

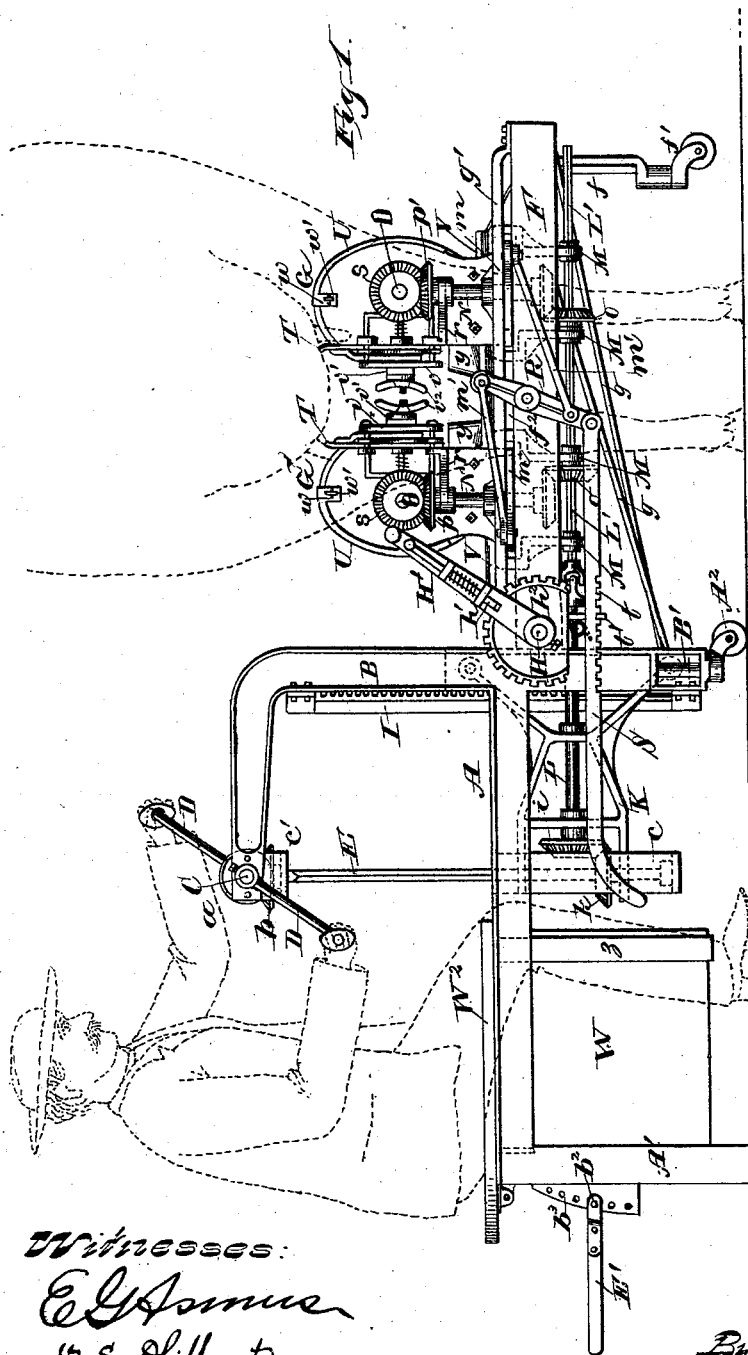
(No Model.)

3 Sheets—Sheet 1.

I. BEYER & A. E. ROHDE.
COW MILKING MACHINE.

No. 347,558.

Patented Aug. 17, 1886.



Witnesses:

E. G. Ames
N. E. Oliphant

Inventors:

Ira Beyer
August E. Rohde

By *Stout & Woodinwood*
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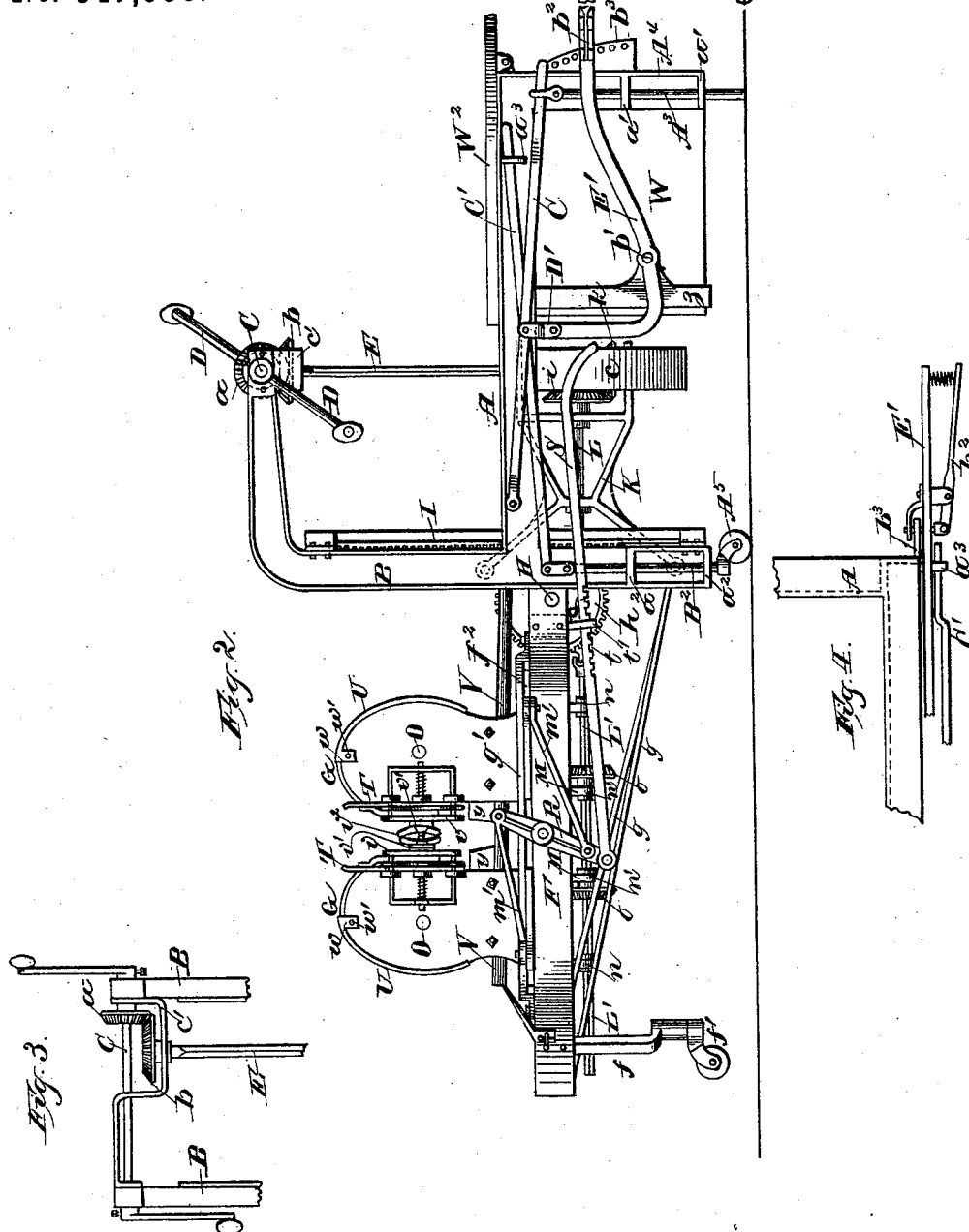
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3 Sheets—Sheet 2.

I. BEYER & A. E. ROHDE.
COW MILKING MACHINE.

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Patented Aug. 17, 1886.



Witnesses:

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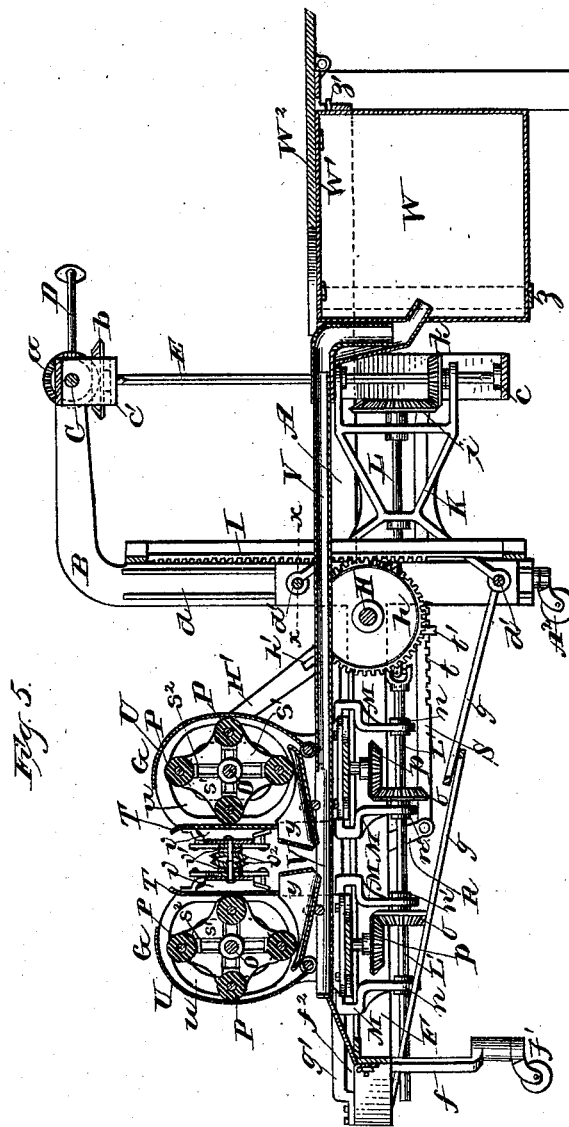
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Patented Aug. 17, 1886.



UNITED STATES PATENT OFFICE.

IRA BEYER AND AUGUST E. ROHDE, OF MISHICOT, WISCONSIN.

COW-MILKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 347,558, dated August 17, 1886.

Application filed March 10, 1886. Serial No. 194,676. (No model.)

To all whom it may concern:

Be it known that we, IRA BEYER and AUGUST E. ROHDE, of Mishicot, in the county of Manitowoc, and in the State of Wisconsin, have invented certain new and useful improvements in Cow-Milking Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to cow-milkers; and it consists in certain peculiarities of construction, as will be hereinafter described with reference to the accompanying drawings, in which—

Figure 1 represents an elevation of one side of our machine in operative position; Fig. 2, a similar view of the opposite side thereof; Fig. 3, a detail view of the driving mechanism, and Fig. 4 a view of a portion of the lever mechanism for canting the machine. Fig. 5 is a longitudinal vertical section of our machine; Fig. 6, a plan view of one of the milking-cylinders; Fig. 7, a detail view of a shaft-bearing; Fig. 8, a partial sectional view of a milking-cylinder head; and Fig. 9, a detail sectional view on line *xx*, Fig. 5.

Referring by letter to the drawings, A represents the main frame of our machine, having vertical angular standards B at its front end. The upper outer ends of the standards B form bearings for a horizontal driving-shaft, C, provided with cranks D, these latter being rotated by the operator of the machine. The shaft C is also provided with a bevel-pinion, *a*, designed to mesh with a similar pinion, *b*, keyed to the upper end of a vertical shaft, E, that is journaled in transverse angular bearings *c c'*, respectively secured to the main frame A and its standards B. The inner faces of the standards are provided with grooves *d*, in which operate anti-friction rollers *e* on the ends of transverse rods *d'* at the rear of a vertically-adjustable frame, F, that supports the milking-cylinders G, and from the front of this frame depends a vertical hanger, *f*, for a pivotal guide-wheel, *f'*. The sides of the frame F have T-shaped ends, that receive the transverse rods *d'*, this frame being suitably braced by cross-rods *g*, extending from the front thereof to the lower one of said transverse rods.

Keyed upon a horizontal shaft, H, journaled

in the sides of the frame F, is a pinion, *h*, that meshes with a vertical rack, I, suitably secured to the front end of the main frame A, and by this rack-and-pinion gear the vertical adjustment of said frame F is effected, to adapt the machine to cows of differing heights. The horizontal shaft H of the frame F is provided with a crank-lever, H', and this latter part has a sliding spring-pawl, *h'*, that engages a segmental rack, *h''*, suitably secured to said frame, to retain the latter in the position to which it may be adjusted.

Secured to the transverse rods *d'* of the frame F is a bracket, K, that is provided with suitable bearings for the vertical shaft E, and a horizontal shaft, L, that carries a bevel-pinion, *i*, designed to mesh with a similar pinion, *k*, this latter part having its bearing in the lower arm of said bracket. The shaft E is preferably square in cross-section, and the hub for the pinion *k* is correspondingly formed upon its interior, so as to slide on said shaft when the frame F is vertically adjusted.

The shaft L is universally joined to a shaft, L', that is also preferably square in cross-section, and has its bearing in bushings *n n'*, operative in hangers M, that are provided with bearings for short vertical shafts N, extended up through transverse plates *m*, that are longitudinally adjustable in the front of the frame F, and form supporting-bases for the milking-cylinders G. The bushings *n n'* for the shaft L' are circular upon their exterior to rotate in the bearings formed by the hangers M, while upon their interior these bushings are squared to fit and slide upon said shaft, this construction being illustrated in detail, Fig. 7. The bushings *n'* form the hubs for bevel-pinions *o*, that engage similar pinions, *p*, on the lower ends of the short shafts N, these latter parts having their bearings in the transverse base-plates *m*, and lugs *r*, laterally extended from the milking-cylinders G.

Keyed to the upper ends of the short shafts N are bevel-pinions *p'*, that mesh with similar pinions, *s*, secured to horizontal shafts O, that have their bearings in the heads of the milking-cylinders and carry slotted plates *s'*, and journaled in slides *s''*, operative in the slotted

plates s' , are a series of horizontal rolls, P, preferably composed of rubber or other yielding material.

The base-plates m , that support the milking-cylinders, are operative in slots f^2 , formed by the sides of the frame F and longitudinal strips g' , bolted thereto. Links m' connect the plates m with arms R. Pivoted to the sides of said frame, and joined to these arms so as to extend rearward and be within reach of the operator, are levers S, provided with rack-teeth t , that are designed to engage stops t' , depending from the sides of the frame F.

By the link-and-arm mechanism just described the milking-cylinders G can be readily adjusted from either or both sides of the machine, and thus brought in line with the teats upon the cow to be milked, thereby adapting said machine to any such animal regardless of the location of teats upon her udder, it being desirable to draw the milk from four teats at one time, said teats being operated upon in pairs.

The heads of the milking-cylinders G are provided upon their interior faces with elliptical tracks u , for anti-friction wheels u' on the journals of the rolls P, and secured to the inner edges of said cylinder-heads are spring-plates v , each having detachably connected thereto a pressure-plate, T, against which the teats of the cow are pressed by said rolls in their rotation, and the tension of these plates T is regulated by spring-fingers v' and clamping-nuts v^2 , operative on screws projecting from the exterior sides of the spring-plates v , and through said fingers, as shown by Fig. 6.

The rolls P are so arranged as that before one thereof has ceased to act upon the teats to force the milk therefrom the roll next in order is brought in play against said teats nearer the udder, this arrangement and action being necessary to the successful operation of milking. By the action of the anti-friction wheels u' on the tracks u the rolls P are gradually forced against the teats with increasing pressure, and thereby exert their full force at the proper point to squeeze out the milk, this operation being accomplished by the automatic radial adjustment of said rolls.

The sides of the milking-cylinders opposite the yielding plates T consist of hinged shields U, provided with clips w , that engage pins or catches w' on the outer side of the cylinder-heads. By the construction above described the parts upon the interior of the cylinders G can be readily reached for the purpose of cleaning, and the plates T are detachable for a like purpose.

The cylinders G are provided with spouts y , that lead into a trough, V, extending rearward and entering a tank, W, that is hung in a stirrup, z , secured to the sides of the main frame A, and this tank is provided with a lug, z' , that engages a recess in the rear end of said frame. The tank W is provided with

a hinged cover, W' , that opens toward one side of the machine, and hinged to the rear end of the frame A is a supplemental cover, W^2 , that forms a seat for the operator, both of these covers being held closed by any suitable locking mechanism.

The machine is supported upon its right side by a stationary leg, A' , at the rear of the frame A, and a pivotal wheel, A^2 , operatively connected to a vertical hanger, B' , permanently secured to the standards B on said side of the machine. The left side of the machine has its support upon a vertical leg, A^3 , loosely operative in brackets a' , projecting from a short standard, A^4 , at the rear end of the frame A, and a pivotal wheel, A^5 , operatively connected to a vertical hanger, B^2 . This vertical hanger B^2 is loosely hung in brackets a^2 , projecting from the standard B on the left side of the machine.

Toggled to the leg A^3 and wheel-hanger B^2 are crossed rods C C', one of which has an end thereof pivotally connected to the frame A, and the other has a free end adapted to slide in a loop, a^3 , on said frame. These rods at their crossing-point are pivoted to a link, D' , that in turn is similarly connected to a lever, E' , fulcrumed at b' . The lever E' is provided at its free end with a spring dog, b^2 , that engages a rack, b^3 , and by operating this lever the brackets a' slide on the parts A^3 and B^2 , and thus the machine is readily canted to conform with the surface upon which it may rest, the dog-and-rack mechanism serving to retain said machine in its adjusted position.

The machine, being mounted on wheels, as above described, can be easily moved about from place to place.

The operator sits upon the tank-cover W^2 , and can readily adjust the machine to the proper position for milking without rising. When the machine is properly adjusted, the operator, from his seat, uses both hands to turn the cranks D, thereby transmitting motion to the rolls P, and the operation of milking a cow is rapidly and easily accomplished.

To prevent the teats of cows from being accidentally caught and pinched between the cylinder-heads and pressure-plates, we may insert a suitable packing at the meeting-point of said parts and extend this packing inward sufficiently far to preclude the possibility of such accident.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a cow-milker, a driving-shaft provided with cranks and a beveled pinion, a vertical shaft having its upper end provided with a pinion arranged to mesh with the one on the driving-shaft, and its lower end also provided with a pinion, in combination with a longitudinal shaft composed of two universally-jointed sections respectively geared to the main vertical shaft and to short vertical shafts having gear-connection with horizontal shafts journaled in the milking-cylinder heads and car-

rying a series of loosely-journaled rolls, and a yielding pressure-plate held normally against the inner edges of said cylinder-heads, as set forth.

5 2. In a cow-milker, a main frame, a vertically-adjustable frame auxiliary to the main one, and provided with adjustable base-plates having the milking apparatus mounted thereon, and means, substantially as described, for
10 operating said apparatus, in combination with a removable tank supported in the main frame and having a trough-connection with the milking apparatus, and an auxiliary cover for the tank, hinged to said main frame and arranged
15 to form a seat for the operator, as set forth.

3. In a cow-milker, a main frame, a vertically-adjustable frame auxiliary to the main one, transverse base-plates adjustably operative in the latter frame, and a milking apparatus supported by said plates, in combination
20 with an adjusting mechanism consisting of arms pivotally connected to the sides of the auxiliary frame, suitable links connecting the arms and adjacent free ends of the base-plates,
25 and horizontal levers pivotally connected to said arms, as set forth.

4. In a cow-milker, the combination of the main frame, the vertically-adjustable frame auxiliary to the main frame, the sides of said
30 auxiliary frame provided with slots, the adjustable base-plates, and the milking apparatus supported by said base-plates, a lever mechanism consisting of arms pivotally connected to the sides of the auxiliary frame,
35 suitable links connecting the arms, and base-plates and horizontal levers pivotally connected to said arms, and provided with rack-teeth adapted to engage a depending stop, as set forth.

5. In a cow-milker, the combination of a main frame having one side thereof provided with a loosely-hung leg and pivot-wheel hanger, and the other side of said frame provided with a stationary leg and pivot-wheel
45 hanger, a canting mechanism consisting of two crossed rods, each having one end toggled to the loose leg and wheel-hanger, a link pivotally united to the bars at their crossing-point, and a lever similarly united to the link
50 and fulcrumed to the main frame, a vertically-adjustable frame auxiliary to said main frame, and provided with adjustable transverse base-plates, milking-cylinders supported by the base-plates and internally provided with a series of revolving rolls, yielding pressure-plates held normally against the inner edges
55 of the cylinder-heads, and means to cause said rolls to successively exert their greatest pressure at a given point, as set forth.

6. In a cow-milker, the combination of the main frame, the vertically-adjustable frame auxiliary to the main one, the milking-cylinders supported on transverse base-plates adjustable in said auxiliary frame, a universally
65 joined sectional shafting hung in bearings that depend from the base-plates, a main shaft operative in the main frame and geared to the

sectional one, horizontal shafts having their bearings in the cylinder-heads and carrying
70 slotted plates, a series of rolls journaled in said plates, and suitable shaft-and-gear mechanism uniting these horizontal shafts with said sectional one, as set forth.

7. In a cow-milker, the combination of the main frame, the vertically-adjustable frame
75 auxiliary to said main one, and having its sides provided with T-shaped rear ends, transverse rods uniting said ends, and a bracket secured to these rods, a vertical main shaft and a sectional horizontal shaft, each having a
80 bearing in said bracket, adjustable transverse plates operative in the auxiliary frame, the milking-cylinders supported on said plates, revolving shafts mounted in the cylinder-heads and carrying plates, a series of pressure-rolls journaled in these plates, pressure-plates held normally against the inner edges of said
85 cylinder-heads, and suitable gear mechanism uniting the sectional shaft with those of the milking-cylinders, as set forth.

8. In a cow-milker, the combination of the milking-cylinders, each consisting of heads having internal elliptical tracks provided with bearings, a horizontal revolving shaft mounted
95 in said bearings and carrying slotted plates, a series of rolls loosely journaled in said plates and carrying anti-friction wheels adapted to operate in the tracks of the cylinder-heads, and a yielding pressure-plate held normally against the inner edges of said cylinder-heads,
100 as set forth.

9. In a cow-milker, the combination of the milking-cylinders, a central horizontal shaft journaled in cylinder-heads and provided with slotted plates, a series of yielding rolls
105 carried by said plates, means to cause said rolls to successively exert their greatest pressure at a given point, and a yielding pressure-plate detachably connected to said cylinder-heads against their inner edges, as set forth.

10. In a cow-milker, the combination of the milking-cylinders, a central horizontal shaft mounted in each cylinder, slotted plates carried by each of said shafts, slides mounted in
115 said plates, and pressure-rolls having bearings in said slides and provided with anti-friction wheels upon their journals, elliptical tracks upon the inner faces of the cylinder-heads, and spring pressure-plates held normally against the inner edges of said cylinder-heads, as set forth.

11. In a cow-milker, the milking-cylinders provided with spring-plates having projecting screws, pressure-plates detachably connected to the spring-plates, spring-fingers operative
125 against said spring-plates, and clamping-nuts operative on the projecting screws and against said fingers, in combination with yielding pressure-rolls carried by slotted plates secured to transverse shafts, having their bearings in the cylinder-heads, and means to cause
130 said rolls to successively exert their greatest pressure at a given point, as set forth.

12. In a cow-milker, the combination, with

the main frame and vertically - adjustable
frame auxiliary to the main one, of a pair of
milking - cylinders, each provided with a
hinged shield, detachable pressure-plate, and
5 spout leading to a delivery-trough, a series of
yielding automatically-adjustable rolls re-
volved within said cylinders, transverse base-
plates supporting the latter and adjustable to
and from each other within the auxiliary
10 frame, a suitable shaft-and-gear mechanism
for transmitting motion to the yielding rolls,
and a receiving-tank connected to the deliv-

ery-trough and arranged to form a seat for
the operator, as set forth.

In testimony that we claim the foregoing we 15
have hereunto set our hands, at Milwaukee,
in the county of Milwaukee and State of Wis-
consin, in the presence of two witnesses.

IRA BEYER.

AUGUST E. ROHDE.

Witnesses:

H. G. UNDERWOOD,
MAURICE F. FREAR.