

ANTHOSTOMELLA FUSISPORA SP. NOV. AND A. CYLINDROSPORA SP. NOV. ON COCOS NUCIFERA

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DOROTHY E. SHAW†

ABSTRACT

Anthostomella fusispora sp. nov. and *A. cylindrospora* sp. nov. are described. The former was recorded on coconut in Malaya and New Caledonia and the latter on coconut in Papua.

The two species described herein differ from previously described species of *Anthostomella*. In some respects their morphological characteristics are atypical of the genus, particularly with regard to their large locules and very limited clypei. These characters, however, are assumed to be adaptive features to their specific habitat on the rachis of coconut palms. The presence of a stroma surrounding the perithecial wall, the apically free paraphyses and the presence of periphyses lining the schizogenously formed ostiole are, together with the brown amerospores, characters of the Xylariaceae in general. The immersed uniloculate perithecia place them in the genus *Anthostomella*.

Anthostomella fusispora sp. nov.

The disease on the axis of coconut fronds is visible as extensive and irregular raised areas of the epidermis which is sparsely covered with black dots marking the position of the clypeus and ostiole. The raised areas are due to the formation of black stromata in the ground parenchyma below the outer one or two rings of vascular bundles. Growth of this extensive stroma begins after the dark mycelium from the point of infection has ramified both inter- and intra-cellularly through the outer parenchyma of the axis. Ground parenchyma cells are penetrated through the pits in the cell walls and hyphae normally 3-4u wide narrow to approximately

1u wide to penetrate these pits. Initially small aggregations of thick walled globose cells form a pseudoparenchyma between the vascular bundles and as this increases in size a schizogenously formed cavity develops to form the locule. Growth of the stroma tends to continue until it meets the outer wall of an adjacent stroma developing from another centrum. Between the two locules the walls merge and form what appears to be a pillar of elongated cells. At this stage the stroma has occupied the available space between the outer and inner vascular bundles. The locules are oblong in section and lined with the wall of the perithecium which consists of several layers of thin-walled cells.

In the central region of this curiously shaped locule the upper cells of the stroma grow outwards to form a column which finally ruptures the epidermis and forms a small darkened region around the ostiole. The ostiolar canal develops through the centre of this cone of cells and becomes lined with periphyses. (Plate I).

The asci develop from the basal region and grow upwards between the abundant paraphyses. They are unitunicate, clavate and have a thin wall without an apical ring. They measure 60-85 x 14-20u and possess eight obliquely distichous ascospores.

The ascospores, initially hyaline, soon become straw coloured to light brown; they are smooth, broadly fusoid and occasionally slightly wider above the central region, aseptate and measure 28-37 x 8.5-11u.

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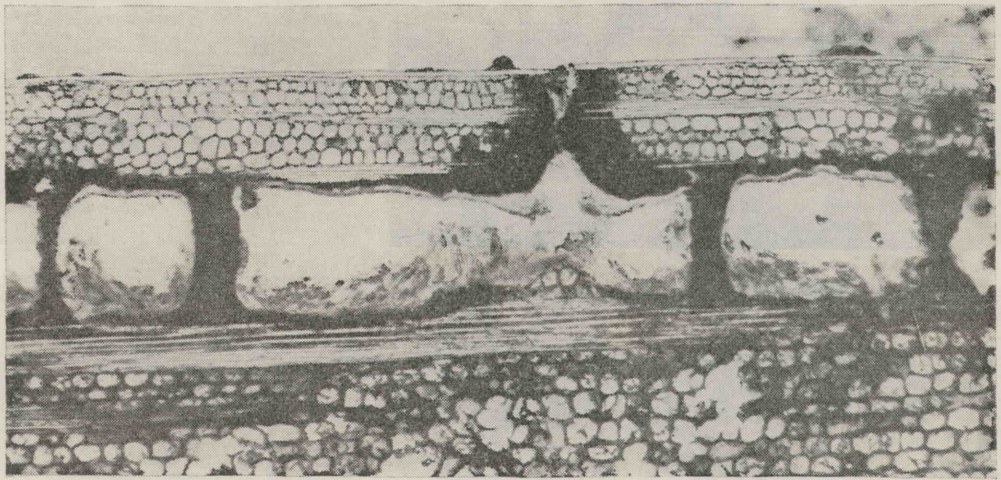
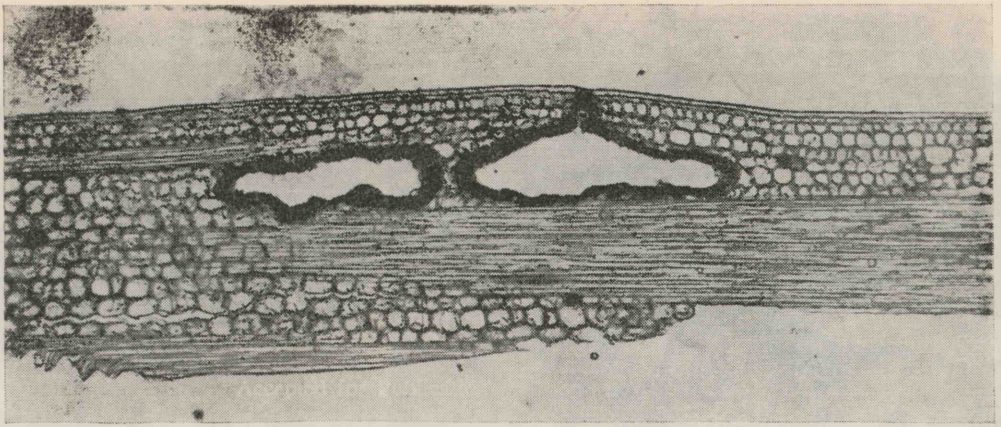


Plate I.— *A. fusispora*. Top: Young perithecial stroma. x 70
 Centre: Mature perithecial stroma. x 70
 Bottom Right: Asci. x 500
 Ascospores. x 800

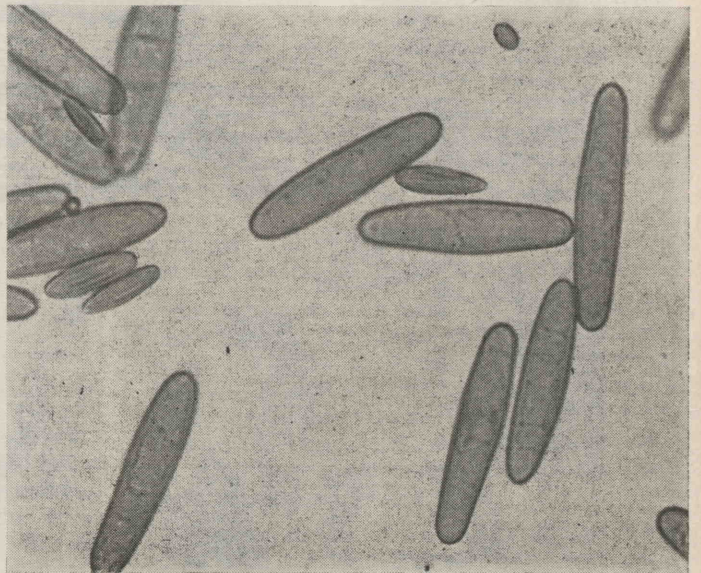
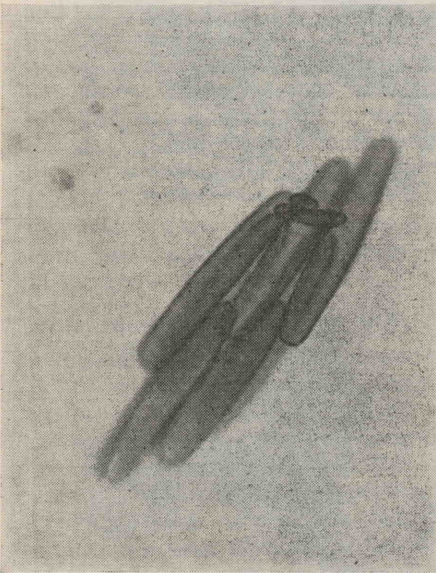
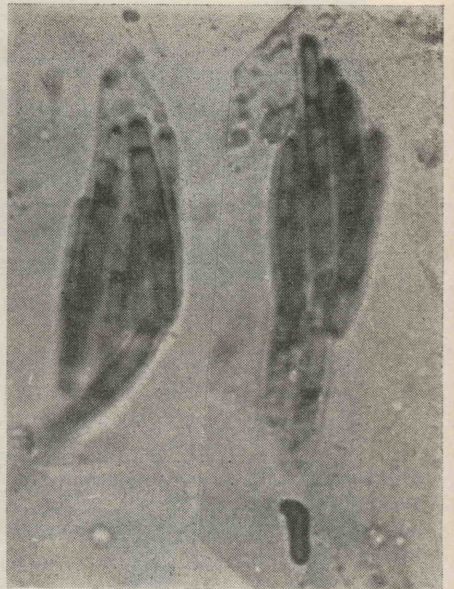
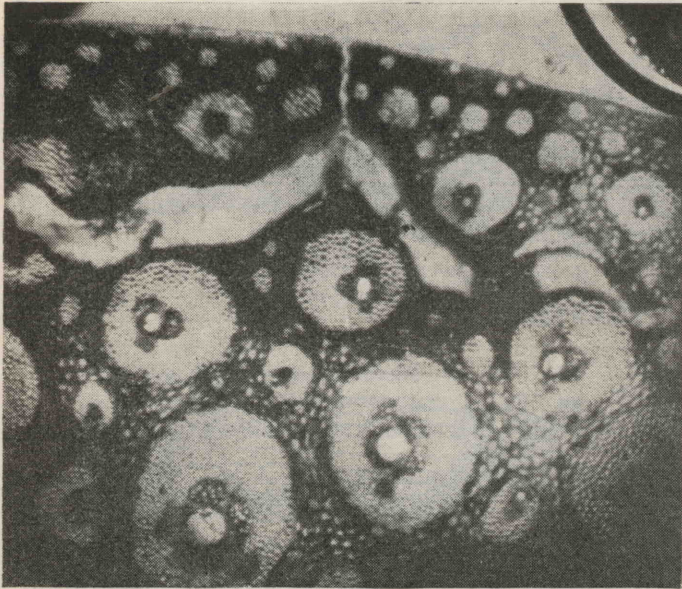


Plate II.—*A. cylindrospora*. Top Left:

Dense stromatic tissues and developing locule. x 40

Top Right:

Immature asci. x 650

Bottom Left:

Ascus contents with three diminutive ascospores. x 650

Bottom Right:

Mature ascospores together with diminutive or abortive spores. x 650

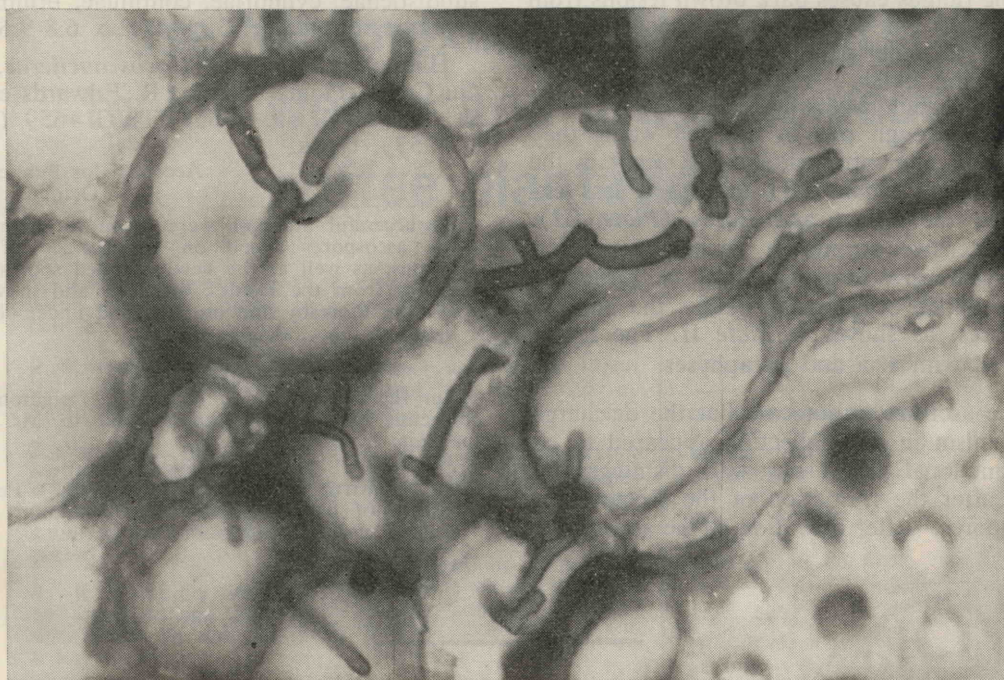
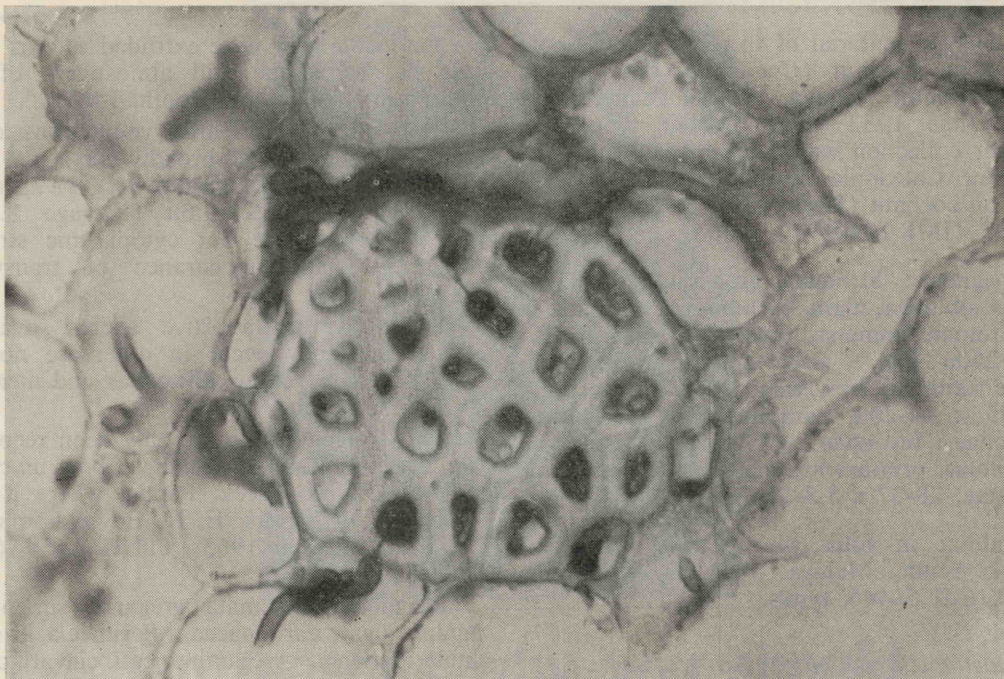


Plate III.—*A. cylindrospora*.

Top: Hyphae in one of the small bundles of fibres. x 500
 Bottom: Inter- and intra-cellular hyphae in parenchyma cells. x 700

The type material of this species was collected on coconut (*Cocos nucifera* L.) at Perak South, Malaya, A. Johnstone, June 1966, June 1953 (IMI 54446) type. A further collection was made by B. Huguenin in New Caledonia during December 1963, also on coconut (Herb. I.F.O. Noumea, N.C. 63212 (IMI 104089)).

Diagnosis: Stromata gregaria, subepidermalia, oblonga, nigra, carbonacea. Perithecia in stromate immersa, oblonga, 1 mm. longa, 200-250u alta. Asci unitunicati, clavati, apice rotundati, brevissime stipitati, octospori, 60-85 x 14-20u, paraphysati. Ascospores distichae, fusoidate vel oblongo-fusoidae, continuae, primum hyalinae deinde brunneae, guttatae, 28-37 x 8.5-11u.

Habitat in foliis vivis *Cocos nuciferae*. Perak South, Malaya. A. Johnston, June 1953, IMI 54446, typus.

Anthostomella cylindrospora sp. nov.

The fungus causes dark brown lesions from one to 30 cm. long when coalesced on the surface of the petiole and permeates the underlying tissue. The hyphae are brown, 3-5u wide but narrowing to 1u or less when passing through pits in the cell walls; they are inter- and intra-cellular and occur in the parenchyma (Plate III) and to a less extent in the xylem and fibres (Plate III). An extensive stroma is developed with a schizogenously formed cavity to form the locule which occasionally bisects the bundles of fibres, as shown in Plate II. The locule is lined with asci and paraphyses.

The asci are unitunicate but the discharge mechanism in this collection appeared to be nonfunctional, the ascus wall disintegrating soon after the formation of the six to eight ascospores. After liberation of the ascospores

in the locule they were extruded as cirri from the ostiole in the still atmosphere of the laboratory (Shaw and Booth, 1967).*

The ascospores are yellow-olivaceous, smooth, cylindrical to broadly ellipsoidal with rounded ends and measure 38.8-47.2 (average 43.2u) by 6.8-9.6u (average 8.5u). They are aseptate but cytoplasmic strands often give the appearance of transverse pseudo-septa.

Diminutive or abortive spores, oval to cylindrical, may occur in otherwise normal asci; they are yellow-olivaceous and measure 9-22.5 x 2.8-5u.

This fungus has so far only been recorded on the petioles of coconut (*Cocos nucifera* L.) at Ou Ou Creek, Papua, where it was collected by Messrs. E. R. Edwards and A. E. Charles, 4.viii.1965, TPNG 4659 (IMI 114957).

Diagnosis: Stromata gregaria, subepidermalia, nigra, carbonacea. Perithecia in stromate immersa. Asci unitunicati, clavati, apice rotundati, 6-8 spori, paraphysati. Ascospores subdistichae, cylindricae, continuae, brunneae, utrinque rotundatae, 38.8-47.2 x 6.8-9.6u.

Habitat in foliis vivis *Cocos nuciferae*, Ou Ou Creek, Papua. coll. E. R. Edwards et al. E. Charles, 4.viii.1965, TPNG 4659 (IMI 114957), typus.

Accepted for Publication
October, 1967.

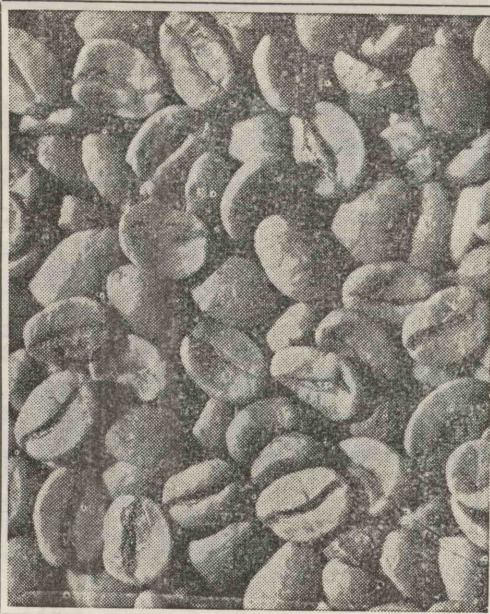
* Unsuccessful attempts were made to germinate the ascospores found on the surface of the lesions, as well as the newly exuded spores and spores from the locules, on PDA and in water at Port Moresby and on agar and under "black light" at the C.M.I.

ACKNOWLEDGEMENTS

Our thanks are due to Mr. F. C. Deighton for correcting the Latin diagnoses and to Mr. Fry for Plate I.

REFERENCE

SHAW, DOROTHY E. AND BOOTH, C., (1967). Petiole disease of coconut in Papua. *Papua and New Guinea agric. J.* (2): 89-93.



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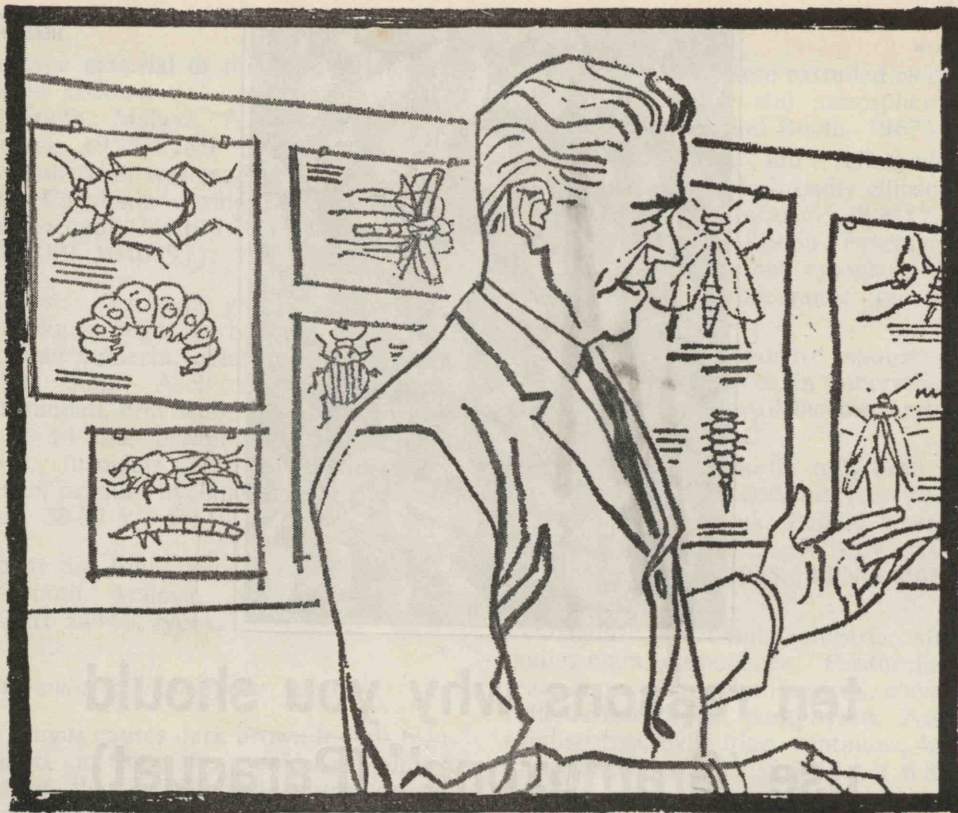
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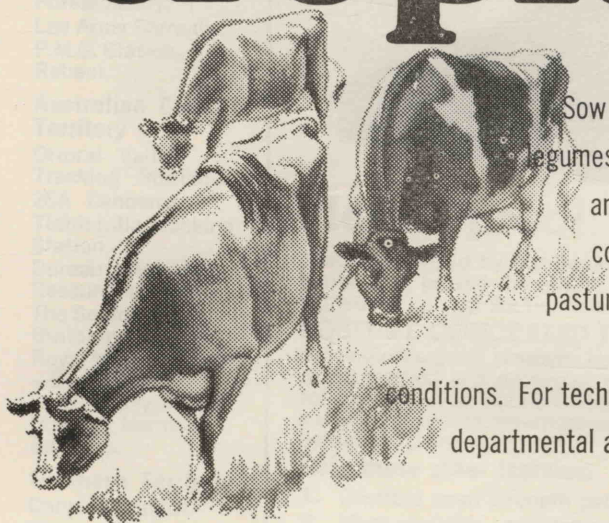
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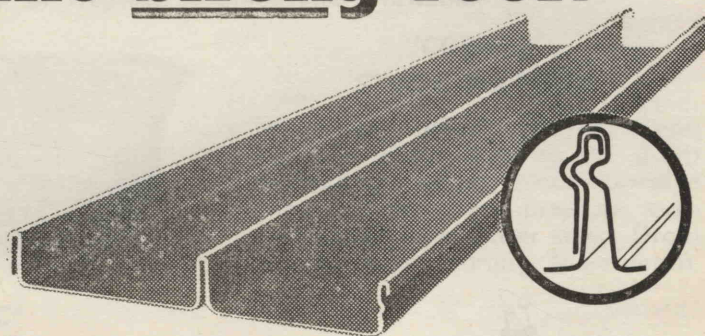
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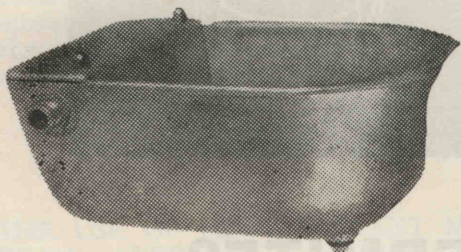
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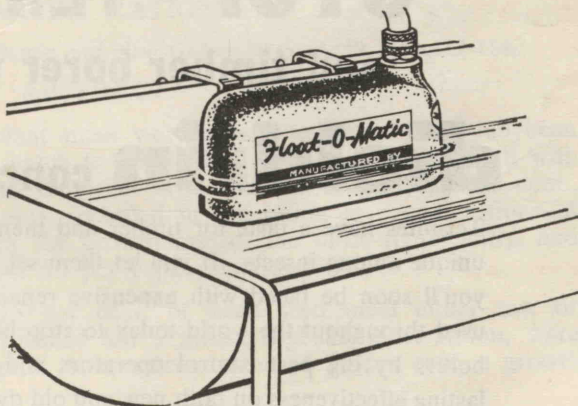
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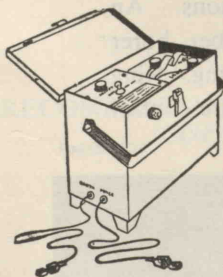
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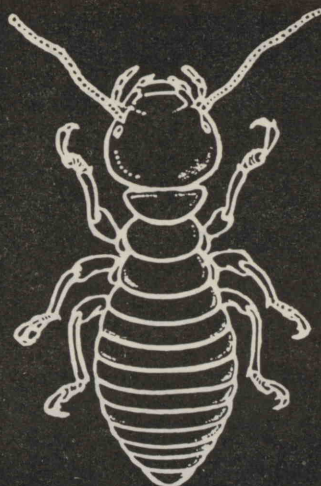
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