Sept. 26, 1950 M. KNOBEL 2,523,958

DREDGE BUCKET

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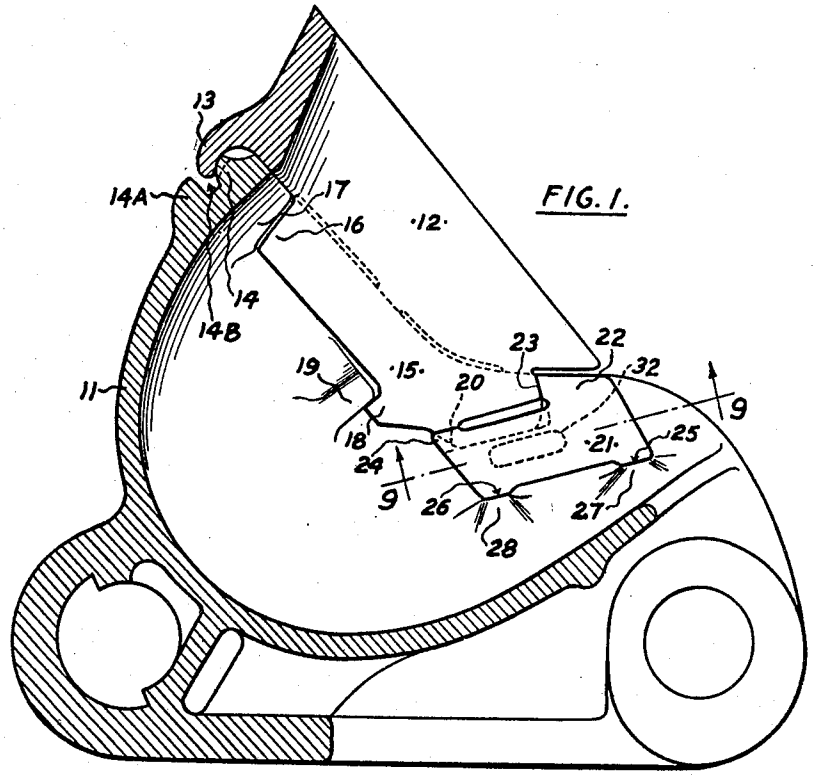


FIG. 1.

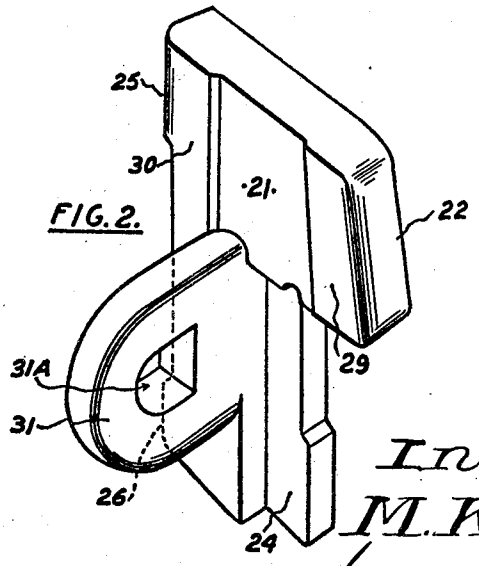


FIG. 2.

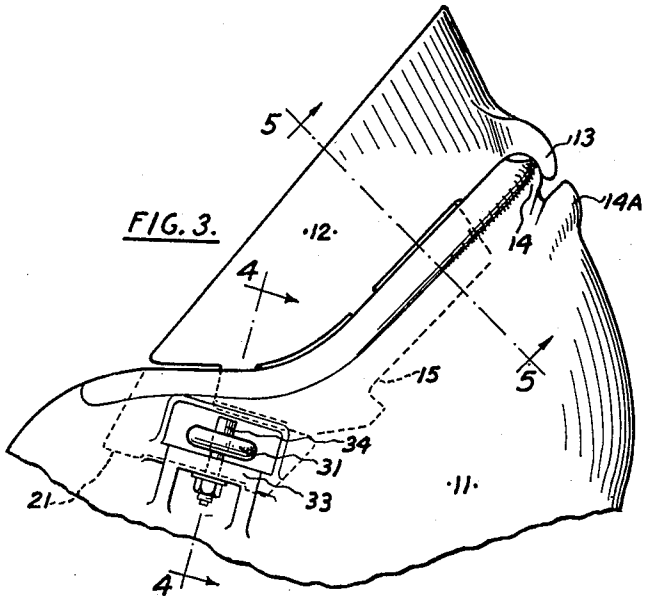
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DREDGE BUCKET

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FIG. 3.



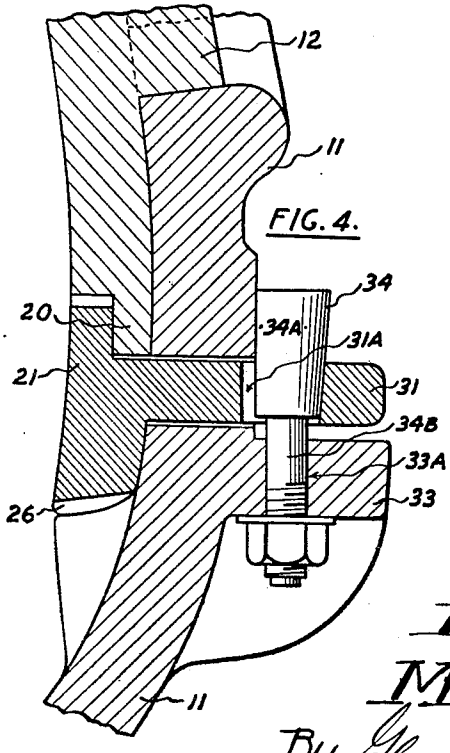


FIG. 4.

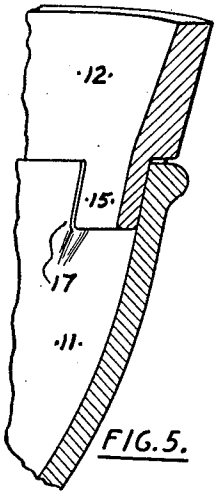


FIG. 5.

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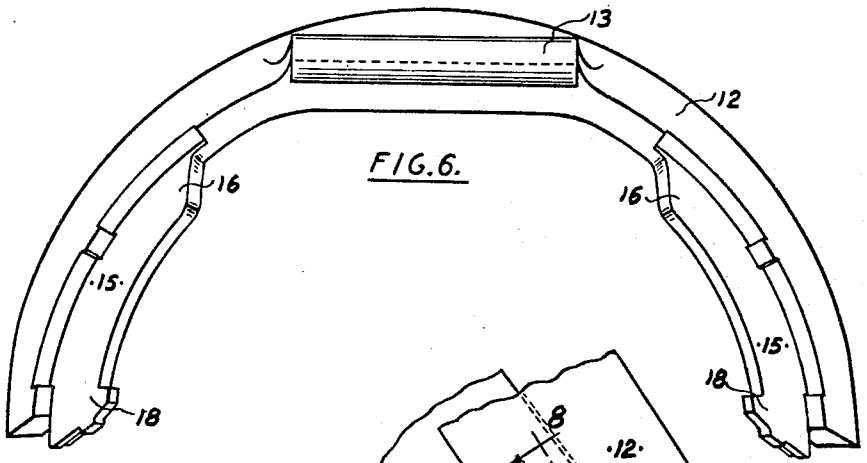


FIG. 6.

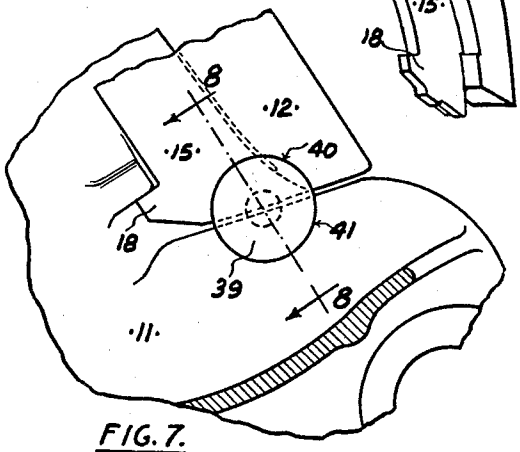


FIG. 7.

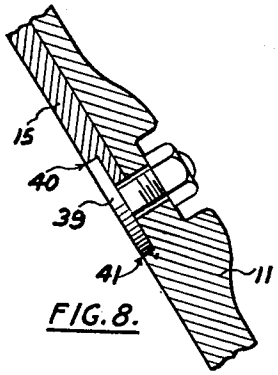


FIG. 8.

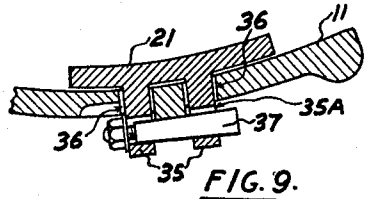
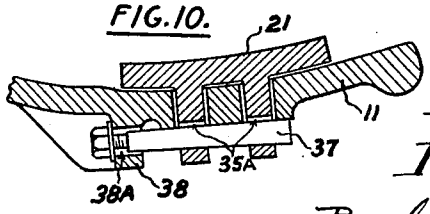


FIG. 9.

FIG. 10.



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UNITED STATES PATENT OFFICE

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DREDGE BUCKET

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Application July 31, 1946, Serial No. 687,313
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14 Claims. (Cl. 37—191)

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This invention relates to dredge buckets of the type having a wear resisting lip secured thereto and is particularly directed to those buckets wherein the wear resisting lip is rigidly, but detachably secured to the dredge bucket without the use of rivets.

The invention has been devised to provide an improved construction of a dredge bucket and detachable wear resisting lip wherein the lip is firmly secured to the dredge bucket but may be readily detached for renewing, and wherein the dimensional tolerances of the engaging parts of the bucket and lip may be increased and manufacturing costs reduced.

Another advantage of the invention is that slight distortions of the lip can occur without seriously interfering with the seating of the lip on the bucket or its locking to the bucket.

Another advantage is that the bucket and lip are easily cast and that less machining is necessary than in known buckets and bucket lips.

Another advantage is that no locking means, for example projecting bolts, are used at the front of the lip where such projecting members are liable to be damaged during dredging operations.

Accordingly therefore the invention comprises a combination including a dredge bucket, a detachable bucket lip, a seating on part of the upper edge of said bucket to receive a lower edge of said bucket lip, a central apron depending from the outside of the lower edge of said lip and fitting outside said bucket when in operative position, end aprons depending from the inside of the lower edge of said lip, each said end apron fitting inside said dredge bucket when in operative position, the length of each said end apron being such as not to overlap said central apron, and means for locking said lip to said bucket, near each end of said lip.

One form of the invention will now be specifically described with reference to the drawings in which—

Fig. 1 is a sectional elevation of the bucket and associated parts;

Fig. 2 a view of a key block;

Fig. 3 an elevation of part of the bucket and associated parts;

Fig. 4 a section along line 4—4 of Fig. 3 showing one type of external locking means;

Fig. 5 a sectional elevation of part of the bucket, the lip and its end apron along the line 5—5 of Fig. 3;

Fig. 6 an inverted plan view of the lip;

Fig. 7 an elevation showing one method of connecting the lip and the bucket;

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Fig. 8 a section along line 8—8 of Fig. 7;

Fig. 9 a section along line 9—9 of Fig. 1 showing an external locking means different from that shown in Fig. 4, and

Fig. 10 a section similar to that of Fig. 9 showing another external locking means.

Referring particularly to Figs. 1, 5 and 6, 11 is a dredge bucket and 12 a bucket lip. A seating is formed on part of the upper edge of the bucket 11 to receive the lower edge of the lip 12. The lip 12 is approximately semi-elliptical in plan and has depending from the outside of its lower edge a narrow central apron 13 and from the inside of its lower edge, wider end aprons 15.

The central apron 13 is hooked in cross section and adapted to roll on a complementary central portion 14 on the outside of the bucket 11 near its upper edge.

A shear pad 14A similar to but thicker than portion 14 is provided leaving a groove 14B for locating the apron 13 between 14 and 14A. This pad prevents material lodging in groove 14B when the buckets are discharging.

To assemble the lip and bucket the apron 13 is located in the groove 14B, the lip 12 is rotated clockwise to the position shown in Fig. 1 and the lip and bucket are locked together. To disassemble, the procedure is reversed.

The end aprons 15 fit inside the bucket 11, one end 16 of each apron 15 adjacent the apron 13 being positioned adjacent a projection 17 on the inside of the bucket 11 and a projection 18 on the other end of apron 15 abutting against a projection 19 on the inside of the bucket 11. When the lip 12 is in its operative position, the lower edge of the lip is seated continuously on the upper edge of the bucket near the centre apron and discontinuously near the end aprons.

The end of each end apron adjacent the end of the lip is stepped at 20 to receive a complementary stepped portion of an irregularly shaped key block 21. The inside of the bucket is provided with a recess near the end of the lip to accommodate the stepped end of the apron 15 and the key block 21.

Each key block 21 (see Fig. 2 and elsewhere) includes a projection 22 which engages a step 23 formed at the junction of the end of the lip 12 and the end of the apron 15, a step portion 24 which engages the step 20 on the end of the apron 15, bearing surfaces 25, 26 which engage corresponding surfaces on projections 27, 28 respectively on the bucket 11, bearing surfaces 29, 30 which engage the inside surface of the bucket and a lug 31 which passes through a hole

32 in the bucket 11. The lug 31 has a hole 31A in it which is approximately semi-circular in cross section and when each block 21 is in position the hole in each lug 31 is opposite a circular hole 33A in a lug 33 (see Figs. 3 and 4) integrally attached to the outside of the bucket adjacent the end of the lip.

A pin 34 (Fig. 4 and elsewhere) is tapered and approximately semicircular in cross section for a part 34A of its length and straight, circular in cross section and threaded for the remaining part 34B of its length. To lock the lip 12 to the bucket 11 by means of the key blocks 21, the pin 34 is passed through each hole 31A and each hole 33A, wedged and locked in position by a conventional locknut arrangement.

In an alternative construction (see Fig. 9) each key block 21 has two parallel lugs 35 similar to lug 31 passing through holes 36 corresponding to hole 32. Lug 33 is dispensed with. A pin 37, similar to pin 34 except that the tapered portion is relatively longer than portion 34A, passes through holes 35A similar to holes 31A, is wedged against the outside surface of bucket 11 and is locked in place as before.

In an alternative construction to that shown in Fig. 9 (see Fig. 10) the pin 37 passes through holes 35A and a third hole 38A in a lug 38 integral with the bucket 11.

Figs. 7 and 8 illustrate an alternative method of connecting the lip 12 to the bucket 11 in their operative position. The corresponding ends of the lip and the bucket are left straight (Fig. 7) and the inner surfaces of the end of the lip and of its apron are flush with the adjacent inner surface of the bucket (Fig. 8).

The lip and bucket are connected together by means of a headed threaded pin, the circular head 39 seating in a circular recess, one part 40 of which is in the inside surface of the lip and apron and the other part 41 in the inside surface of the bucket, and the pin being locked in place by a locknut.

I claim:

1. A combination including a dredge bucket, a detachable bucket lip, a seating on part of the upper edge of said bucket to receive a lower edge of said bucket lip, an integral central apron depending from the outside of the lower edge of said lip and being hooked in cross section, a complementary central portion on the outside of said dredge bucket near its upper edge and which is engaged by said central apron and on which said central apron can roll, integral end aprons depending from the inside of the lower edge of said lip, each said end apron fitting inside said dredge bucket when in operative position and means for locking said lip to said bucket near each end of said lip.

2. A combination as in claim 1 including also a projection on the inside of said bucket near each end of said central apron, a projection on the end of each end apron adjacent said projection on said bucket, a second projection on the inside of said bucket adjacent each end of said lip and a projection on the end of each end apron adjacent the end of said lip which engages said second projection on the inside of said bucket.

3. A combination as in claim 1 including a shear pad on the outside of said bucket below and substantially parallel to said central portion of said bucket on which said central apron is adapted to roll and a recess formed between said shear pad and said central portion in which the lower edge of said central apron is located before said lip is rotated on to its seating on the upper edge of said bucket.

4. A combination as in claim 1 in which said locking means comprises a locking piece, a part of said locking piece adapted to engage and key together one end of said lip and a part of said bucket adjacent said lip on the inside of said bucket, a second part of said locking piece adapted to pass through a hole in said bucket adjacent said lip, and means on the outside of said bucket to lock together said locking piece, said lip and said bucket.

5. A combination as in claim 1 in which said locking means comprises a key block located on the inside of said bucket, a lug integral with said key block and extending substantially at right angles thereto, a hole in said bucket adjacent an end of said lip to receive said lug, said key block having a shape such as to key together the end of said lip through said end apron to that part of said bucket adjacent thereto and means associated with said lug on the outside of said bucket to lock together said bucket, said lip and said key block.

6. A combination as in claim 1 in which said locking means comprises a key block located on the inside of said bucket, a projecting portion on said key block adapted to engage a step formed on the inside of said lip at the junction of the end of said lip near its upper edge and a portion of said end apron extended beyond said end of said lip, a stepped portion on said key block adapted to engage a complementary stepped portion on said extended portion of said end apron, bearing surfaces on said key block adapted to engage corresponding surfaces on the inside of said bucket, other bearing surfaces on said key block adapted to engage corresponding surfaces on projections formed on the inner surface of said bucket and a recess on the inside surface of said bucket adjacent said lip to receive said key block and said stepped extension of said end apron, a lug integral with said key block and extending substantially at right angles thereto, a hole in said bucket adjacent the end of said lip to receive said lug and means associated with said lug on the outside of said bucket to lock together said bucket, said lip and said key block.

7. A combination as in claim 1 in which said locking means comprises a key block located on the inside of said bucket, a lug integral with said key block and extending substantially at right angles thereto, a hole in said bucket adjacent the end of said lip to receive said lug, said key block having a shape such as to key together the end of said lip through said end apron to that part of said bucket adjacent thereto and means associated with said lug on the outside of said bucket to lock together said bucket, said lip and said key block, said outside locking means comprising a pin, a tapered portion on said pin adapted to pass through a tapered hole in said lug and to be wedged against the outside surface of said bucket and means to lock said pin in position.

8. A combination as in claim 1 in which said locking means comprises a key block located on the inside of said bucket, a projecting portion on said key block adapted to engage a step formed on the inside of said lip at the junction of the end of said lip near its upper edge and a portion of said end apron extended beyond said end of said lip, a stepped portion on said key block adapted to engage a complementary stepped portion on said extended portion of said end apron,

bearing surfaces on said key block adapted to engage corresponding surfaces on the inside of said bucket, other bearing surfaces on said key block adapted to engage corresponding surfaces on projections formed on the inner surface of said bucket and a recess on the inside surface of said bucket adjacent said lip to receive said key block and said stepped extension of said end apron, a lug integral with said key block and extending substantially at right angles thereto, a hole in said bucket adjacent the end of said lip to receive said lug and means associated with said lug on the outside of said bucket to lock together said bucket, said lip and said key block, said outside locking means comprising a pin, a tapered portion on said pin adapted to pass through a tapered hole in said lug and to be wedged against the outside surface of said bucket and means to lock said pin in position.

9. A combination as in claim 1 in which said locking means comprises a key block located on the inside of said bucket, a lug integral with said key block and extending substantially at right angles thereto, a hole in said bucket adjacent the end of said lip to receive said lug, said key block having a shape such as to key together the end of said lip through said end apron to that part of said bucket adjacent thereto and means associated with said lug on the outside of said bucket to lock together said bucket, said lip and said key block, said outside locking means comprising a pin, a tapered portion on said pin adapted to pass through a tapered hole in said lug, a second lug integral with and on the outside surface of said bucket adjacent said lip, a hole in said second lug through which said pin also passes and means to lock said pin in position.

10. A combination as in claim 1 in which said locking means comprises a key block located on the inside of said bucket, a projecting portion on said key block adapted to engage a step formed on the inside of said lip at the junction of the end of said lip near its upper edge and a portion of said end apron extended beyond said end of said lip, a stepped portion on said key block adapted to engage a complementary stepped portion on said extended portion of said end apron, bearing surfaces on said key block adapted to engage corresponding surfaces on the inside of said bucket, other bearing surfaces on said key block adapted to engage corresponding surfaces on projections formed on the inner surface of said bucket and a recess on the inside surface of said bucket adjacent said lip to receive said key block and said stepped extension of said end apron, a lug integral with said key block and extending substantially at right angles thereto, a hole in said bucket adjacent the end of said lip to receive said lug and means associated with said lug on the outside of said bucket to lock together said bucket, said lip and said key block, said outside locking means comprising a pin, a tapered portion on said pin adapted to pass through a tapered hole in said lug, a second lug integral with and on the outside surface of said bucket adjacent said lip, a hole in said second lug through which said pin also passes and means to lock said pin in position.

11. A combination as in claim 1 said locking means comprising a headed threaded pin, a recess formed partly in the inside surface of the end of said lip and its associated end apron and partly in the adjacent inside surface of said bucket to receive the head of said pin, a hole

formed partly in the end of said lip and its associated end apron and partly in said bucket adjacent said lip to receive the shaft of said pin and means associated with said pin on the outside of said bucket to lock together said lip and said bucket.

12. A combination including a dredge bucket, a detachable bucket lip, a seating on part of the upper edge of said bucket to receive a lower edge of said bucket lip, an integral central apron depending from the outside of the lower edge of said lip and being hooked in cross section, a complementary central portion on the outside of said dredge bucket near its upper edge and which is engaged by said central apron and on which said central apron can roll, integral end aprons depending from the inside of the lower edge of said lip, each said end apron fitting inside said dredge bucket when in operative position, and means for locking said lip to said bucket near each end of said lip, said locking means comprising a key block located on the inside of said bucket, a projecting portion on said key block adapted to engage a step formed on the inside of said lip at the junction of the end of said lip near its upper edge and a portion of said end apron extended beyond said end of said lip, a stepped portion on said key block adapted to engage a complementary stepped portion on said extended portion of said end apron, bearing surfaces on said key block adapted to engage corresponding surfaces on the inside of said bucket, other bearing surfaces on said key block adapted to engage corresponding surfaces on projections formed on the inner surface of said bucket and a recess on the inside surface of said bucket adjacent said lip to receive said key block and said stepped extension of said end apron, two lugs integral with said key block and extending substantially at right angles thereto, two holes in said bucket adjacent the end of said lip to receive said lugs and means associated with said lugs on the outside of said bucket to lock together said bucket, said lip and said key block, said outside locking means comprising a pin, a tapered portion on said pin adapted to pass through a tapered hole in each of said lugs, and means to lock said pin in position wedged against the outside surface of said bucket.

13. A combination including a dredge bucket, a detachable bucket lip, a seating on part of the upper edge of said bucket to receive the lower edge of said bucket lip, an integral central apron depending from the outside of the lower edge of said lip and being hooked in cross section, a complementary central portion on the outside of said dredge bucket near its upper edge and which is engaged by said central apron and on which said central apron can roll, integral end aprons depending from the inside of the lower edge of said lip, each said end apron fitting inside said dredge bucket when in operative position, a shear pad on the outside of said bucket below and substantially parallel to said central portion, a projection on the inside of said bucket near each end of said central apron, a projection on the end of each end apron adjacent said projection on said bucket, a second projection on the inside of said bucket adjacent each end of said lip and a projection on the end of each end apron adjacent the end of said lip which engages said second projection on the inside of said bucket, and means for locking said lip to said bucket near each end of said lip.

14. A combination as in claim 13 in which said

locking means comprises a key block located on the inside of said bucket adjacent to a respective end of said lip and having a projecting portion adapted to engage a step formed on the inside of said lip at the junction of one end of said lip near its upper edge and a portion of said end apron extended beyond said end of said lip, a stepped portion adapted to engage a complementary stepped portion on said extended portion of said end apron, bearing surfaces adapted to engage corresponding surfaces on the inside of said bucket, other bearing surfaces adapted to engage corresponding surfaces on projections formed on the inner surface of said bucket, and a lug integral therewith and extending substantially at right angles thereto, said bucket having a recess on its inside surface to receive the key block, and said stepped extension of said end apron, and a hole therethrough to receive the lug of the key block, and means associated with

the lug on the outside of said bucket to lock together said bucket, said lip, and said key block, said outside locking means comprising a pin, a tapered portion on said pin adapted to pass through a tapered hole in said lug, a lug integral with and on the outside surface of said bucket adjacent to said lip, a hole in said lug through which said pin also passes and means to lock said pin in position.

MAX KNOBEL.

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