

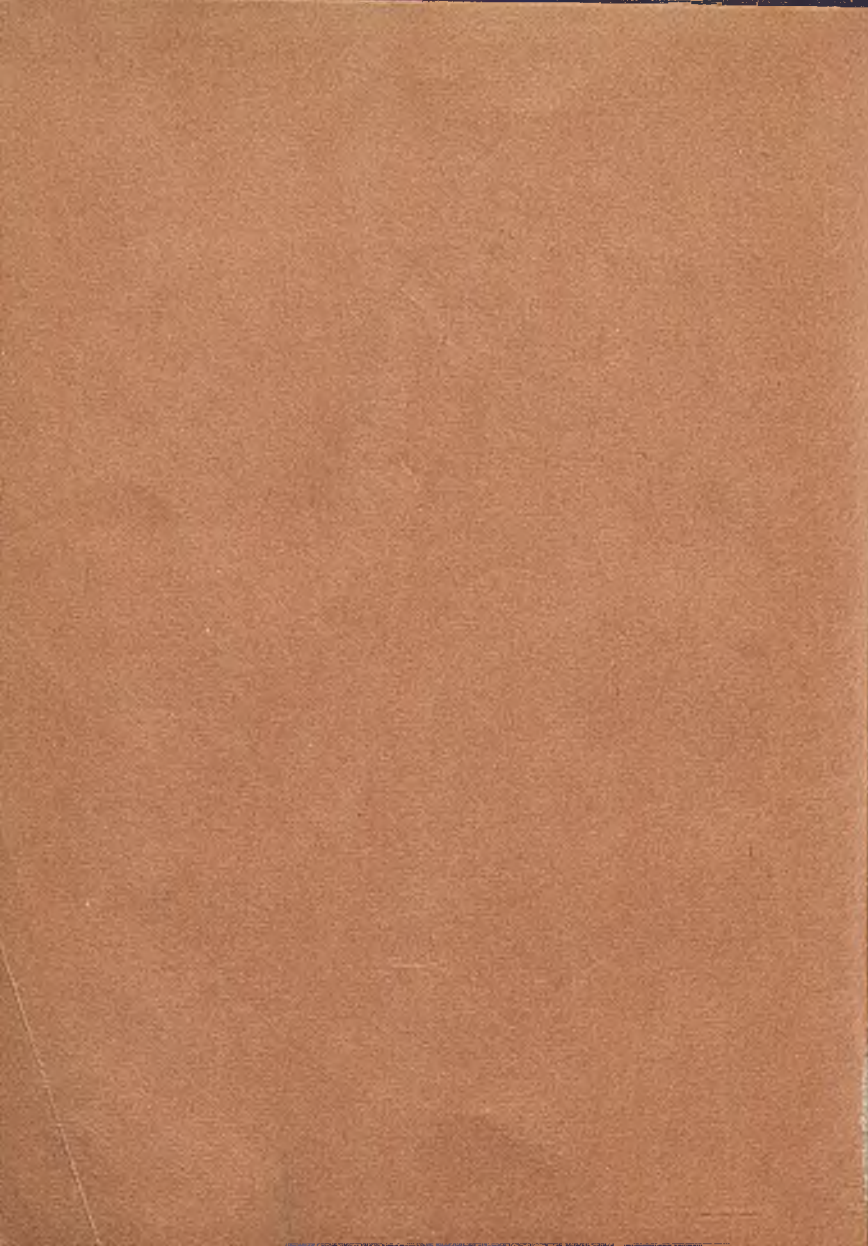
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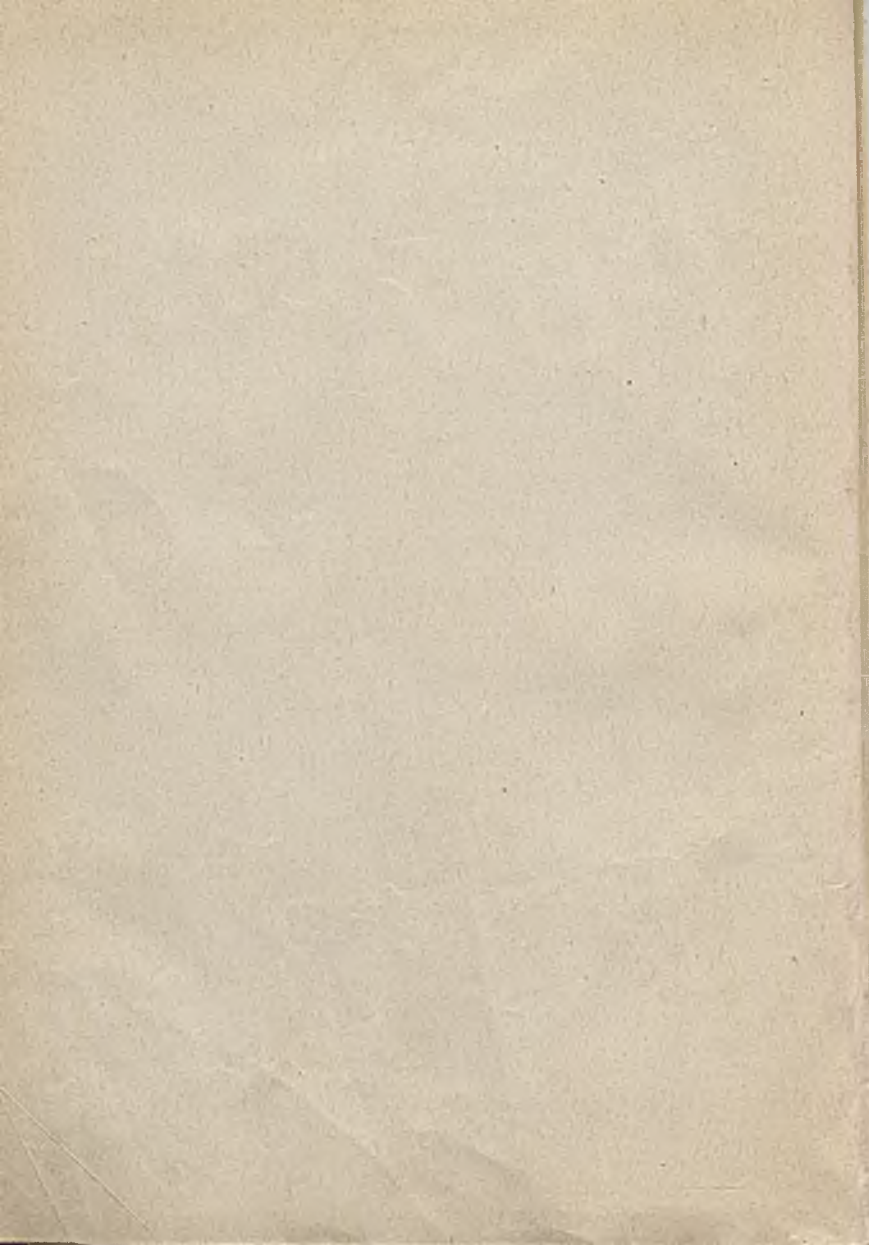
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FRANK D. GRAHAM

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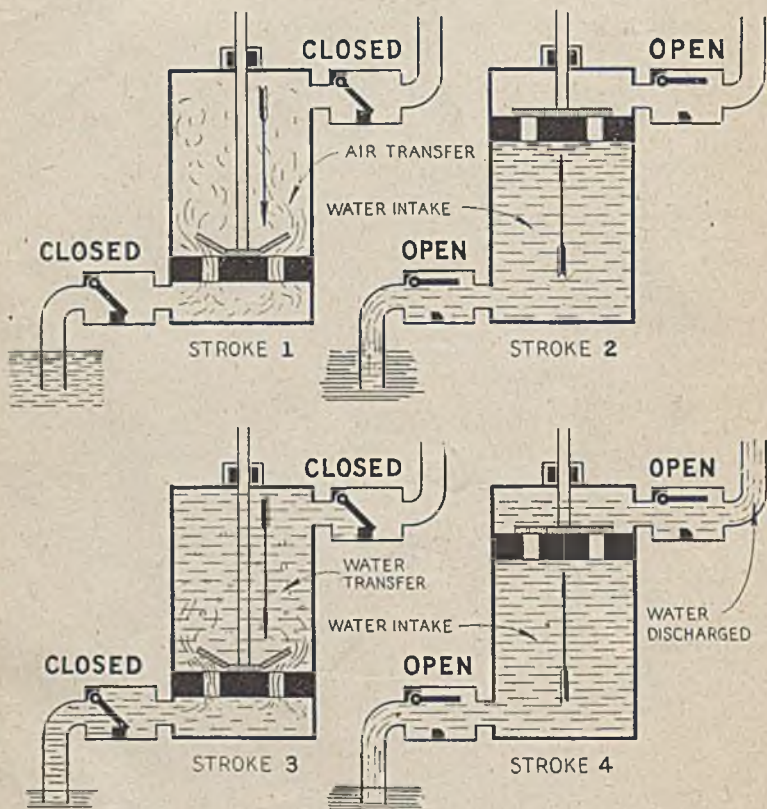
Class



1920

STARTING CYCLE

SINGLE ACTING BUCKET VALVE PUMP



Four stroke starting cycle single acting bucket valve force pump. **Stroke 1**, down, air transferred. **Stroke 2**, up, water transferred to cylinder below piston. **Stroke 3**, down, water transferred, above piston. **Stroke 4**, up, water discharged, end of cycle.

AUDELS
PUMPS
HYDRAULICS
AIR
COMPRESSORS

A PRACTICAL GUIDE
COVERING
THEORY, CONSTRUCTION AND OPERATION
OF
MODERN PUMPS, HYDRAULIC MACHINERY
AIR COMPRESSORS AND BLOWERS
FULLY ILLUSTRATED
FOR
ENGINEERS, MECHANICS AND OPERATORS
WITH QUESTIONS AND ANSWERS

BY
FRANK D. GRAHAM



THEO. AUDEL & CO., PUBLISHERS
49 WEST 23rd STREET - - NEW YORK

S. 74

2 59

5.80

621.65/69:621.61 (075.8)

S. 97



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AUTHOR'S NOTE

This volume is virtually three books in one, covering in great detail and exhaustively the subjects of

- 1. Pumps**
- 2. Hydraulics**
- 3. Compressors**

The purpose of this book is to supply needed information on the above subjects, especially as is indicated by the fact that pumps and compressors are universally used, being found in practically every plant. This has resulted in the development of a great number of types of these machines to meet the many different conditions of service.

The author introduces a large number of elementary or skeleton diagrams to explain basic principles, construction being shown by photographs of the latest designs as brought out by the leading manufacturers.

Considerable space is devoted to the practical side of installation, operation, maintenance and repair.

The author desires to express his appreciation to George W. Hood for *masterly* execution of line drawings from hundreds of the author's pencil sketches. To Evelyn K. Lawson, for efficient secretarial work, including assistance on make-up, proof reading, checking, etc. To Henry E. Raabe, M.E., for research consultations. To J. J. O'Riordan for efficient type setting, collating and make-up, and to William C. McCracken for efficient monotype composition.

To the Publishers for encouragement and suggestions during the preparation of the book.

Also to the following manufacturers for their co-operation in furnishing complete information covering their products:

ALDRICH PUMP	FOSTER	OIL GEAR
ALLIS-CHALMERS	FOSTER-WHEELER	ROOTS
AMERICAN MARSH	FREDERICK	ROTARY LIFT
BLACKMER	GARDNER DENVER	SCHUTTE & KOERTING
BOWSER	INGERSOLL-RAND	SIMMONDS
BUCYRUS	KRAISSL	SULLIVAN
BUFFALO	LAKE ERIE ENG.	TUTHILL
DAYTEN-DOWD	LEFFEL	TWIN DISC CLUTCH
DEAN BROS.	MACK	UNION
DE LAVAL	MANISTEE	WARREN
DEMING	MORRIS	WHEELER, C. H.
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FAIRBANKS-MORSE		

Considering this list, it must be evident that the best practice of construction has been adequately covered.

FRANK D. GRAHAM.

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How to Use This Index

To quickly and easily find information on any subject in this book the following instructions should be noted.

This book is divided into three sections indicated by the letters **A, B, C**, each covering a separate field as follows:

Section A. Pumps

“ **B. Hydraulics**

“ **C. Compressors**

The pages of each section are numbered independently and the index references are given with both the section letter and page number thus.

Single stage pumps.....A118

which means that the item will be found in the first or “A” section on page 118.

Get the Habit

Get the Habit of using this Index. It will quickly reveal a vast mine of valuable information.

*“An hour with a book would have brought to your mind,
The secret that took the whole year to find;
The facts that you learned at enormous expense,
Were all in this book to commence.”*

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