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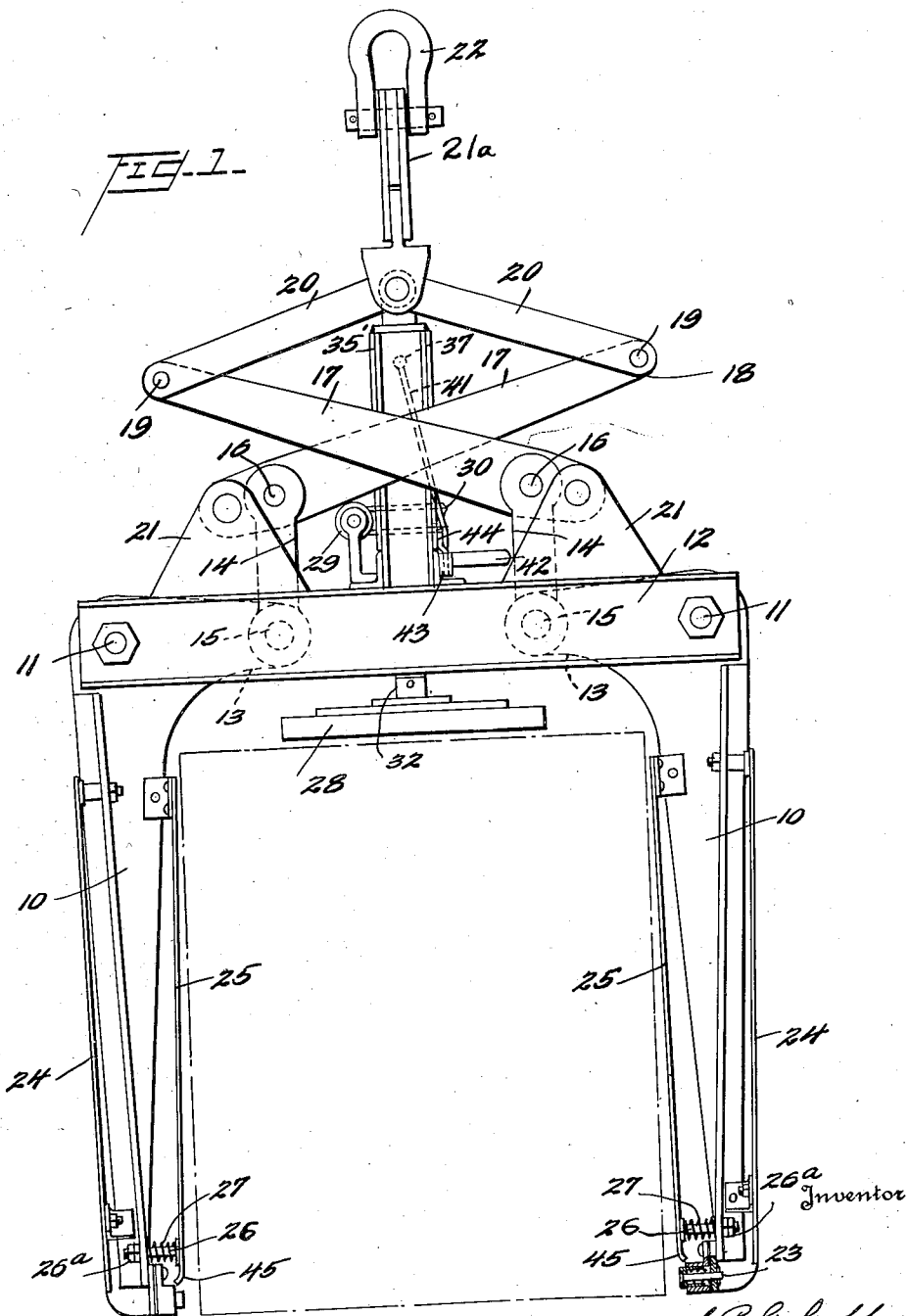
S. POLIAKOFF

BRICK LIFTER

Filed Feb. 7, 1931

1,974,891

3 Sheets-Sheet 1



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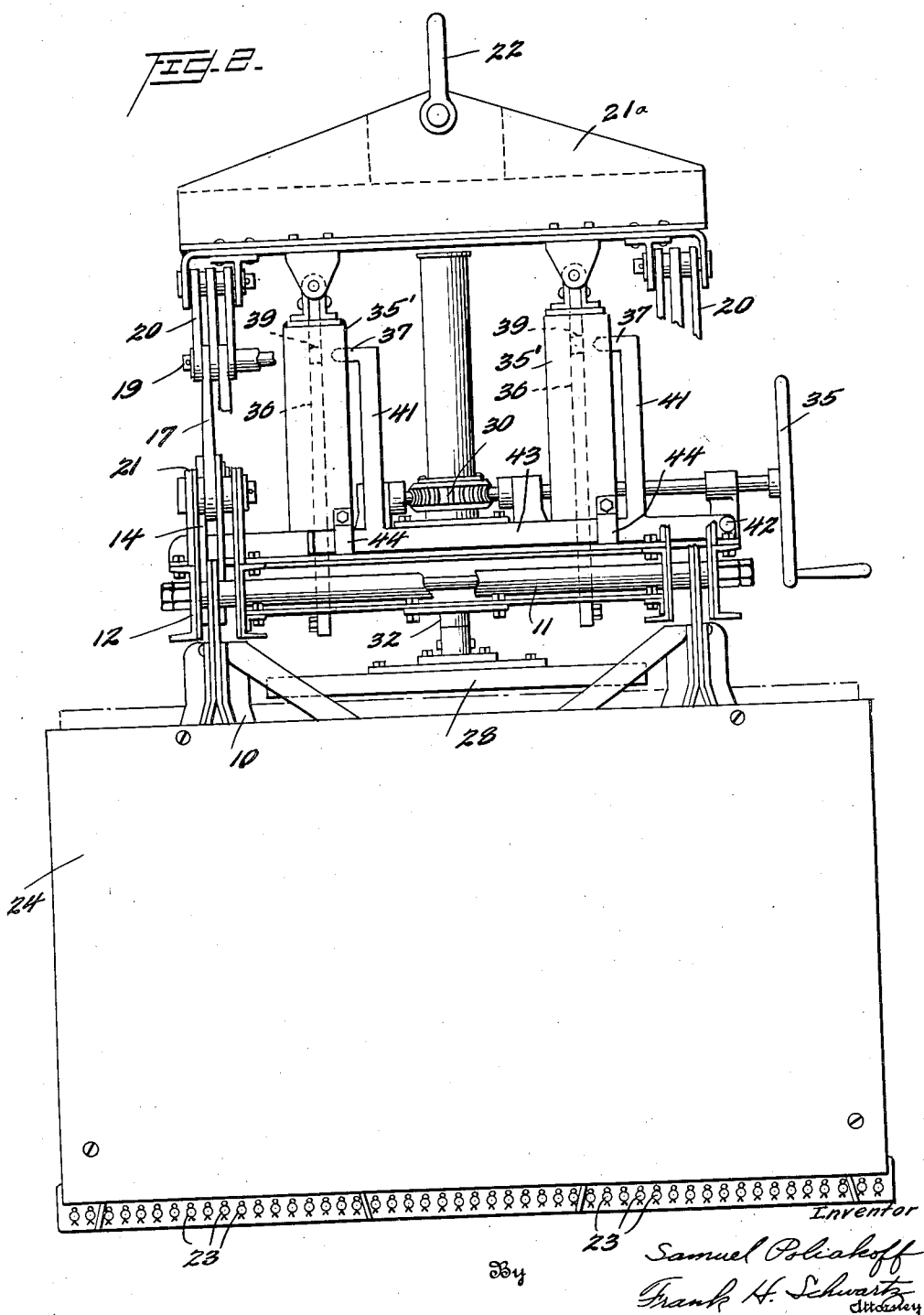
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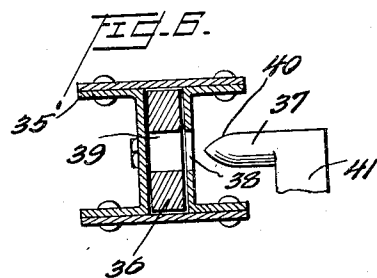
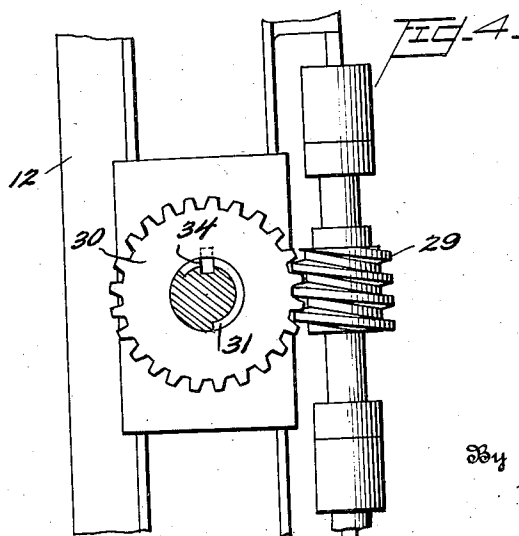
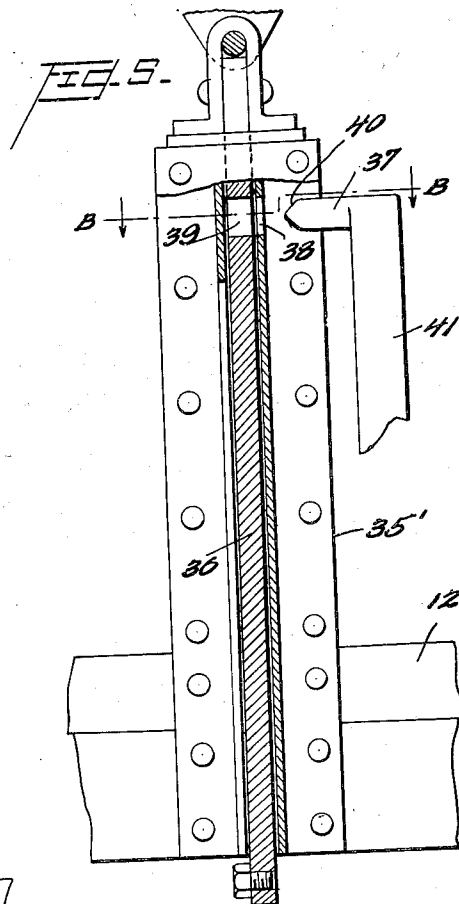
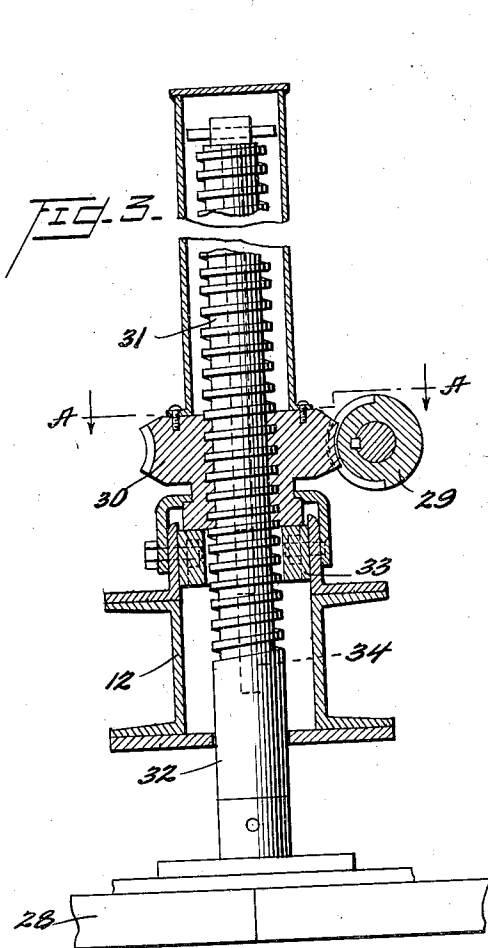
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,974,891

BRICK LIFTER

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Canal Storage Company, Inc., a corporation of
New York

Application February 7, 1931, Serial No. 514,248

12 Claims. (Cl. 294—63)

My invention relates to a brick-handling machine for loading and unloading bricks from such places as a brick kiln to boats, trucks or other types of vehicles.

5 One of the objects is to provide a device that will lift and handle a large number of bricks at once; for instance as many as fourteen to fifteen hundred bricks, at a time.

10 A further object is to provide means to prevent buckling upwards of the load of bricks in the middle, as they are clamped along the bottom tier and lifted.

15 Still another object is to prevent knocking down the pile of bricks as the lifter is lowered into final position for lifting.

20 A still further object is to provide means for locking the gripping arms in their spread apart unloaded position so that the device is ready to be dropped over another pile of bricks without any further adjustment.

25 With these and other objects in view my invention consists of certain novel and peculiar features of construction and combination of parts as will be hereinafter more fully described and particularly pointed out in the claims.

Referring to the drawings for a more complete disclosure of the invention,

Fig. 1 is an end elevation of the device in discharging and ready to load positions;

30 Fig. 2 is a side elevation of device shown in Fig. 1;

Fig. 3 is a detail section of the adjusting means for the top clamp;

Fig. 4 is a section along the line A—A of Fig. 3;

35 Fig. 5 is a detail section of the locking and releasing means for the toggle operating mechanism, and

Fig. 6 is a section on the line B—B of Fig. 5.

40 The brick lifter comprises gripping arms 10 pivoted at their upper ends 11 to the framework 12. The gripping arms 10 have extensions 13 providing a bell crank lever effect. To each of the ends of the extensions 13, a link 14 is pivotally connected at one end 15, and the other end is 45 pivotally connected at 16 to one lever 17 of a lazy tongs 18. The lever 17 is pivotally connected at one end 19 to another link 20 of the lazy tongs, and at the other end to a bracket 21 rigidly mounted on the framework 12. The upper end 50 of the link 20 is pivotally connected to the lifting yoke 21a which carries the bail 22 for connection with a hoisting mechanism. From the above construction, it will be clear that as the lazy tongs is pulled out or extended by lifting the bail 22 upwards, the frame 12 remaining stationary, the

gripping arms will swing toward each other at their lower ends as they pivot about the pivots 11. If, therefore, the device is lowered down over a pile of bricks that are arranged in layers or tiers, the lowest layer of bricks will be pressed and held 60 so tightly together that the complete pile of bricks can be lifted, transported and deposited at any nearby point. For tightly and yet somewhat resiliently holding the lower layer of bricks, the pins 23 which engage therewith are resiliently held in 65 position. In devices of the size to handle the number of bricks hereinbefore described, there will be about 52 pins on each side in a line along the lower ends of the gripping arms and the springs will have an initial compression of about 70 130 pounds.

The gripping arms are usually made of an open frame work of structural shapes, but this has its disadvantages due to the fact that as the device 75 is lowered into position to grip a pile of bricks, some of the bricks in adjoining piles will be knocked off due to the projections of the structural shapes. Similarly the bricks in the pile about to be lifted might become disarranged and would hit the projecting parts of the gripping 80 arms, thus disarranging the whole pile. In order to overcome these defects, I have applied to the outer side, plates 24 which entirely enclose the outer side of the frame work of the gripping 85 arms. To the inner side, I have applied plates 25, that are riveted to the gripping arms at their upper ends and at their lower ends are resiliently held in position by means of bolts 26 surrounded by springs 27 and adjusting nuts 26a, the bolts 26 90 being adapted to reciprocate in the frame work of the gripping arms. As the upper end of each plate 25 is riveted to an arm 10 by a single rivet, the riveted connection is also a pivoted connection.

As the gripping arms move towards each other, 95 over a pile of bricks, the plates 25 will aline any bricks that are out of alignment in the pile. It will be clear too that all projections are eliminated from the gripping arms so that any bricks will not be thrown out of alignment by projections 100 on the gripping arms.

In order to prevent the bricks from buckling upwards as they are being lifted, a top clamp 28 105 is provided, which can be vertically adjusted through the medium of a worm 29 and a worm wheel 30 which latter engages the threaded portion 31 of the rod 32, that is connected to the clamp 28. The splined nut 33 is stationary relative to the frame work 12, the spline of the nut 110 engaging the groove 34, so that rotation of the

hand wheel 35, vertically adjusts the top clamp 28. When about to lift a pile of bricks the top clamp is set down hard against the top of the pile of bricks.

- 5 It becomes desirable at times to lock the lazy
tongs and the gripping arms in the position where
the bricks have just been discharged and when
about to be lowered over another pile of bricks.
For this purpose guides 35' are secured to the
10 main frame work 12 and guide rods 36 reciprocated
in the guides. When the lazy tongs are in
the contracted position shown in Fig. 1, a locking
pin 37 is slid through an aperture 38 in each guide
35' and an aligning aperture 39 in the guide bar
15 36, to lock the two together. The pins are suitably
rounded at their ends 40 to permit easy entrance
into the said apertures. The pins 37 form a part
of the rods 41 which are connected together at
their lower ends by a bar 43, which bar slides in
20 guides 44 carried by the main frame work and is
provided with an operating handle 42.

The lower edge of the inner plate is curved inward slightly as shown at 45, so that when any brick is projecting out, the plate as it moves downwardly will force it back into position.

- 25 In a pile of bricks such as indicated by broken
lines in Figs. 1 and 2 of the drawings, the bricks
will be arranged in layers or tiers, the bricks being
laid on edge with the bricks in successive layers
30 extending at right angles to the bricks of adjacent
layers and with the bricks in the lowest layer extending
in the direction of the horizontal length of
the pile of bricks, in a manner similar to that
shown in the patent to Crum, 1,192,504. Where
35 a pile of bricks consists of approximately 1300
bricks, there will be twelve layers, the lowest layer
being fourteen bricks wide and eight bricks long.
Where a pile of bricks consists of approximately
40 1500 bricks, there will be fourteen layers, the lowest
layer being fourteen bricks wide and eight
bricks long.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics of the invention, and the
45 present embodiment is therefore to be considered
in all respects as illustrative and not restrictive,
the scope of the invention being indicated by the
appended claims rather than the foregoing
description, and all changes which come within
50 the meaning and range of equivalency of the
claims are therefore intended to be embraced
therein.

I claim:

1. In a brick lifting machine, gripping arms
55 adapted to grip a pile of bricks and each gripping
arm having a structural frame work enclosed
with inner and outer plates to provide inner and
outer plane surfaces substantially free from projecting
portions.

- 60 2. In a brick lifting machine, gripping arms
adapted to grip a pile of bricks and each gripping
arm having a structural frame work and a plate
connected to the upper inner side of the frame
work and movably supported at its lower end by
65 the adjacent gripping arm.

3. A brick grab including a frame, jaws for
engagement with the brick, levers constituting
portions of the jaws pivotally supported on the
frame, other levers operatively connected to the
70 first mentioned levers, a lifting head, flexible
devices connecting the head with said last mentioned
levers, means on the frame guiding the vertical
movement of the head, and locking means
operatively engaging the head to secure the latter
75 in lowered position.

4. A brick grab including a frame, jaws pivoted to the frame, levers operating the jaws and pivoted to the frame, tubular guides on the frame, a lifting head, rods on the head movable in said guides, and flexible devices connecting the head 80 and said levers.

5. A brick grab including a frame, jaws pivoted to the frame, levers operating the jaws and pivoted to the frame, tubular guides on the frame, a lifting head, rods on the head movable in said 85 guides, flexible devices connecting the head and said levers, said guides and rods having openings adapted to register when the head is in its lowered position, and locking mechanism including pins movable into said registering openings to 90 secure the head in its lowered position.

6. A brick grab including a frame, jaws pivotally connected to the frame, a head guided in its vertical movement by the frame, and capable of movement relative to the frame, operating means 95 on the frame connected to the jaws, flexible devices connecting the head and said operating means, said flexible means permitting the jaws to swing by gravity to open position when the head is lowered, and means for locking the head in its 100 lowered position.

7. A brick grab including a frame, bell crank levers connected to the frame, plates secured to the inner and outer faces of the bell crank levers and forming with said levers jaws for engagement 105 with a unit-stack of brick, other levers pivoted to the frame above the bell crank levers, links connecting said last mentioned levers at a point near their pivot with the free ends of the bell crank levers, a vertically movable head guided 110 in its movement by the frame, and flexible connecting devices near the head and said last mentioned levers.

8. A brick grab including a frame, bell crank levers connected to the frame, plates secured to the inner and outer faces of the bell crank levers and forming with said levers jaws for engagement 115 with a unit-stack of brick, other levers pivoted to the frame above the bell crank levers, links connecting said last mentioned levers at a point near their pivot with the free ends of the bell crank levers, a vertically movable head guided 120 in its movement by the frame, flexible connecting devices near the head and said last mentioned levers, and means on the frame for locking the head in its lowered position. 125

9. A brick lifting machine designed and adapted to be placed over the top of a pile of bricks at least several bricks long, wide and high, and having a pair of gripping arms designed and adapted 130 to extend down along the opposite sides of said pile, and move relatively toward each other, said arms being provided at their lower ends with gripping portions designed and adapted to grip the opposite sides of the bottom layer of bricks of said pile and lift said pile, the inner face of each gripping arm being provided with a substantially plane, brick-contacting surface substantially free from projections and of a length of at least several bricks and height of at least several bricks, the gripping portion of each gripping arm not extending inwardly substantially beyond the plane 135 of said inner plane surface when the gripping arms are in non-gripping position. 140

10. A brick lifting machine designed and adapted to be placed over the top of a pile of bricks at least several bricks long, wide and high, and having a pair of gripping arms designed and adapted 145 to extend down along the opposite sides of said pile, and move relatively toward each other, said 150

- arms being provided at their lower ends with gripping portions designed and adapted to grip the opposite sides of the bottom layer of bricks of said pile and lift said pile, the inner and outer
- 5 faces of each gripping arm each being provided with a substantially plane surface substantially free from projections and of a length of at least several bricks and height of at least several bricks, the gripping portion of each gripping arm not extending inwardly substantially beyond the plane
- 10 of said inner plane surface when the gripping arms are in non-gripping position.
11. A brick lifting machine designed and adapted to be placed over the top of a pile of bricks at
- 15 least several bricks long, wide and high, and having a pair of gripping arms designed and adapted to extend down along the opposite sides of said pile, and move relatively toward each other, said
- 20 gripping portions designed and adapted to grip the opposite sides of the bottom layer of bricks of said pile and lift said pile, each gripping arm having a structural framework enclosed with inner and outer plates to provide inner and outer plane surfaces substantially free from projecting portions.
12. A brick lifting machine designed and adapted to be placed over the top of a pile of bricks at least several bricks long, wide and high, and having a pair of gripping arms designed and adapted to extend down along the opposite sides of said
- 85 pile, and move relatively toward each other, said arms being provided at their lower ends with gripping portions designed and adapted to grip the opposite sides of the bottom layer of bricks of said
- 90 pile and lift said pile, each gripping arm having a structural framework and a plate connected to the upper inner side of the framework and movable at its lower end toward and from the adjacent gripping arm.
- SAMUEL POLIAKOFF. 95

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