plate *t* of the tool-casing and the projection of said rollers with respect to the tools II I being regulated by the adjusting-  
50 nuts *j' k'* on the screw-threaded ends of said rods.

The flexible shaft J is of the ordinary well-known construction, and its outer end is attached to any suitable motor (not shown) for  
55 furnishing the required power to revolve the planing or abrading tools. It is desirable that this shaft should be so supported as to be free from entanglement with the tank or ladder as the latter is revolved around the tank, as hereinafter explained, and, further, so that said  
60 shaft J should enter the tank at the vertical central line of said tank. To that end I provide the curved open-topped trough L, pivotally secured to the upper end of the adjustable rod M, which latter telescopes within  
65 the upright tubular part N of a suitable stand or tripod, said part N being provided with a

set-screw *m'* for holding the rod M fast when properly adjusted. The other end of the  
70 trough L is secured to the free end of a sliding bar O, adjustably secured to a bar P, projecting from the upper ladder-section B, to which it may be secured by rods and braces *q' r'*, and the adjustment of the bars O P may be effected  
75 by means of a slot *o'* in one bar and clampscrews *p' p'* passing through said slot and through holes in the other bar, so that the support O P may be extended or reduced in  
80 length as may be found necessary in order that the free end of the part O may come over the vertical center of the tank and be held in that position. The inner end of the described open trough L terminates in a ring  
85 or collar *n'*, which is fitted and secured to the free end of the rod O, and the flexible shaft J after traversing the length of the curved open trough L is passed through this ring or collar *n'*, and thence down into the tank at  
90 the described vertical central-line thereof, and then up to the suspended tool G and secured within the described socket *f'* by set-screw *g'*, as shown in Fig. 1.

The operation of my invention will be readily understood from the foregoing description of the construction of my devices, taken in  
95 connection with the accompanying drawings. Let it be understood, for example, that a circular tank or vat A is to have its inner surface thoroughly planed or scraped, so as to  
100 remove the old shellac or varnished coating, and thus prepare it for a new coat. First the frames *i' i' i'* on the tool G are adjusted so that the cylinder I and planer II shall project only the required distance beyond the  
105 line of the rollers K K K to insure the requisite depth of the cut or abrasion. Then the sectional ladder is supported on and within the tank, as many of the intermediate sections D being employed as is necessary to  
110 bring the lower section C within easy handling distance of the ladder operator. (Shown in dotted lines in Fig. 1 as standing on the bottom of the tank.) The tool G is now suspended by the rope F and pulley E from the  
115 upper section B of the ladder at the proper height for beginning the work, which would be close to the top of the tank. The tool operator now climbs up the ladder and standing  
120 thereon grasps the tool G by the handles *h' h'* and presses the abrading devices II I firmly against the inner surface of the tank, and then, power being applied from the motor to the flexible shaft J, the ladder operator starts on his annular travel around the tank,  
125 pushing the ladder in front of him till he has completed a circle. Then the tool G is lowered to the position required to cut the new circle, and the rope F again made fast, and the operation first described is repeated,  
130 and so on until the tank-wall has been entirely planed and sandpapered.

It is obvious that under some circumstances the tools for cutting or abrading may be modified, according to the nature of the work to be

done or the surface to be operated upon, as sometimes only planing or sandpapering may be necessary, and in place of a sandpaper-cylinder sometimes a circular stiff-wire brush may be used, and therefore I do not limit myself to the precise construction of the abrading-tool shown and described, although in most instances and especially in the removal of old shellac coatings I prefer to use the tool organized as shown in the drawings.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A device for planing or scraping the interior of tanks or vats, comprising a suspension-ladder provided with rollers adapted to travel on the top edge of a tank, a planing or abrading tool adjustably suspended from said ladder, and a flexible shaft revolubly connected to said tool, substantially as set forth.

2. In a device for planing or scraping the interior of tanks or vats, the combination with a suspension-ladder provided with an upper set of rollers adapted to engage with and travel on the top edge of a tank and a lower set of rollers adapted to engage with and travel on the inner surface of said tank, a planing or abrading tool adjustably suspended from said ladder, an extensible supporting-bar projecting from said ladder toward the center of said vat, an exterior vertically-adjustable supporting-stand, a curved trough extending from said stand to said bar, and a flexible shaft supported in said trough and revolubly connected to said tool, substantially as set forth.

3. In a device for planing or scraping the interior of tanks or vats, the combination with a sectional suspension-ladder provided with rollers adapted to travel on the top edge of a tank, of a planing or abrading tool adjustably suspended from said ladder, substantially as set forth.

4. In a device for planing or scraping the interior of tanks or vats, the combination with an upper ladder-section consisting of parallel side pieces curved outwardly at their upper ends and united by rounds or rungs, vertically-disposed flanged or grooved rollers hav-

ing shanks swiveled to said section for engagement with the tank-top, one or more lower ladder-sections having similarly-united side pieces inwardly offset and contracted at their upper ends, and provided with hooks for engagement with the rounds of the section above, and the lowest section of the ladder having its side pieces outwardly rounded at their lower ends, horizontally-disposed rollers having shanks swiveled to said section for engagement with the inner surface of the tank, and a planing or abrading tool adjustably suspended from said sectional ladder, substantially as set forth.

5. In a device for planing or scraping the interior of tanks or vats, the combination with a suitable case of a journal vertically mounted therein, a gear-wheel on the end of said journal, a tool having a cutting or abrading surface rigidly secured to said journal, movable frames on each side of said tool, carrying vertical rollers at one end and adjusting devices at the other end, another gear-wheel journaled in said case in engagement with the gear-wheel on the tool-journal and a revoluble flexible shaft secured to the journal of said other gear-wheel, substantially as set forth.

6. In a device for planing or scraping the interior of tanks or vats, the combination with a suitable case of a pair of journals vertically mounted therein, gear-wheels on the ends of said journals, a planer-head on one of said journals and an abrading-cylinder on the other journal, movable frames adjacent to said tools, carrying vertical rollers at one end and adjusting devices at the other end, another gear-wheel journaled in said case in engagement with both of the first-named gear-wheels, and a revoluble flexible shaft secured to the journal of said other gear-wheel, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

CHARLES H. HANSEN.

Witnesses:

H. G. UNDERWOOD,  
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