No. 889,830. PATENTED JUNE 2, 1908.

W. A. VAN BERKEL.

GRINDING DEVICE FOR SHARPENING THE ROTARY CIRCULAR KNIVES OF MEAT SLICING MACHINES AND THE LIKE.

APPLICATION FILED JULY 27, 1905. 2 SHEETS—SHEET 1.

Fig. 1.

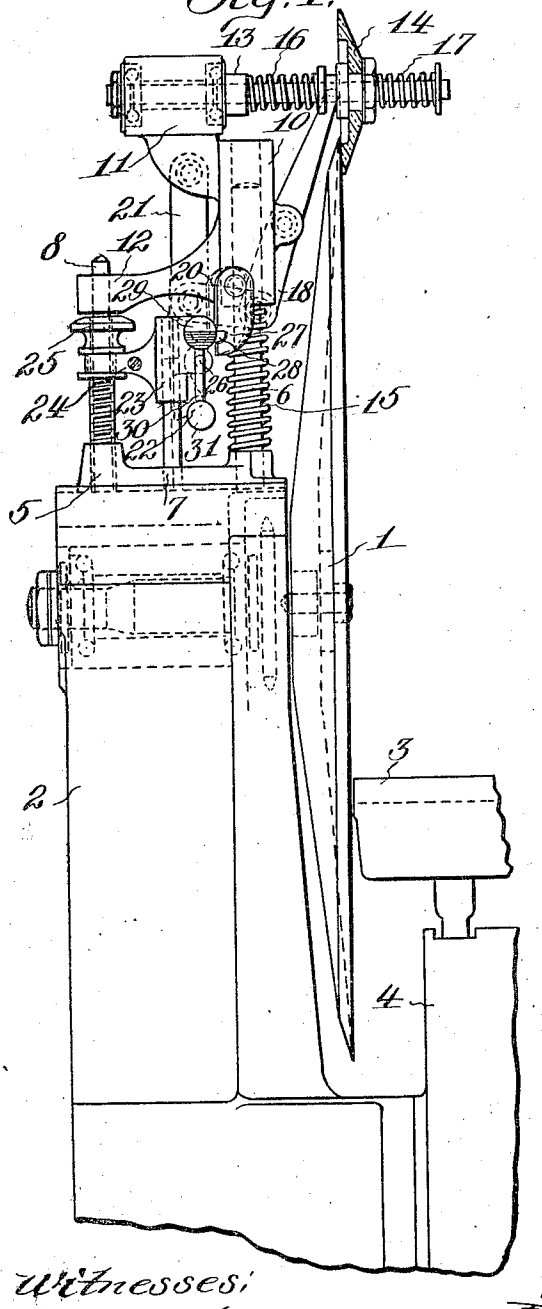
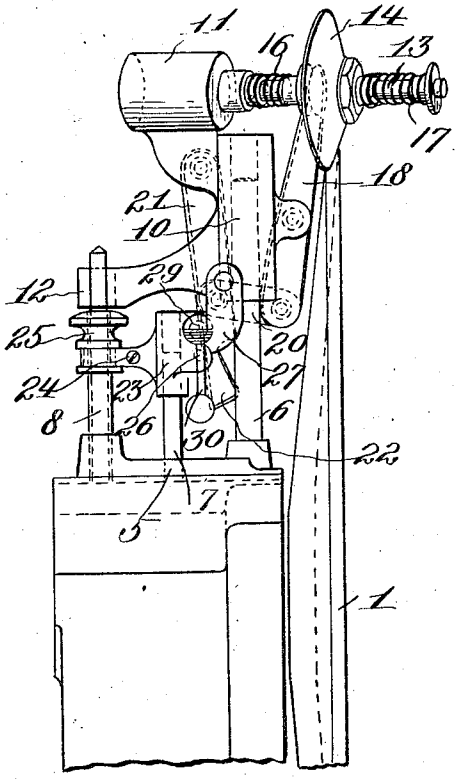


Fig. 4.



Witnesses:
C. F. Kesler
J. B. Keller

Inventor
Wilhelmus A. van Berkel
By
James L. Norris
Atty.

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GRINDING DEVICE FOR SHARPENING THE ROTARY CIRCULAR KNIVES OF MEAT SLICING MACHINES AND THE LIKE.

APPLICATION FILED JULY 27, 1905.

2 SHEETS—SHEET 2.

Fig. 2.

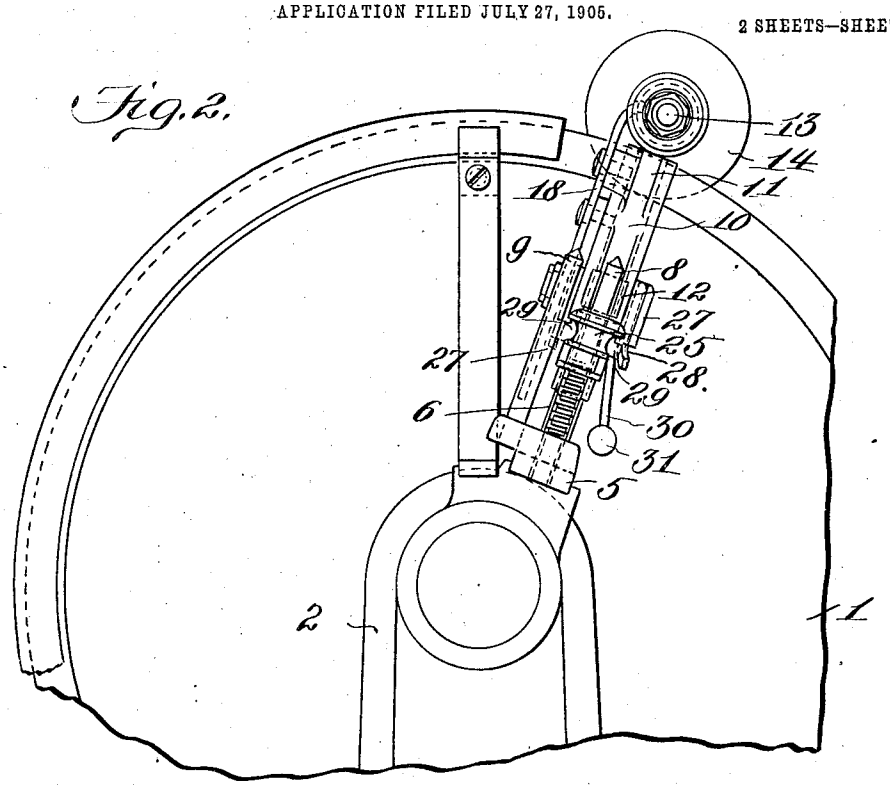


Fig. 3.

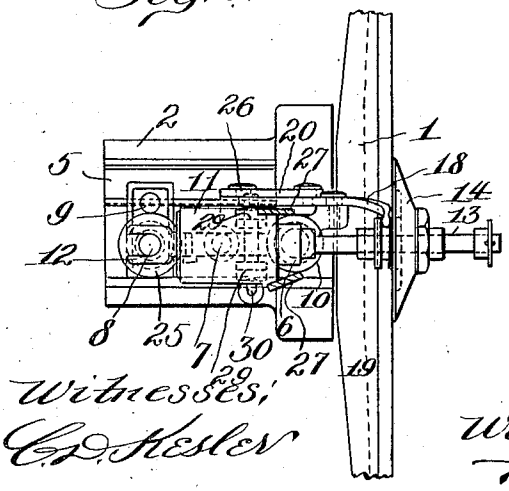
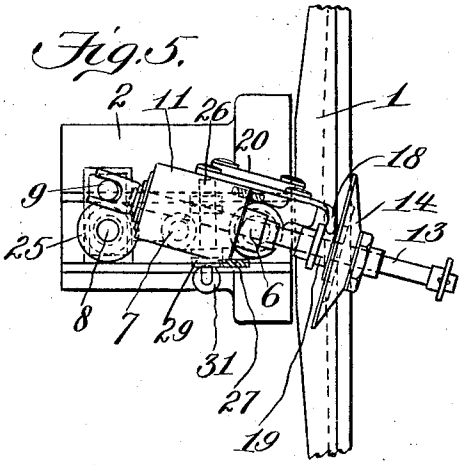


Fig. 5.



Witnesses:

C. D. Kesler

J. B. Kelly

Inventor

Wilhelmus A. van Berkel

By James L. Norris

Atty.

UNITED STATES PATENT OFFICE.

WILHELMUS ADRIANUS VAN BERKEL, OF ROTTERDAM, NETHERLANDS.

GRINDING DEVICE FOR SHARPENING THE ROTARY CIRCULAR KNIVES OF MEAT-SLICING MACHINES AND THE LIKE.

No. 889,830. Specification of Letters Patent. Patented June 2, 1908.

Application filed July 27, 1905. Serial No. 271,513.

To all whom it may concern:

Be it known that I, WILHELMUS ADRIANUS VAN BERKEL, a subject of the Queen of the Netherlands, residing at Rotterdam, 56 Boezemsingel, Netherlands, have invented certain new and useful Improvements in Grinding Devices for Sharpening the Rotary Circular Knives of Meat-Slicing Machines and the Like, of which the following is a specification.

This invention relates to an improvement in meat slicing machines with rotary circular knives and has for its object to provide a device which allows of the knife being sharpened in the simplest manner on the machine itself and which after use may be again thrown out of action or lifted off.

The grinding device for sharpening the circular knife consists of a single peculiarly profiled emery wheel displaceably mounted between two side springs, which emery wheel is pressed by the pressure of the springs against the circular knife and thereby set in rotation by friction against the rotating knife and thus sharpens the latter.

The device is so arranged that it may be placed either against the inner or the outer side of the knife against the cutting edge, on the outside in an oblique position to the knife surface, and on the inside in a position parallel with the knife surface.

The position of the emery wheel when out of action is such that when the sharpening device is pressed downwards the wheel bears on the outside against the circular knife while the sharpening of the inner side necessitates a displacement of the device on its frame, which displacement when the sharpening device is pressed down causes a displacement of the grinding wheel up to the inner side of the circular knife.

A stop mechanism is also provided into which the sharpening device springs in both positions and is retained, and which may be released by a simple hand movement, whereupon the grinding wheel is rendered entirely free of the knife edge.

The device is screwed on the frame of the slicing machine near the protective plate for the knife.

The device is shown in the accompanying drawings:—Figure 1 being a side view; Fig. 2 a front view; and Fig. 3 a plan view when the emery wheel is sharpening the circular knife on the inside; while Fig. 4 is a side view; and Fig. 5 a top view of the position of the emery wheel when it is caused to bear against the outside of the circular knife. Fig. 1 shows how the circular knife 1 is arranged on the bearing support 2 in front of the reciprocated meat table 3 on the table frame.

The sharpening device is firmly screwed on the top of this bearing support 2. This device consists of a bed-plate 5 having four upright pins, of which the one 6 lying next to the circular knife, serves for receiving the sharpening device which is loosely placed thereon, the next 7 (Fig. 1) and the next 8 lying behind it for receiving the stop mechanism, and the next 9 which is placed at the side of the upright pin 8 (Figs. 3 and 5) for bringing the sharpening device into the position in which the outside of the circular knife is ground or sharpened.

The actual sharpening device is composed of a socket 10 with two projections 11 and 12. The spindle 13 of the emery grinding wheel 14 is revolubly mounted on balls in the upper one of these projections (Fig. 1).

The lower projection 12 is forked at its lower end (Figs. 3 and 5) and serves for adjusting the grinding device, which is loosely mounted on the pin 6, either onto the pin 8 for sharpening the inner side of the circular knife (Figs. 1, 2 and 3), or on the pin 9 for sharpening the outside of the circular knife (Figs. 4 and 5). The device also rests on a spiral spring 15 wound round the pin 6, the pressure of which spring is so calculated that it lifts the sharpening device when out of action above the knife disk.

The emery wheel is mounted on a spindle 13 between two spiral springs 16 and 17 which allow of a lateral displacement of the wheel, and hold it in a position in which when depressed its beveled edge bears against the beveled outer side of the circular knife (Figs. 4 and 5). The forked projection 12 then lies round the pin 9.

Now in order to bring the emery wheel against the inside of the knife when the device is placed on the pin 8 (Figs. 1–3), in which position the inner side of the circular knife is sharpened, that is to say in order to laterally displace the emery wheel on its spindle 13, the following arrangement is adopted:—A double-armed lever 18 is pivotally mounted on the socket 10. Its upper end engages in a groove 19 in the ring body on which the emery wheel is secured and its lower end is

connected by means of a drawbar 20 to a suspending link 21, the lower edge 22 of which is formed as a projection or tooth, see Figs. 1 and 4.

A projection is provided laterally on the stop mechanism 23 which is mounted on the pin 7 and may be adjusted by means of a set screw 25 on the pin 6 to the necessary position as regards height and held in this position by means of a clamp screw 24. Now if the device be placed on the pins 6 and 8 and allowed to rest freely on the spiral spring 15, the emery wheel is located above the circular knife on the left hand (outer side) thereof (Fig. 1).

Now if the device be pressed down the projection 22 at the lower end of the link 21 encounters a pin 26 located at the same side of the stop mechanism 23 (Fig. 1) and thereby presses the link 21 aside, whereby the double-armed lever 18 is turned and the emery wheel displaced on its spindle to the right (Fig. 1) until it has reached the inner side of the knife. A further depression releases the projection 22 from the pin 26 and the emery wheel is pressed by the spiral spring 17 against the inner side of the circular knife. When the device is lifted off, a displacement in the reverse direction takes place, the wheel again coming into its normal position.

The position of the pin 26 and the width of the projection 22 are so arranged that on the displacement of the wheel it can never strike against the cutting edge of the circular knife. In order to maintain the device in the lowest position, while sharpening the knife, the following arrangement is adopted on the stop mechanism 23. A tongue 27 is formed on both sides of the socket 10. These tongues are provided with a quadrant shaped recess 28. A circular bolt 29 is pivotally mounted on both sides of the stopping device, the upper half of which bolt is removed corresponding to the thickness of the tongue 27. A lever 30 with a counterweight 31 is provided on one side on the bolt, which always tends to maintain the bolt in the position shown in Fig. 1.

Now when the sharpening device is pressed down either the front or the rear tongue 27 encounters the projecting semi-circular half of the bolt 29, turns it and then the recess 28 snaps over said projecting semi-circular half of the bolt which has turned back in its original position (Fig. 4), whereby the sharpening device is firmly connected with the stop mechanism. A simple turning of the bolt on the lever 30 through 90° suffices to again release the tongue, while under the action of the spiral spring 15 the sharpening device is lifted entirely free of the circular knife. The device may either be allowed to remain on the pins until the knife is to be again sharpened, or it may be entirely removed from the slicing machine.

As shown in Figs. 3 and 5 the tongues 27 are arranged in such a way on the socket 10 that when one is held fast by the bolt the other lies entirely free from the opposite bolt and vice versa.

In order to insure an effective sharpening of the inner side, the grinding wheel is recessed in the middle on the flat side, as shown in Fig. 1, in order that the cutting edge of the circular knife may not cut into the emery wheel, and also for sharpening the outside, the position of the grinding wheel to the knife face must be an oblique one (Figs. 4 and 5), as otherwise the cutting edge of the circular knife would cut into the beveled part of the grinding wheel and blunt the circular knife. This position is obtained by mounting the device on the laterally placed pin 9 (Fig. 5) while the whole device is turned a little and assumes an oblique position to the knife surface. The set screw 25 serves as support for the device in order that the grinding wheel may not be depressed too deeply on to the circular knife. As the circular knife wears away, the holding device must be adjusted somewhat lower.

The handling of the apparatus is as follows:—According as the inner or outer side of the circular knife is to be sharpened the device is placed on the pin 8 or the pin 9. In the first case by the projection 22 encountering the pin 26, the emery wheel is displaced to the inner side, and finally the tongue 27 retained by the bolt 29. In the second case the projection does not encounter this pin and the wheel remains on the outside of the circular knife. If the knife be rapidly rotated it will sharpen itself on the wheel which rotates with it. In both cases a simple turning of the bolt 29 suffices to move the device upwards above and entirely free from the knife disk.

I declare that what I claim is:—

1. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising a freely revoluble grinding wheel, a spindle supporting said wheel, springs on said spindle bearing against opposite sides of the wheel, a support for the spindle having a socket, a bed plate, a pin on said bed plate on which the socket of the support is movably mounted, and means for holding the support and socket on the said pin in either one of two positions, to bring the grinding wheel in engagement with either the inner or outer portions of the rotary circular knife.

2. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising a freely revoluble adjustable grinding wheel set in motion by contact with the knife, supports and bearings for said wheel including a spindle for the latter, means for holding the wheel out of contact with the knife, and means engaging opposite sides of the wheel for holding the latter in contact with differ-

ent portions of the knife, the latter means engaging the spindle.

3. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising a freely revoluble grinding wheel set in motion by frictional contact with said knife, adjustable supports and bearings for the wheel, a spindle on which the wheel is laterally movable in opposite directions, and means on the spindle engaging opposite sides of the wheel for maintaining yielding contact of the wheel against either side of the knife.

4. A grinding device for circular knives embodying a support having means for revolubly mounting the knife, a shaft supporting a revoluble grinding wheel capable of movement laterally in two directions along said spindle to enable its opposite sides to bear against either side of the knife, and means for relatively adjusting the grinding wheel in a direction substantially parallel to the plane of the knife.

5. A grinding device for sharpening the rotary knife of a slicing machine, consisting of a grinding disk rotated by frictional contact with the knife, bearings for said disk, a support for the bearings, a bed plate having pins projecting therefrom, one pin adapted to act as a guide for the support, another as a stop, and two others as holding devices for the support, and means for adjusting said support on the first pin.

6. The combination with the rotary knife of a slicing machine, of a rotatable grinding device for sharpening said knife and set in motion by frictional contact with the latter, a supporting spindle for said device, spring means on both sides of the grinding device for holding the grinding device against the knife when in sharpening position, means for raising and lowering the grinding device, lever and link means for holding said device in contact with the knife, and means for adjusting the grinding device to operate on either side of the knife.

7. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising, in combination, a support, a spindle mounted on the support, a grinder laterally movable on the spindle, yielding means acting on one side of the grinder, said yielding means engaging the spindle and means for moving the grinder laterally on the spindle.

8. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising in combination, a support, a spindle mounted on the support, a grinding disk flat on one side and beveled on the other side laterally movable on the spindle, yielding means acting on one side of the grinding disk, yielding means acting on the other side of the grinding disk, means for bringing the flat and beveled sides of the grinding disk in engagement with opposite sides of the knife, and means for moving the grinding disk laterally on the spindle.

9. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising, in combination, a support, a spindle fitted in the support, a grinding disk flat on one side and beveled on the other side and laterally movable on the spindle, said disk being recessed on its flat side, yielding means acting on one side of the grinding disk, yielding means acting on the other side of the grinding disk, and means for moving the grinding disk laterally on the spindle.

10. A grinding device for circular knives embodying a suitable support, means for centering a circular knife thereon, a spindle mounted on the support, a grinding wheel carried by the spindle and movable axially thereof, devices for yieldingly resisting the axial movement of the grinding wheel in both directions, the grinding wheel having a flat surface at one side and a beveled surface on its opposite side adapted to engage with the respective surfaces of the knife, means for moving the grinding wheel into and out of grinding position relatively to the knife, and a device for holding the grinding wheel clear of the knife while the grinding wheel is being moved into inoperative position.

11. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising, in combination, a support, a spindle fitted in the support, a grinder having a sleeve provided with a circumferential groove and laterally movable on the spindle, yielding means acting on one side of the grinder, yielding means acting on the other side of the grinder, said yielding means engaging the spindle, means engaging the groove of the sleeve for moving the latter on the spindle, and means for holding the grinder in position.

12. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising, in combination, a support, a spindle fitted in the support, a grinder having a sleeve provided with a circumferential groove and laterally movable on the spindle, yielding means acting on one side of the grinder, yielding means acting on the other side of the grinder, means coöperating with said sleeve for moving the grinder laterally on the spindle, and a lever mounted on the support for holding the grinder in position.

13. A grinding device for sharpening the rotary circular knife of slicing machines, comprising, in combination, a support, a spindle fitted in the support, a grinding disk flat on one side and beveled on the other side, laterally movable on the spindle, yielding means acting on one side of the grinding disk, yielding means acting on the other side of the grinding disk, means held by the support for moving the grinding disk laterally on the spindle, and fulcrum means on the

support whereby the spindle can be turned horizontally through an angle, so as to bring either the flat face or the beveled face of the grinding disk in position to sharpen the knife.

14. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising, in combination, a support, a spindle fitted in the support, a grinder having a sleeve provided with a circumferential groove and laterally movable on the spindle, yielding means on one side of the grinder, yielding means acting on the other side of the grinder, means held by the support for moving the grinder laterally on the spindle, a lever for holding the grinder in position, and means on the support for locking the lever in position.

15. A grinding device for sharpening the rotary circular knife, of a slicing machine, comprising, in combination, a support, a spindle fitted in the support, a grinding disk flat on one side and beveled on the other side laterally movable on the spindle, yielding means acting on one side of the grinding disk, yielding means acting on the other side of the grinding disk, means for moving the grinding disk on the spindle, means on the support whereby the grinding disk can be moved into one position so that its flat face bears on the knife and into another position so that its beveled face bears on the knife, and means on the support for locking the grinding disk in each position.

16. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising a freely revoluble grinding wheel set in motion by frictional contact with the knife, the wheel having beveled and flat faces, movable supporting means for bringing the beveled face of the wheel into and holding it in contact with the beveled face of the knife, and also for bringing the flat face of the wheel into and holding it in contact with the flat face of the knife, and means mounted on the movable supporting means for holding the wheel out of contact with the knife.

17. The combination with a support for a circular knife, of a grinding device embodying a spindle movable substantially in the plane of the knife, a grinding wheel mounted on the spindle and movable axially thereof in two directions, springs coöperating with the grinding wheel for yieldingly pressing either of its sides in engagement with the corresponding sides of the knife, means for adjusting the spindle to set either of the sides of the grinding wheel in sharpening position relatively to the knife, and a device operating automatically to retain the grinding wheel in sharpening position.

18. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising, in combination, a vertically movable support, a spindle rotatably fitted in the support, a grinder fitted slidably on the spindle, means held by the support for moving the grinder on the spindle, means also engaging the support for holding the grinder in position, yielding means acting on both sides of the grinder, and means for adjusting the support to two positions and holding it in these positions.

19. A grinding device for sharpening the rotary circular knife of a slicing machine, comprising in combination, a bed plate, a support pivotally and slidably fitted on a pin secured in the bed plate, a spring between the support and bed plate, a spindle rotatably fitted in the support, a grinder fitted slidably on the spindle, means engaging the support for moving the grinder on the spindle, means also engaging the support for holding the grinder in position, yielding means acting on both sides of the grinder, and means for adjusting the support to two positions and holding it in these positions to bring the grinder into engagement with opposite sides of the knife.

20. The combination with a support in which a circular knife is revolubly positioned, of a grinding device embodying a spindle adjustable substantially in the plane of the knife, a grinding device mounted thereon having grinding surfaces adapted to engage the opposite sides of the knife and set in motion by frictional contact therewith, means for moving the grinding device into and out of operative position in the plane of the knife, and a catch for retaining the grinding device in operative position embodying a notched tongue and a relatively movable locking bolt adapted to coöperate therewith.

21. The combination with the rotary knife of a slicing machine, of a rotatable grinding device for sharpening said knife and set in motion by frictional contact with the latter, a supporting means for the grinding device having tongues with quadrant-shaped recesses, spring means for holding the grinding device against the knife when in sharpening position, lever and link mechanism for shifting the grinding device on a portion of its support, circular locking bolts to engage the said quadrant-shaped recesses, a counter-weighted lever, coöperating with the said lever and link mechanism, and means coöperating with the supporting means for adjusting the grinding device to operate on either side of the knife.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILHELMUS ADRIANUS VAN BERKEL.

Witnesses:

WILLEM JACOBUS DE GRAAF,

PETRUS VAN BERKEL.