

# **HYDRAULIC MOTORS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649496310

Hydraulic Motors by F. A. Mahan & M. Bresse

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**F. A. MAHAN & M. BRESSE**

# **HYDRAULIC MOTORS**



# HYDRAULIC MOTORS.

TRANSLATED FROM THE

FRENCH COURS DE MÉCANIQUE APPLIQUÉE.

PAR

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NEW YORK:

JOHN WILEY & SON, 2 CLINTON HALL, ASTOR PLACE.

1889.

Entered according to Act of Congress, in the year 1869, by  
F. A. MAHAN,  
In the Clerk's Office of the District Court of the United States for the Southern District of  
New York.

THE NEW YORK PRINTING COMPANY,  
81, 83, and 85 Centre Street,  
NEW YORK.

## PREFACE.

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THE eminent position of M. Bresse in the scientific world, and in the French Corps of Civil Engineers, is my best apology for attempting to supply a want, felt by the students of civil engineering in our country, of some standard work on Hydraulic Motors, by furnishing a translation of the chapter on this subject contained in the second volume of M. Bresse's lectures on Applied Mechanics, delivered to the pupils of the School of Civil Engineers (*École des Ponts et Chaussées*) at Paris.

In making the translation, I have retained the French units of weights and measures in the numerical examples given, as the majority of our students are conversant with them.

F. A. MAHAN.

WILEY'S POINT, N. Y., July, 1869.





# CONTENTS.

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## § I.—PRELIMINARY IDEAS ON HYDRAULIC MOTORS.

	ART.	PAGE.
Definitions; theorem of the transmission of work in machines.....	1	9
Analogous ideas applied to a waterfall.....	2	11
General observations on the means of securing a good effective delivery for a waterfall driving a hydraulic motor.....	3	14

## § II.—WATER WHEELS WITH A HORIZONTAL AXLE.

Undershot wheel with plane buckets or floats moving in a confined race.....	4	17
Wheels arranged according to Poncelet's method.....	5	28
Paddle wheels in an unconfined current.....	6	34

### BREAST WHEELS.

Wheels set in a circular race, called breast wheels.....	7	36
Example of calculations for a rapidly moving breast wheel.....	8	48

### OVERSHOT WHEELS.

Wheels with buckets, or overshot wheels.....	9	51
----------------------------------------------	---	----

## § III.—WATER WHEELS WITH VERTICAL AXLES.

Old-fashioned spoon or tub wheels.....	10	66
----------------------------------------	----	----

### TURBINES.

Of turbines.....	11	69
Fourneyron's turbine.....	12	70
Fontaine's turbine.....	13	73
Kœcklin's turbine.....	14	76
Theory of the three preceding turbines.....	15	78
Remarks on the angles $\beta$ , $\gamma$ , $\theta$ , and on the dimensions $b$ , $b'$ , $r$ , $r'$ , $h$ , $h'$ .....	16	90

	ART.	PAGE.
Examples of the calculations to be made in constructing a turbine. . .	17	93
Of the means of regulating the expenditure of water in turbines. . .	18	98
Hydropneumatic turbine of Girard and Callon. . . . .	19	103
Some practical views on the subject of turbines. . . . .	20	105
Reaction wheels. . . . .	21	107

#### § IV.—OF A FEW MACHINES FOR RAISING WATER.

Pumps. . . . .	22	111
Spiral noria. . . . .	23	123
Lifting turbines; centrifugal pump. . . . .	24	127
Authorities on Water Wheels. . . . .		134

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#### APPENDIX.

Comparative table of French and United States measures. . . . .	135
Note A, Article 1. . . . .	135
Note B, Article 2. . . . .	136
Note C, Article 4. . . . .	137
Note D, Article 9. . . . .	140
Note E, Boyden turbines, from <i>Lowell Hydraulic Experiments</i> , by James B. Francis, Esq. . . . .	141

# HYDRAULIC MOTORS,

AND SOME

## MACHINES FOR RAISING WATER.

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### § 1.—PRELIMINARY IDEAS ON HYDRAULIC MOTORS.

1. *Definitions ; theorem of the transmission of work in machines.*—The term *machine* is applied to any body or collection of bodies intended to receive at some of their points certain forces, and to exert, at other points, forces which generally differ from the first in their intensity, direction, and the velocity of their points of application.

The *dynamic effect* of a machine is the total work, generally negative or resisting, which it receives from external bodies subject to its action. It happens that the dynamic effect is sometimes positive work: for example, when we let down a load by a rope passed over a pulley, the weight of the load produces a motive work on the system of the rope and pulley.

Let us suppose, to make this clear, that the dynamic effect is a resisting work. Independently of this, the machine is affected by some others which are employed to overcome friction, the resistance of the air, &c. The resistances which give rise to these negative works have received the name of *secondary*