

TS  
725  
C7

UC-NRLF



\$B 261 619

**USEFUL ALLOYS**  
**AND**  
**MEMORANDA**  
**FOR**  
**Goldsmiths, Jewellers, Etc.**  
—  
**COLLINS.**

YA 02155

LIBRARY

OF THE

UNIVERSITY OF CALIFORNIA.

Class C 712



MAY 29 1906

PRIVATE BOOK

FOR

GOLDSMITHS, JEWELLERS, ETC.



THE  
PRIVATE BOOK

OF

Useful Alloys and Memoranda

FOR

GOLDSMITHS, JEWELLERS, ETC.

By JAMES E. COLLINS,

CIVIL AND MECHANICAL ENGINEER.



NEW YORK :

D. VAN NOSTRAND, PUBLISHER,

23 MURRAY ST. AND 27 WARREN ST.

—  
1872.

TS7251  
C7

GENERAL

NEW YORK:  
JOHN ROSS & Co., PRINTERS,  
27 ROSE STREET.



# CONTENTS.



	PAGE
Standard Gold . . . . .	13
Assay Weight . . . . .	13
Table of different Qualities of Gold . . . . .	14
Carat of Gold . . . . .	15
Sterling Gold Alloy . . . . .	15
Dry-Colored Gold Alloys.	
17 Carat Gold . . . . .	15
18 Carat do. . . . .	16
Another do. . . . .	16
Another do. . . . .	16
Another do. . . . .	17
19 Carat Gold . . . . .	17
20 Carat do. . . . .	17
22 Carat do. . . . .	18
Dry-Colored Solder . . . . .	18
Alloy for Rings . . . . .	19
Solder for do. . . . .	19

Dry-Colored Gold Alloys.	
Dry-Colored Alloy . . . . .	19
Scrap reduced to 35s. Gold . . . . .	20
Dry-Coloring, Directions for . . . . .	20
Wet-Colored Gold Alloys.	
Alloys Nos. 1 and 2 . . . . .	22
Alloys Nos. 3 and 4 . . . . .	23
Green Gold Alloy, for Fancy Work . . . . .	23
Another do. . . . .	24
Another do. . . . .	24
Red Gold Alloy . . . . .	24
Another do. . . . .	25
Solder for do. . . . .	25
Another do. . . . .	25
Colored Flowers, Note on . . . . .	26
Wet-Colored Solder . . . . .	26
15 Carat Gold . . . . .	26
Alloys Nos. 5 and 6 . . . . .	27
Solder for do. . . . .	27
60s. Gold ; Good Color . . . . .	28
Wet Colored Solder . . . . .	28
22 Carat reduced to Wet-Colored . . . . .	28
Table of Alloy for Ordinary Wet-Colored Gold	29
Coins reduced to Wet-Colored : <i>with Scrap.</i>	
Alloys Nos. 1 and 2 . . . . .	30
Alloys Nos. 3, 4, and 5 . . . . .	31

	PAGE
Coins reduced to Wet-Colored : <i>without Scrap.</i>	
Alloy Nos. 1 and 2 . . . . .	32
Alloys Nos. 3, 4, and 5 . . . . .	33
Alloy No. 6 . . . . .	34
Melting and Refining, Note on . . . . .	34
To insure Gold Rolling well . . . . .	34
Wet-Coloring, Directions for . . . . .	35
Ditto by German Process . . . . .	37
To Collect Gold lost in Coloring . . . . .	39
Alloys of Gold for Enamelling.	
Pale Gold for Enamelling, etc. . . . .	42
Another do. . . . .	42
Another do. . . . .	42
Enamelling Gold No. 1 . . . . .	43
Ditto from Sterling . . . . .	43
Enamelling Gold Solder . . . . .	43
Another do, . . . . .	44
Enamelling Gold Nos. 2 and 3 . . . . .	44
Ditto Nos. 4 and 5. . . . .	45
Ditto, for Transparent Enamelling . . . . .	45
Gold Solder for Enamelling . . . . .	46
Pale Gold Alloys for Polishing, etc.	
Alloys Nos. 1 and 2 . . . . .	46
18 Carat, Pale . . . . .	47
Another do. . . . .	47
Pale Gold Solder . . . . .	47
Table of Alloy for Ordinary Bright Gold. . . . .	48

	PAGE
Composition for do. . . . .	48
Table of Alloy for Bright Gold Wire . . .	49
Alloys for Gold Pens.	
Alloy for Best Pens . . . . .	50
Solder for do. . . . .	50
Alloy for Medium Quality Pens . . . .	50
Composition for do. . . . .	51
Solder for do. . . . .	51
Alloy for Common Pens . . . . .	51
Solder for do. . . . .	52
Alloys of Gold with Brass.	
Alloys Nos. 1, 2, and 3 . . . . .	53
Directions for Melting do. . . . .	54
Alloy No. 4 . . . . .	54
Alloy No. 5 . . . . .	55
Composition for do. . . . .	55
Solder for do. . . . .	55
Miscellaneous Gold Alloys.	
45s. Gold . . . . .	56
Solder for do. . . . .	56
12 Carat Gold . . . . .	56
Another do. . . . .	57
Table of Alloys with Composition . . .	57
Composition for do. . . . .	58
Alloy for Gold Chains . . . . .	58
Another do. . . . .	58
35s. Gold for Pins . . . . .	59

*Contents.*

ix.

	PAGE
Miscellaneous Gold Alloys.	
35s. Gold from Dry-Colored Scrap . . . . .	59
Bright Gold Alloy . . . . .	59
Common Gold No. 1 . . . . .	60
Do.    No. 2 . . . . .	60
Medium Gold . . . . .	60
"California" . . . . .	61
Composition for do. . . . .	61
Common Gold, from do. . . . .	61
35s. Gold reduced to Common Gold . . . . .	62
29s. Gold . . . . .	62
To Clean Tarnished Work . . . . .	62
To Remove Soft Solder . . . . .	63
Silver Alloys.	
Sterling Silver . . . . .	63
Equal to do. . . . .	64
Another do. . . . .	64
Alloy for Plating . . . . .	64
Silver Solder . . . . .	65
Another do. . . . .	65
Silver Filigree Work . . . . .	65
Copper Solder, for Plating . . . . .	66
Common Silver, for Chains . . . . .	66
Solder for do. . . . .	66
4s. Silver Solder, for Enamelling . . . . .	67
Common Silver Solder . . . . .	67
Common Silver Solder for Filling . . . . .	67

	PAGE
Silver Alloys.	
Quick Silver-Solder . . . . .	68
Solder for Gold Plating . . . . .	68
Bismuth Solder . . . . .	68
Imitations.	
Imitation Silver . . . . .	69
Imitation Gold . . . . .	69

---



## P R E F A C E .



THIS little book is compiled from notes made by the Author from the papers of one of the largest and most eminent Manufacturing Goldsmiths and Jewellers in this country; and as this Firm is now no longer in existence, and the Author is at present engaged in some other undertaking, he now offers to the public the benefit of his experience, and, in so doing, he begs to state that all the Alloys, etc., given in these pages may be confidently relied on as being thoroughly practicable.

The Memoranda and Receipts throughout this book are also compiled from practice, and will, no doubt, be found equally useful to the practical Jeweller.

SHIRLEY, July, 1871.





## Private Book

FOR

# GOLDSMITHS, ETC.



### *Gold.*

STANDARD gold is compounded of 440 grains of fine gold, and 40 grains (Troy weight) to the oz. alloy; therefore, when you judge how much gold a piece of work will take, compound it to the standard weight by the following Table :

### *Assay Weight.*

The weight of gold is a pound, which is divided into 12 oz. ; each oz. into 24 carats ; each carat\* into 4 grains ; and, lastly, each grain into 4 quarters : then you see the Assay quarter-grain, in reality one grain and a quarter Troy.

\* The carat is an Abyssinian weight.

QUANTITY OF STANDARD GOLD TO COMPOUND AN OZ.  
OF ANY OF THE FOLLOWING ALLOYS, CALCULATED  
TO THE  $\frac{1}{4}$ th OF A GRAIN, IS AS FOLLOWS:—

Carat.	Dwts.	Grs.	Qrs.		Dwts.	Grs.	Qrs.
1	0	21	9	ALLOY TO BE ADDED.	19	2	2
2	1	19	7		18	4	4
3	2	17	5		17	6	6
4	3	15	3		16	8	8
5	4	13	1		15	10	10
6	5	10	10		14	13	1
7	6	8	8		13	15	3
8	7	6	6		12	17	5
9	8	4	4		11	19	7
10	9	2	2		10	21	9
11	10	0	0		10	0	0
12	10	21	9		9	2	2
13	11	19	7		8	4	4
14	12	17	5		7	6	6
15	13	15	3		6	8	8
16	14	13	1		5	10	10
17	15	10	10		4	13	1
18	16	8	8		3	15	3
19	17	6	6		2	17	5
20	18	4	4		1	19	7
21	19	2	2		0	21	9
22	20	0	0				

*Carat of Gold.*

	Dwts.	Grs.
Of a Pound . . . . .	10	0
Grain of do. . . . .	2	12
Quarter-grain of do. . . . .	0	15
<hr/>		
Of an Oz. . . . .	0	20
Grain of do. . . . .	0	5
Quarter-grain of do. . . . .	0	1 $\frac{1}{4}$

*Sterling Gold Alloy—77s. 10 $\frac{1}{2}$ d. per Oz.*

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	18	12
Fine Silver . . . . .	0	1	0
Swedish Copper . . . . .	0	0	12
	<hr/>		
	1	0	0
	<hr/> <hr/>		

*Dry-Colored Gold Alloys.***17 Carat.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	15	0
Fine Silver . . . . .	0	1	10
Swedish Copper . . . . .	0	4	17
	<hr/>		
	1	1	3
	<hr/> <hr/>		

*Dry-Colored Gold Alloys (continued).***18 Carat.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	10
Swedish Copper . . . . .	0	2	5
	<hr/>		
	1	6	15
	<hr/> <hr/>		

**Another 18 Carat.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	15	0
Fine Silver . . . . .	0	2	4
Swedish Copper . . . . .	0	2	19
	<hr/>		
	0	19	23
	<hr/> <hr/>		

**Another 18 Carat.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	18	0
Fine Silver . . . . .	0	2	18
Swedish Copper . . . . .	0	3	18
	<hr/>		
	1	4	12
	<hr/> <hr/>		

*Dry-Colored Gold Alloys (continued).*

## Another 18 Carat.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	1	6
Fine Silver . . . . .	0	3	10
Swedish Copper . . . . .	0	4	12
	<hr/>		
	1	9	4
	<hr/> <hr/>		

## 19 Carat.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	2	6
Swedish Copper . . . . .	0	3	12
	<hr/>		
	1	5	18
	<hr/> <hr/>		

## 20 Carat.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	2	0
Swedish Copper . . . . .	0	2	4
	<hr/>		
	1	4	4
	<hr/> <hr/>		

*Dry-Colored Gold Alloys (continued).***22 Carat.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	18	0
Fine Silver . . . . .	0	0	12
Swedish Copper . . . . .	0	1	3
	<hr/>		
	0	19	15
	<hr/> <hr/>		

In making Gold Solder for the foregoing alloys, take of the alloyed gold you are using—

	Oz.	Dwts.	Grs.
Gold Alloyed . . . . .	0	1	0
Fine Silver . . . . .	0	0	6
	<hr/>		
	0	1	6
	<hr/> <hr/>		

*or,*

	Oz.	Dwts.	Grs.
Gold Alloyed . . . . .	0	1	0
Fine Silver . . . . .	0	0	5
Swedish Copper . . . . .	0	0	1
	<hr/>		
	0	1	6
	<hr/> <hr/>		



*Dry-Colored Gold Alloys (continued).*

**Alloy for Dry-Colored Rings.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	6
Swedish Copper . . . . .	0	4	6
	<hr/>	<hr/>	<hr/>
	1	8	12
	<hr/>	<hr/>	<hr/>

**Solder for the Above.**

	Oz.	Dwts.	Grs.
Scrap Gold . . . . .	2	0	0
Fine Silver . . . . .	0	3	0
Swedish Copper . . . . .	0	3	0
	<hr/>	<hr/>	<hr/>
	2	6	0
	<hr/>	<hr/>	<hr/>

**Another Dry-Colored Alloy.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	5	0	0
Fine Silver . . . . .	1	0	0
Swedish Copper . . . . .	1	7	12
	<hr/>	<hr/>	<hr/>
	7	7	12
	<hr/>	<hr/>	<hr/>

*Dry-Colored Gold Alloys (continued).***Dry-Colored Scrap, reduced to 35s. Gold.**

	Oz.	Dwts.	Grs.
Colored Scrap . . . . .	1	9	12
Fine Silver . . . . .	0	2	0
Swedish Copper . . . . .	0	17	12
Spelter . . . . .	0	4	0
	<hr/>		
	2	13	0
	<hr/> <hr/>		

*Of Dry-Coloring the foregoing Alloys.*

This is done as follows:—Having your work well polished, take of Saltpetre, Alum, and Salt in proportion to the work to be colored; say, for 2 oz. of work, as under, viz. :

Saltpetre . . . . .	8 oz.
Alum . . . . .	4 oz.
Salt . . . . .	4 oz.

Procure also a black-lead pot, four or five inches high, or an iron pot cast from a black-lead pot—one or two sizes will be useful. To perform the process of Dry-Coloring, you must



have a thin iron bar to stir your "color" when dissolving. Your work cannot be too well polished; it is then cleaned with soda, soap, and hot water, and dried in box-sawdust. It must be afterwards covered with a thin layer of Borax; annealed and boiled out, and again dried in box-sawdust; and finally hung on platinum, or fine silver wire. When the "color" is in the pot, it is placed in the fire on a forge, and blown with bellows; it soon boils up. The heat cannot be too strong. When it assumes a brown-yellow flame, the work is dipped in for two or three seconds, and quenched in hot water diluted with Muriatic Acid, which removes any "color" that may adhere to the work. This ought to produce the color required; if it does not come, the same process must be followed again; but the work must be well dried before going into the "color," otherwise it will fly about, the burn or scald from which is very severe. Indeed, it is recommended to wear an old glove to save the hand. The color-pot must

be emptied immediately upon the forge, so that it may be ready if required again. In this process of coloring it is necessary to be very quick, whereas in wet-coloring it takes time. The waste "color" may be thrown into the sweep, as the gold lost is trifling.

*Wet-Colored Gold Alloys.*

**Alloy No. 1.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	3	12
Swedish Copper . . . . .	0	9	0
	<hr/>		
	1	12	12
	<hr/> <hr/>		

**Alloy No. 2.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	0
Swedish Copper . . . . .	0	9	12
	<hr/>		
	1	13	12
	<hr/> <hr/>		

*Wet-Colored Gold Alloys (continued).*

## Alloy No. 3.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	12
Swedish Copper . . . . .	0	10	0
	<hr/>		
	1	14	12
	<hr/> <hr/>		

## Alloy No. 4.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	12
Swedish Copper . . . . .	0	10	12
	<hr/>		
	1	15	0
	<hr/> <hr/>		

## Green Gold for Fancy Work.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	6	16
	<hr/>		
	1	6	16
	<hr/> <hr/>		

*Wet-Colored Gold Alloys (continued).***Another Green Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . .	0	10	0
Fine Silver . . . .	0	2	2
	<hr/>		
	0	12	2
	<hr/> <hr/>		

**Another Green Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . .	0	5	0
Fine Silver . . . .	0	1	12
	<hr/>		
	0	6	12
	<hr/> <hr/>		

**Red Gold for Fancy Work.**

	Oz.	Dwts.	Grs.
Fine Gold . . . .	0	5	0
Swedish Copper . . . .	0	2	12
	<hr/>		
	0	7	12
	<hr/> <hr/>		

*Wet-Colored Gold Alloys (continued).***Another Red Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	5	0
Swedish Copper . . . . .	0	1	6
	<hr/>		
	0	6	6
	<hr/> <hr/>		

To make Gold Solder for the foregoing alloys, take of the alloyed gold you are using—

	Oz.	Dwts.	Grs.
Gold Alloyed . . . . .	0	1	0
Fine Silver . . . . .	0	0	6
	<hr/>		
	0	1	6
	<hr/> <hr/>		

Or 5 grains of silver and 1 grain of copper may be used.

**Another Solder.**

	Oz.	Dwts.	Grs.
Gold Alloyed . . . . .	0	1	0
Fine Silver . . . . .	0	0	5
Pin-Brass . . . . .	0	0	1
	<hr/>		
	0	1	6
	<hr/> <hr/>		

NOTE.—This solder is good for repairing, and will not disturb the solder first mentioned. It will color well.

In fancy-work, platinum is used for grey or white flowers, as also fine silver, and fine gold for yellow flowers; but it remains with workmen to please themselves; if they desire to have good red or green gold, the fine gold must not be overpowered.

#### Wet-Colored Solder.

	Oz.	Dwts.	Grs.
Wet-Colored Scrap . . . . .	3	0	0
Fine Silver . . . . .	0	10	0
Swedish Copper . . . . .	0	5	0
	<u>3</u>	<u>15</u>	<u>0</u>

#### 15 Carat Gold.—Cost 56s. per Oz.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	18	0
Fine Silver . . . . .	0	12	12
Swedish Copper . . . . .	0	10	0
	<u>3</u>	<u>0</u>	<u>12</u>

*Wet-Colored Gold Alloys (continued).***Alloy No. 5.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	8	0
Swedish Copper . . . . .	0	4	0
	<hr/>		
	1	12	0
	<hr/> <hr/>		

**Alloy No. 6.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	6	0
Swedish Copper . . . . .	0	8	0
	<hr/>		
	1	14	0
	<hr/> <hr/>		

**Gold Solder for the Above.**

	Oz.	Dwts.	Grs.
Gold Scrap . . . . .	1	0	0
Fine Silver . . . . .	0	5	0
	<hr/>		
	1	5	0
	<hr/> <hr/>		

*Wet-Colored Gold Alloys (continued).***6os. Gold.—Good Color.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	6	0
Swedish Copper . . . . .	0	4	0
	<hr/>		
	1	10	0
	<hr/> <hr/>		

**Another Wet-Colored Solder.**

	Oz.	Dwts.	Grs.
Scrap Gold . . . . .	4	0	0
Fine Silver . . . . .	0	13	8
Swedish Copper . . . . .	0	6	16
	<hr/>		
	5	0	0
	<hr/> <hr/>		

**To Reduce 22 Carat into Wet-Colored Gold.**

	Oz.	Dwts.	Grs.
Gold Coins . . . . .	4	8	0
Fine Silver . . . . .	0	13	0
Swedish Copper . . . . .	1	13	0
	<hr/>		
	6	14	0
	<hr/> <hr/>		



*Ordinary Wet-Colored Gold.*

TABLE SHOWING THE PROPORTIONS OF ALLOY WITH FROM ONE OZ. UP TO  
TEN OZ. OF FINE GOLD.

Fine Gold.			Fine Silver.			Swedish Copper.			Total.		
Oz.	Dwts.	Grs.	Oz.	Dwts.	Grs.	Oz.	Dwts.	Grs.	Oz.	Dwts.	Grs.
1	0	0	0	4	12	0	10	12	1	15	0
2	0	0	0	9	0	1	1	0	3	10	0
3	0	0	0	13	12	1	11	12	5	5	0
4	0	0	0	18	0	2	2	0	7	0	0
5	0	0	1	2	12	2	12	12	8	15	0
6	0	0	1	7	0	3	3	0	10	10	0
7	0	0	1	11	12	3	13	12	12	5	0
8	0	0	1	16	0	4	4	0	14	0	0
9	0	0	2	0	12	4	14	12	15	15	0
10	0	0	2	5	0	5	5	0	17	10	0

*Different Methods of reducing 22 Carat to  
Ordinary Wet-Colored Gold.*

**With Scrap.**

**No. 1.**

	Oz.	Dwts.	Grs.
Coins . . . . .	1	0	0
Fine Gold . . . . .	3	0	0
Fine Silver . . . . .	0	17	12
Swedish Copper . . . . .	2	1	12
Scrap . . . . .	3	1	0
	<hr/>	<hr/>	<hr/>
	10	0	0
	<hr/>	<hr/>	<hr/>

**No. 2.**

	Oz.	Dwts.	Grs.
Coins . . . . .	1	0	0
Fine Gold . . . . .	4	0	0
Fine Silver . . . . .	1	2	0
Swedish Copper . . . . .	2	12	0
Scrap . . . . .	1	6	0
	<hr/>	<hr/>	<hr/>
	10	0	0
	<hr/>	<hr/>	<hr/>

## No. 3.

	Oz.	Dwts.	Grs.
Coins . . . . .	2	0	0
Fine Gold . . . . .	3	3	8
Fine Silver . . . . .	1	1	4
Swedish Copper . . . . .	2	10	12
Scrap . . . . .	1	5	0
	<hr/>		
	10	0	0
	<hr/> <hr/>		

## No. 4.

	Oz.	Dwts.	Grs.
Coins . . . . .	3	1	6
Fine Gold . . . . .	2	0	0
Fine Silver . . . . .	1	1	0
Swedish Copper . . . . .	2	11	0
Scrap . . . . .	1	6	18
	<hr/>		
	10	0	0
	<hr/> <hr/>		

## No. 5.

	Oz.	Dwts.	Grs.
Coins . . . . .	1	0	0
Fine Gold . . . . .	4	0	0
Fine Silver . . . . .	1	1	12
Swedish Copper . . . . .	2	11	12
Scrap . . . . .	6	7	0
	<hr/>		
	15	0	0
	<hr/> <hr/>		

*Different Methods of reducing 22 Carat to  
Ordinary Wet-Colored Gold.*

**Without Scrap.**

**No. 1.**

	Oz.	Dwts.	Grs.
Coins . . . . .	1	0	0
Fine Gold . . . . .	8	0	0
Fine Silver . . . . .	2	0	0
Swedish Copper . . . . .	4	14	0
	<hr/>	<hr/>	<hr/>
	15	14	0
	<hr/>	<hr/>	<hr/>

**No. 2.**

	Oz.	Dwts.	Grs.
Coins . . . . .	1	0	0
Fine Gold . . . . .	2	0	0
Fine Silver . . . . .	0	13	0
Swedish Copper . . . . .	1	11	0
	<hr/>	<hr/>	<hr/>
	5	4	0
	<hr/>	<hr/>	<hr/>

## No. 3.

	Oz.	Dwts.	Grs.
Coins . . . . .	2	0	0
Fine Gold . . . . .	5	0	0
Fine Silver . . . . .	1	9	12
Swedish Copper . . . . .	3	11	12
	<u>12</u>	<u>1</u>	<u>0</u>

## No. 4.

	Oz.	Dwts.	Grs.
Coins . . . . .	2	0	0
Fine Gold . . . . .	6	0	0
Fine Silver . . . . .	1	14	0
Swedish Copper . . . . .	4	2	0
	<u>13</u>	<u>16</u>	<u>0</u>

## No. 5.

	Oz.	Dwts.	Grs.
Coins . . . . .	2	0	0
Fine Gold . . . . .	8	0	0
Fine Silver . . . . .	2	3	0
Swedish Copper . . . . .	5	3	0
	<u>17</u>	<u>6</u>	<u>0</u>

## No. 6.

	Oz.	Dwts.	Grs.
Coins . . . . .	4	0	0
Fine Gold : . . . . .	6	0	0
Fine Silver . . . . .	2	2	0
Swedish Copper . . . . .	5	2	0
	<hr/>		
	17	4	0
	<hr/> <hr/>		

*Melting and Refining.*

In melting gold it will sometimes happen that steel or iron filings get into the gold; this may be removed by throwing in a piece of Sandiver about the size of a common nut. It will draw the iron or steel into the flux, and leave the gold; or Sublimate of Mercury will destroy the iron or steel.

*To insure Gold Rolling well.*

Melt until a good heat; then take a teaspoonful of half Sal Ammoniac and half pow-

dered Charcoal. Stir it up well; then put on the cover for one minute, and pour.

---

*Of Wet-Coloring the foregoing Alloys.*

This is performed in the following manner: Having annealed your work, and boiled it out so as to get it perfectly clean, take of Saltpetre 15 oz., of Alum 7 oz., and of Salt 7 oz.; pound them all fine, and mix well together; then provide a blacklead pot about 12 inches high, put your ingredients into it, and dissolve gradually. It must be on no account hurried, for, if it burns, the "color" will be spoiled. As the heat increases it will boil up; then add 2 oz. of Muriatic Acid, when the "color" will sink in the pot. Take a wooden spoon and stir it well, when it will again boil up. Take your work, which you have made clean, and tied in small parcels with platinum or fine silver wire, and immerse it in the "color" for four

minutes, keeping it on the move, so that the "color" may act upon all parts alike. At the end of that time take it out and rinse it well in boiling water, which you have ready in a kettle, with pint or quart basins, according to the quantity or size of your work. Next, place your work in the "color" for one minute and a half; take it out and rinse well in fresh hot water. Two fluid oz. of hot water must then be added, when the "color" will sink in the pot, but will rise again; put in your work for one minute, again rinsing it in fresh hot water, when you will find it begin to brighten. Lastly, put your work in the "color" for half a minute longer, rinsing it for the last time in clean hot water, after which you will find it a beautiful color. This process, by a little attention, never fails.

NOTE.—The mixture of "coloring" should be according to the weight of work. If a small quantity, say 2 oz., the proportions should be—



Saltpetre	.	.	.	.	8 oz.
Alum	.	.	.	.	4 oz.
Common Salt	.	.	.	.	4 oz.
Muriatic Acid	.	.	.	.	1 oz.

If 5 oz. of work, double the quantities, and so in proportion to the weight; but practice will make perfect.

---

#### *Of Wet-Coloring by the German Process.*

Tie up your work in small bunches with fine silver or platinum wire; then, for 3 oz. of work, take a blacklead pot, 6 or 7 inches high, and, having previously placed your work in hot water, put it on the fire; when thoroughly dry, put into it of Saltpetre 6 oz., and of Common Salt 3 oz.; stir them well with a wooden spoon, and when thoroughly dried fine and hot, put into it 5 fluid oz. of Muriatic Acid. When boiling up, put in your bunch of work, having previously shaken the water from it, and keep it on the move for three minutes, care being

taken to keep it well covered all this time. At the end of this time, take it out and plunge it into a vessel of clean hot water, and finally into a second vessel of the same. Add then to your "color" in the pot 6 fluid oz. of hot water, and when it boils up again, after being thus diluted, put in your work for one minute longer, and again rinse it as before directed, when it will be found to be a beautiful color.

Too much clean hot water cannot be used for plunging the work in each time through the "color." If the work is hollow-work and bulky, not quite so much as 3 oz. should be put, as it is not so effectually covered in the pot.

In Wet-Coloring it sometimes happens that the color is rather dead; or it may happen that the "color" burns, which causes the work to look brown: this is a precipitation which may be removed by scratching at the lathe with stale beer or ale, with a fine brass wire brush, similar to the round hair-brushes used for polishing.

In Coloring, a large stone jar should be pro-

vided, into which should be emptied your "color" when done with, for the pot should be washed out each time, so as to be ready when required again. Into this stone jar should also be emptied the water in which you rinse your work, as it all contains gold to a great extent.

All things connected with the process should be kept clean and free from grease of any kind.

No iron ought to be near this Wet-Color in the pot, as it is most injurious.

---

*To Collect the Gold lost in Coloring.*

Where there is a large amount of work made and colored, the loss is estimated at 1 dwt. or more per oz.; this in time becomes a serious matter. To collect that loss the following method is used. Take one of the basins you use, and put into it a handful of Sulphate of Iron, and pour boiling water upon it to dissolve it. When dissolved, pour it into your stone jar in which you keep your "color"-water; this pre-

cipitates the small particles of gold, and must be done each time you color. It should be collected every six months, if the amount of work colored be much, in the following manner :


With a syphon draw off the water from your jar, but in doing so be careful not to disturb the sediment which is at the bottom, for it contains the gold. After you have got off what water you can, it must be washed with three or four kettlefuls of boiling water, each kettleful being done separately, and allowed to cool each time and the water carefully got off: this is to clear the sediment of any acid. It is known to be sufficiently done by touching the water with the finger and tasting it.

When freed from acid, put it into an iron pan and dry gradually by the fire. When dried, put it into an iron ladle and make it red hot, stirring it carefully with a tobacco-pipe, care being taken not to spill it. It will turn red in annealing.

Having proceeded thus far, take of the sedi-

ment thus prepared 1 oz., of Borax pounded fine 15 dwts., of common bottle-glass pounded fine 5 dwts., and of Pearlash pounded fine 4 dwts.; mix all well together. Put this into a skittle-pot, which should have a cover, and in placing it in the furnace there should be a small pot reversed for the skittle-pot to stand on. You then lay your fire, which must be lighted at the top, so that the light particles of gold may be carried downwards. After the fire is at its height it is continued for forty minutes, then allowed to burn out, when the metal will be found at the bottom of the pot. This you refine with Saltpetre.

Even if jewellers did not wish to collect for themselves, they would find the benefit of taking care of this sediment, and selling it to the refiners.

 Too much care cannot be taken in procuring pure Spirits of Salts, or Muriatic Acid.



*Alloys of Gold for Enamelling.***Pale Gold for Coloring, Enamelling, or Lapping.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	9	0
Swedish Copper . . . . .	0	2	12
	<hr/>		
	1	11	12
	<hr/> <hr/>		

**Another Ditto.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	9	0
Swedish Copper . . . . .	0	3	12
	<hr/>		
	1	12	12
	<hr/> <hr/>		

**Another Ditto.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	10	0
Swedish Copper . . . . .	0	3	12
	<hr/>		
	1	13	12
	<hr/> <hr/>		

*Alloys of Gold for Enamelling (continued).***Enamelling Gold No. 1.**

	Oz.	Dwts.	Grs.
Fine Gold . . . .	1	0	0
Fine Silver . . . .	0	1	12
Swedish Copper . . . .	0	2	12
	<u>1</u>	<u>4</u>	<u>0</u>

**Enamelling Gold from Sterling.**

	Oz.	Dwts.	Grs.
Sterling Gold . . . .	1	0	0
Fine Silver . . . .	0	0	18
Swedish Copper . . . .	0	2	0
	<u>1</u>	<u>2</u>	<u>18</u>

**Enamelling Gold Solder.**

	Oz.	Dwts.	Grs.
Gold Alloyed . . . .	0	1	0
Fine Silver . . . .	0	0	4
	<u>0</u>	<u>1</u>	<u>4</u>

*Alloys of Gold for Enamelling (continued).*

Another Ditto, 43s. per Oz.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	12	0
Fine Silver . . . . .	0	7	3
Swedish Copper . . . . .	0	6	0
	<hr/>		
	1	5	3
	<hr/> <hr/>		

Enamelling Gold No. 2—Cost 50s. per Oz.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	9	12
Swedish Copper . . . . .	0	7	12
	<hr/>		
	1	17	0
	<hr/> <hr/>		

Enamelling Gold No. 3.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	14	0
Swedish Copper . . . . .	0	8	0
	<hr/>		
	2	2	0
	<hr/> <hr/>		



*Alloys of Gold for Enamelling (continued).***Enamelling Gold No. 4.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	2	5	0
Fine Silver . . . . .	1	6	0
Swedish Copper . . . . .	1	0	0
Pin-Brass . . . . .	0	5	0
	<hr/>		
	4	16	0
	<hr/> <hr/>		

**Enamelling Gold No. 5.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	12	0
Swedish Copper . . . . .	0	6	0
	<hr/>		
	1	18	0
	<hr/> <hr/>		

**Enamelling Gold No. 6.—For Transparent Enamelling.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	14	0
Swedish Copper . . . . .	0	6	0
	<hr/>		
	2	0	0
	<hr/> <hr/>		

*Alloys of Gold for Enamelling (continued).***Gold Solder for Enamelled Work.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	1	0	0
Swedish Copper . . . . .	0	10	0
Silver Solder . . . . .	0	8	8
	<hr/>		
	2	18	8
	<hr/> <hr/>		

*Pale Gold Alloys for Polishing, Etc.***No. 1.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	8	0
Swedish Copper . . . . .	0	3	12
	<hr/>		
	1	11	12
	<hr/> <hr/>		

**No. 2.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	1	20
Swedish Copper . . . . .	0	1	4
	<hr/>		
	1	3	0
	<hr/> <hr/>		

*Pale Gold Alloys (continued).*

## 18 Carat, Pale.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	0
Swedish Copper . . . . .	0	2	15
	<u>1</u>	<u>6</u>	<u>15</u>

## Another 18 Carat.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	12
Fine Silver . . . . .	0	3	8
Swedish Copper . . . . .	0	3	8
	<u>1</u>	<u>7</u>	<u>4</u>

## Pale Gold Solder.

	Oz.	Dwts.	Grs.
Gold Alloyed . . . . .	0	1	6
Fine Silver . . . . .	0	1	0
	<u>0</u>	<u>2</u>	<u>6</u>

*Ordinary Bright Gold.*TABLE SHOWING THE PROPORTION OF ALLOY WITH  
FROM 1 OZ. UP TO 6 OZ. OF FINE GOLD.

FINE GOLD.			FINE SILVER.			COMPOSITION.			TOTAL.		
Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
1	0	0	0	5	0	1	8	0	2	13	0
2	0	0	0	10	0	2	16	0	5	6	0
3	0	0	0	15	0	4	4	0	7	19	0
4	0	0	1	0	0	5	12	0	10	12	0
5	0	0	1	5	0	7	0	0	13	5	0
6	0	0	1	10	0	8	8	0	15	18	0

## Composition for the Above.

	Oz.	Dwts.	Grs.
Fine Copper . . . . .	44	0	0
Spelter . . . . .	8	0	0
	<hr/>	<hr/>	<hr/>
	52	0	0
	<hr/>	<hr/>	<hr/>

*Ordinary Bright Gold Wire.*

TABLE SHOWING THE PROPORTIONS OF ALLOY FROM 1 Oz.  
UP TO 21 Oz.

FINE GOLD.		FINE SILVER.		SWEDISH COPPER.		TOTAL.	
Oz.	Dwts. Grs.	Oz.	Dwts. Grs.	Oz.	Dwts. Grs.	Oz.	Dwts. Grs.
0	5 21	0	7 6	0	6 21	1	0 0
0	11 18	0	14 12	0	13 18	2	0 0
0	17 15	1	1 18	1	0 15	3	0 0
1	15 6	2	3 12	2	1 6	6	0 0
2	12 21	3	5 6	3	1 21	9	0 0
3	10 12	4	7 0	4	2 12	12	0 0
4	8 3	5	8 18	5	3 3	15	0 0
5	5 18	6	10 12	6	3 18	18	0 0
6	3 9	7	12 6	7	4 9	21	0 0

*Alloys for Gold Pens.***Alloy for Best Pens.—52s.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	5	0
Swedish Copper . . . . .	0	7	18
Spelter . . . . .	0	1	6
	<hr/>		
	1	14	0
	<hr/> <hr/>		

**Solder for the Above.—43s.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	12	0
Fine Silver . . . . .	0	7	3
Swedish Copper . . . . .	0	6	0
	<hr/>		
	1	5	3
	<hr/> <hr/>		

**Medium Quality Pens.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Composition . . . . .	1	13	0
	<hr/>		
	2	13	0
	<hr/> <hr/>		

*Alloys for Gold Pens (continued).***Composition for the Above.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	17	0
Swedish Copper . . . . .	5	15	0
Spelter . . . . .	0	18	20
	<hr/>		
	8	10	20
	<hr/> <hr/>		

**Solder for the Foregoing.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	1	0	0
Pin Brass . . . . .	1	0	0
	<hr/>		
	3	0	0
	<hr/> <hr/>		

**Gold for Common Pens.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	2	0	0
Swedish Copper . . . . .	1	0	0
	<hr/>		
	4	0	0
	<hr/> <hr/>		

*Alloys for Gold Pens (continued).***Solder for the Foregoing.**

	Oz	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	2	0	0
Pin-Brass . . . . .	1	0	0
	<hr/>		
	4	0	0
	<hr/> <hr/>		



*Alloys of Gold with Brass.*

## Alloy No. 1.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	5	6
Swedish Copper . . . . .	0	3	12
Pin-Brass . . . . .	0	18	0
	<hr/>		
	2	6	18
	<hr/> <hr/>		


## Alloy No. 2.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	4	0
Swedish Copper . . . . .	0	4	0
Pin-Brass . . . . .	0	16	0
	<hr/>		
	2	4	0
	<hr/> <hr/>		

## Alloy No. 3.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	5	12
Swedish Copper . . . . .	0	3	12
Pin-Brass . . . . .	0	19	6
	<hr/>		
	2	8	6
	<hr/> <hr/>		

*Alloys of Gold with Brass (continued).*

 in melting the Brass-Gold it often happens the gold, to the naked eye, seems all right, yet, when it comes to be flattened at the mill, it is full of air and not fit for use; this may be avoided by having a tobacco-pipe to stir the metal when in fusion. The nature of the alloys, and the quantity of Borax used as flux, are the cause; but acting on the advice given, and by applying sufficient heat, this may be avoided.

**Alloy No. 4.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	3	21
Swedish Copper . . . . .	0	9	3
Composition . . . . .	0	5	6
	<hr/>		
	1	18	6
	<hr/> <hr/>		

*Alloys of Gold with Brass (continued).*

## Alloy No. 5.

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	15	9
Fine Silver . . . . .	0	5	19
Swedish Copper . . . . .	0	3	21
Composition . . . . .	0	15	0
	<hr/>		
	2	0	1
	<hr/> <hr/>		

## Composition for the Above.

	Oz.	Dwts.	Grs.
Swedish Copper . . . . .	1	0	0
Spelter . . . . .	0	5	0
	<hr/>		
	1	5	0
	<hr/> <hr/>		

In making solder for the foregoing alloys, take of the alloyed gold you are using—

	Oz.	Dwts.	Grs.
Gold Alloyed . . . . .	0	1	0
Fine Silver . . . . .	0	0	12
	<hr/>		
	0	1	12
	<hr/> <hr/>		

*Miscellaneous Gold Alloys.***45s. Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Composition* . . . . .	1	0	0
	<hr/>		
	2	0	0
	<hr/> <hr/>		

**Solder for the Above.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	15	0
Swedish Copper . . . . .	0	15	0
	<hr/>		
	2	10	0
	<hr/> <hr/>		

**12 Carat Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	10	0
Swedish Copper . . . . .	0	9	6
	<hr/>		
	1	19	6
	<hr/> <hr/>		

\* For Composition for the above, see page 51.

*Miscellaneous Gold Alloys (continued).***Another 12 Carat.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	12
Fine Silver . . . . .	0	6	12
Swedish Copper . . . . .	0	11	12
Spelter . . . . .	0	1	12
	<hr/>	<hr/>	<hr/>
	2	0	0
	<hr/>	<hr/>	<hr/>

**Table of Alloys.****FOR DIFFERENT QUALITIES OF GOLD.**

QUALITY.	FINE GOLD.			COMPOSITION.			TOTAL.		
	Oz	Dwt	Grs.	Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
9 Carat	0	7	12	0	12	12	1	0	0
12 "	0	10	0	0	10	0	1	0	0
15 "	0	12	12	0	7	12	1	0	0
18 "	0	15	0	0	5	0	1	0	0
22 "	0	18	18	0	1	6	1	0	0

*Miscellaneous Gold Alloys (continued).***Composition for the Above.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	3	5	12
Swedish Copper . . . . .	8	12	12
Spelter . . . . .	1	18	6
	<hr/>		
	13	16	6
	<hr/> <hr/>		

**Alloy for Gold Chains.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	11	6
Fine Silver . . . . .	0	2	5
Swedish Copper . . . . .	0	6	13
	<hr/>		
	1	0	0
	<hr/> <hr/>		

**Another Ditto.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	9	0
Swedish Copper . . . . .	0	8	0
	<hr/>		
	1	17	0
	<hr/> <hr/>		

*Miscellaneous Gold Alloys (continued).***35s. Gold for Pins.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	5	0
Swedish Copper . . . . .	1	0	0
Spelter . . . . .	0	5	0
	<hr/>		
	2	10	0
	<hr/> <hr/>		

**Dry-Colored Scrap reduced to 35s. Gold.**

	Oz.	Dwts.	Grs.
Colored Scrap . . . . .	1	9	12
Fine Silver . . . . .	0	2	0
Swedish Copper . . . . .	0	17	12
Spelter . . . . .	0	4	0
	<hr/>		
	2	13	0
	<hr/> <hr/>		

**Bright Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	7	0
Composition * . . . . .	1	6	0
	<hr/>		
	2	13	0
	<hr/> <hr/>		

\* For Composition for the above, see page 48.

*Miscellaneous Gold Alloys (continued).***Common Gold No. 1.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	8	0
Composition* . . . . .	1	12	0
	<hr/>		
	3	0	0
	<hr/> <hr/>		

**Common Gold No. 2.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	0	5	0
Fine Silver . . . . .	0	3	6
Swedish Copper . . . . .	0	6	12
	<hr/>		
	0	14	18
	<hr/> <hr/>		

**Medium Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	0	0
Fine Silver . . . . .	0	12	0
Swedish Copper . . . . .	0	13	0
	<hr/>		
	2	5	0
	<hr/> <hr/>		

\* For Composition for the above, see page 48.



*Miscellaneous Gold Alloys (continued).*

## "California."

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	11	0	0
Composition . . . . .	15	10	0
	<hr/>		
	26	10	0
	<hr/>		
	<hr/>		

## Composition for "California."

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	15	12	0
Swedish Copper . . . . .	67	0	0
Spelter . . . . .	11	0	0
	<hr/>		
	93	12	0
	<hr/>		
	<hr/>		

## Common Gold, from "California."

	Oz.	Dwts.	Grs.
"California" . . . . .	8	0	0
Fine Silver . . . . .	13	16	0
Swedish Copper . . . . .	6	16	0
	<hr/>		
	28	2	0
	<hr/>		
	<hr/>		

*Miscellaneous Gold Alloys (continued).***To reduce 35s. Scrap to Common Gold.**

	Oz.	Dwts.	Grs.
Scrap . . . . .	9	18	0
Composition * . . . . .	2	2	0
	<hr/>		
	12	0	0
	<hr/> <hr/>		

**29s. Gold.**

	Oz.	Dwts.	Grs.
Fine Gold . . . . .	1	13	6
Fine Silver . . . . .	1	12	12
Swedish Copper . . . . .	1	16	6
Spelter . . . . .	0	4	0
	<hr/>		
	5	6	0
	<hr/> <hr/>		

Will stand the Aquafortis very well.

*To Clean Old Work that is Tarnished.*

This is done by heating the articles gently with a blow-pipe, and boiling out in rather strong pickle of Muriatic Acid; it may be re-

\* For Composition for the above, see page 58.

moved by boiling in Chloride of Lime and water in a pipkin, and touching the work at a lathe with a scratch-brush.

*To Remove Soft-Solder from Work to be Mended or Colored.*

Remove what you can by the scraper, or otherwise gently heating it, so that you may shake all off that you can. Place it in Spirits of Salts for some time. This receipt is useful where hard-soldering is required, whether in colored or bright work.

*Silver Alloys.*

**Sterling Silver.**

	Oz.	Dwts.	Grs.
Fine Silver . . . .	11	2	0
Swedish Copper . . . .	0	18	0
	<hr/>		
	12	0	0
	<hr/>		

*Silver Alloys (continued).*

## Equal to Sterling.

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Swedish Copper . . . . .	0	1	12
	<hr/>		
	1	1	12
	<hr/> <hr/>		

## Another Ditto.

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Swedish Copper . . . . .	0	5	0
	<hr/>		
	1	5	0
	<hr/> <hr/>		

## Alloy for Plating.

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Swedish Copper . . . . .	0	10	0
	<hr/>		
	1	10	0
	<hr/> <hr/>		

*Silver Alloys (continued).***Silver Solder.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Pin Brass . . . . .	0	10	0
	<hr/>		
	1	10	0
	<hr/> <hr/>		

**Another Ditto.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Pin-Brass . . . . .	0	10	0
Pure Spelter . . . . .	0	2	0
	<hr/>		
	1	12	0
	<hr/> <hr/>		

In fine silver filigree-work, fine silver is always used for the filigree. The Framework is generally made of sterling silver. The solder for such work is as follows :

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	0	4	6
Pin-Brass . . . . .	0	1	0
	<hr/>		
	0	5	6
	<hr/> <hr/>		

*Silver Alloys (continued).***Copper Solder, for Plating.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	0	10	0
Swedish Copper . . . . .	0	10	0
	<hr/>		
	1	0	0
	<hr/> <hr/>		

This is a useful solder for plating or soldering silver work; it never eats as does silver solder.

**Common Silver, for Chains.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	6	0	0
Swedish Copper . . . . .	4	0	0
	<hr/>		
	10	0	0
	<hr/> <hr/>		

**Solder for the above.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	0	16	0
Swedish Copper . . . . .	0	0	12
Pin-Brass . . . . .	0	3	12
	<hr/>		
	1	0	0
	<hr/> <hr/>		

*Silver Alloys (continued).***Silver Solder, for Enamelling, 4s. per Oz.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	0	14	0
Swedish Copper . . . . .	0	8	0
	<hr/>		
	1	2	0
	<hr/> <hr/>		

**Common Silver Solder.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	20	0	0
Pin-Brass . . . . .	13	0	0
Spelter . . . . .	1	0	0
	<hr/>		
	34	0	0
	<hr/> <hr/>		

**Ditto, for filling Signet Rings.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	20	0	0
Swedish Copper . . . . .	3	8	0
Pin-Brass . . . . .	13	0	0
Spelter . . . . .	1	0	0
	<hr/>		
	37	8	0
	<hr/> <hr/>		

*Silver Alloys (continued).***Quick Silver-Solder.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Pin-Brass . . . . .	0	10	0
Bar Tin . . . . .	0	2	0
	<hr/>		
	1	12	0
	<hr/> <hr/>		

**Silver Solder, for Gold Plating.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Swedish Copper . . . . .	0	5	0
Pin Brass . . . . .	0	5	0
	<hr/>		
	1	10	0
	<hr/> <hr/>		

**Bismuth Solder.**

	Oz.	Dwts.	Grs.
Bismuth . . . . .	12	0	0
Lead . . . . .	15	0	0
Tin . . . . .	21	0	0
	<hr/>		
	48	0	0
	<hr/> <hr/>		



*Imitations.***Imitation Silver.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	1	0	0
Nickel . . . . .	1	11	0
Swedish Copper . . . . .	2	9	0
	<hr/>		
	5	0	0
	<hr/> <hr/>		

*or,*

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	3	0	0
Nickel . . . . .	1	11	0
Swedish Copper . . . . .	2	9	0
Spelter . . . . .	0	10	0
	<hr/>		
	7	10	0
	<hr/> <hr/>		

**Imitation Gold.**

	Oz.	Dwts.	Grs.
Fine Silver . . . . .	2	5	0
Swedish Copper . . . . .	1	0	0
Composition* . . . . .	1	0	0
	<hr/>		
	4	5	0
	<hr/> <hr/>		

The above costs 3s. 6d. per oz., and will keep its color very well.

\* For Composition see page 48



V. A. BARNES WORKS

100 N. 3rd St. St. Louis, Mo.

FOR SALE

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

100 N. 3rd St. St. Louis, Mo.

VALUABLE WORKS

FOR

CLOCK,

Watch Makers and Jewellers.

---

A Rudimentary Treatise on Clocks  
and Watches, and Bells.

With a full account of the Westminster  
Clock and Bells. New edition, rewritten  
and enlarged, with an appendix. By E. B.  
DENISON, M. A. 12mo, flex. cloth..... \$1 40

Watch Repairer's Hand Book.

By F. KEMLO. 12mo, cloth..... \$1 25

A Treatise on Clock and Watchmak-  
ing--Theoretical and Practical.

By THOMAS REID. 8vo, cloth (scarce).

Diamonds and Precious Stones.  
Their Value, History, and Distinguishing  
Characteristics; with simple tests for their  
identification. By HARRY EMANUEL, F.R.G.S.  
Second edition, with a new table of the  
present value of diamonds. 8vo, cloth,  
illustrated..... \$3 00

The Natural History, Ancient and  
Modern, of Precious Stones and  
Gems, and of the Precious Metals.  
By C. W. KING, M. A. The original edition,  
large 8vo, printed on fine paper and bound  
in white cloth.....\$10 50

---

\* \* Any of the above sent by mail, post-paid, upon  
receipt of price.

---

D. VAN NOSTRAND,

PUBLISHER AND IMPORTER,

23 MURRAY & 27 WARREN STREETS,

New York.

# CATALOGUE

OF THE

# SCIENTIFIC PUBLICATIONS

OF

## D. VAN NOSTRAND COMPANY,

23 MURRAY STREET AND 27 WARREN STREET, N. Y.

---

**A. B. C. CODE.** (See Clausen-Thue.)

**ABBOTT (A. V.).** The Electrical Transmission of Energy. A Manual for the Design of Electrical Circuits. Second edition, revised. Fully illustrated. 8vo, cloth..... \$4 50

**ABBOT (Gen'l HENRY L.).** The Defence of the Seacoast of the United States. Lectures delivered before the U. S. Naval War College. 8vo, red cloth. 2 00

**ADAMS (J. W.).** Sewers and Drains for Populous Districts. Embracing Rules and Formulas for the dimensions and construction of works of Sanitary Engineers. Fifth edition. 8vo, cloth. .... 2 50

**A1. CODE.** (See Clausen-Thue.)

**AIKMAN (C. M., Prof.).** Manures and the Principles of Manuring. 8vo, cloth..... 2 50

**ALEXANDER (J. H.).** Universal Dictionary of Weights and Measures, Ancient and Modern, reduced to the Standards of the United States of America. New edition, enlarged. 8vo, cloth..... 3 50

**ALEXANDER (S. A.).** Broke Down: What Should I Do? A Ready Reference and Key to Locomotive Engineers and Firemen, Round House Machinists, Conductors, Train Hands and Inspectors. With 5 folding plates. 12mo, cloth..... 1 50

**ALLEN (C. F.).** Tables for Earthwork Computation. 8vo, cloth .. 1 50

- 
- ANDERSON (J. W.).** The Prospector's Hand-book ; A Guide for the Prospector and Traveller in search of Metal-bearing or other Valuable Minerals. Seventh edition, thoroughly revised and much enlarged. 8vo, cloth..... 1 50
- ANDERSON (WILLIAM).** On the Conversion of Heat into Work. A Practical Hand-book on Heat-Engines. Third edition. Illustrated. 12mo, cloth. 2 25
- ANDES (LOUIS).** Vegetable Fats and Oils; their Practical Preparation, Purification and Employment for various purposes. Their Properties. Adulteration and Examination. A Hand-book for Oil Manufacturers and Refiners, Candle, Soap and Lubricating Oil Manufacturers and the Oil and Fat Industry in general. Translated from the German. With 94 illustrations. 8vo, cloth. .... 4 00
- Animal Fats and Oils. Their Practical Production, Purification and Uses for a great variety of purposes, their Properties, Falsification and Examination. A Hand-book for Manufacturers of Oil and Fat Products, Soap and Candle Makers, Agriculturists, Tanners, etc. Translated by Charles Salter. With 62 illustrations. 8vo, cloth.... net 4 00
- ARNOLD (Dr. R.).** Ammonia and Ammonium Compounds. A Practical Manual for Manufacturers, Chemists, Gas Engineers and Drysalter. Second edition. 12mo, cloth..... 2 00
- ARNOLD (E.).** Armature Windings of Direct Current Dynamos. Extension and Application of a General Winding Rule. Translated from the original German by Francis B. DeGress, M. E. With numerous illustrations..... (In Press.)
- ATKINSON (PHILIP).** The Elements of Electric Lighting, including Electric Generation. Measurement, Storage, and Distribution. Ninth edition. Fully revised and new matter added. Illustrated. 12mo, cloth.. .... 1 50
- The Elements of Dynamic Electricity and Magnetism. Third edition. 120 illustrations. 12mo, cloth ..... 2 00

- ATKINSON (PHILIP).** Power Transmitted by Electricity and its Application by the Electric Motor, including Electric Railway Construction. New edition, thoroughly revised, and much new matter added. Illustrated 12mo, cloth.... 2 00
- Elements of Static Electricity, with full description of the Holtz and Topler Machines, and their mode of operating. Illustrated. 12mo, cloth ..... 1 50
- AUCHINCLOSS (W. S.).** Link and Valve Motions Simplified. Illustrated with 29 woodcuts and 20 lithographic plates, together with a Travel Scale, and numerous useful tables, Thirteenth edition, revised. 8vo, cloth..... 2 00
- AXON (W. E. A.).** The Mechanic's Friend. A Collection of Receipts and Practical Suggestions. 12mo, cloth ..... 1 50
- BACON (F. W.).** A Treatise on the Richards, Steam-Engine Indicator, with directions for its use. By Charles T. Porter. Revised, with notes and large additions as developed by American practice; with an appendix containing useful formulæ and rules for engineers. Illustrated. Fourth edition. 12mo, cloth . . . . . 1 00
- BADT (F. B.).** New Dynamo Tender's Hand book. With 140 illustrations. 18mo, cloth..... 1 00
- Bell Hangers' Hand-book. With 97 illustrations. Second edition. 18mo, cloth..... 1 00
- Incandescent Wiring Hand-book. With 35 illustrations and five tables. Fifth edition. 18mo, cloth. 1 00
- Electric Transmission Hand-book. With 22 illustrations and 27 tables. 18mo, cloth ..... 1 00
- BALE (M. P.).** Pumps and Pumping. A Hand-book for Pump Users. 12mo, cloth..... 1 00
- BARBA (J.).** The Use of Steel for Constructive Purposes. Method of Working, Applying, and Testing Plates and Bars With a Preface by A. L. Holley, C. E. 12mo, cloth..... 1 5
- BARKER (ARTHUR H.).** Graphic Methods of Engine Design. Including a Graphical Treatment of the Balancing of Engines. 12mo, cloth.... 1 5

- BARNARD (F. A. P.).** Report on Machinery and Processes of the Industrial Arts and Apparatus of the Exact Sciences at the Paris Universal Exposition, 1867. 152 illustrations and 8 folding plates. 8vo, cloth... . . . . . 5 00
- BARNARD (JOHN H.).** The Naval Militiaman's Guide. Full leather, pocket form..... 1 25
- BARWISE (SIDNEY, M. D., London).** The Purification of Sewage. Being a brief account of the Scientific Principles of Sewage Purification and their Practical Application. 12mo, cloth. Illustrated. 2 00
- BAUMEISTER (R.).** The Cleaning and Sewage of Cities. Adapted from the German with permission of the author. By J. M. Goodell, C. E. Second edition, revised and corrected, together with an additional appendix. 8vo, cloth. Illustrated..... 2 00
- BEAUMONT (ROBERT).** Color in Woven Design. With 32 Colored Plates and numerous original illustrations. Large 12mo..... 7 50
- BEAUMONT, W. and DUGALD CLERK.** Autocars and Horseless Carriages..... (In Press.)
- BECKWITH (ARTHUR).** Pottery. Observations on the Materials and Manufacture of Terra-Cotta, Stoneware, Fire-Brick, Porcelain, Earthenware, Brick, Majolica, and Encaustic Tiles. 8vo, paper. Second edition... . . . . . 60
- BERNTHSEN (A.).** A Text-Book of Organic Chemistry. Translated by George M'Gowan, Ph. D. Third English edition. Revised and extended by author and translator. Illustrated. 12mo, cloth..... 2 50
- BERTIN (L. E.).** Marine Boilers: Their Construction and Working, dealing more especially with Tubulous Boilers. Translated by Leslie S. Robertson, Upward of 250 illustrations. Preface by Sir William White. 8vo, cloth. Illustrated.... . . . . 7 50
- BIGGS (C. H. W.).** First Principles of Electricity and Magnetism. Being an attempt to provide an Elementary Book for those intending to enter the profession of Electrical Engineering. Second edition. 12mo, cloth. Illustrated..... 2 00



- BLAKE (W. P.).** Report upon the Precious Metals. Being Statistical Notices of the principal Gold and Silver producing regions of the world, represented at the Paris Universal Exposition. 8vo, cloth..... 2 00
- Ceramic Art. A Report on Pottery, Porcelain, Tiles, Terra-Cotta, and Brick. 8vo, cloth..... 2 00
- BLAKESLEY (T. H.).** Alternating Currents of Electricity. For the use of Students and Engineers. Third edition, enlarged. 12mo, cloth..... 1 50
- BLOUNT (BERTRAM).** Electro-Metallurgy .....  
(In Press.)
- BLYTH (A. WYNTER, M. R. C. S., F. C. S.).** Foods: their Composition and Analysis. A Manual for the use of Analytical Chemists, with an Introductory Essay on the History of Adulterations, with numerous tables and illustrations. Fourth edition, revised and enlarged. 8vo, cloth . . . . . 7 50
- Poisons: their Effects and Detection. A Manual for the use of Analytical Chemists and Experts, with an Introductory Essay on the growth of Modern Toxicology. Third edition, revised and enlarged. 8vo, cloth..... 7 50
- BODMER (G. R.).** Hydraulic Motors; Turbines and Pressure Engines, for the use of Engineers, Manufacturers and Students. Second edition, revised and enlarged. With 204 illustrations. 12mo, cloth..... 5 00
- BOILEAU (J. T.).** A New and Complete Set of Traverse Tables. Showing the Difference of Latitude and Departure of every minute of the Quadrant and to five places of decimals. 8vo, cloth. . . . . 5 00
- BOTTONE (S. R.).** Electrical Instrument Making for Amateurs. A Practical Hand-book. With 48 illustrations. Fifth edition, revised. 12mo, cloth..... 50
- Electric Bells, and all about them. A Practical Book for Practical Men. With more than 100 illustrations. 12mo, cloth. Fourth edition, revised and enlarged..... 50
- The Dynamo: How Made and How Used. A Book for Amateurs. Eighth edition. 12mo, cloth... 1 00

- 
- BOTTONE (S. R.).** Electro Motors : How Made and How Used. A Hand-book for Amateurs and Practical Men. Second edition. 12mo, cloth..... 50
- BONNEY (G. F.).** The Electro-Platers' Hand-book. A Manual for Amateurs and Young Students on Electro-Metallurgy. 60 illustrations, 12mo, cloth.. 1 20
- BOW (R. H.).** A Treatise on Bracing. With its application to Bridges and other Structures of Wood or Iron. 156 illustrations. 8vo, cloth..... 1 50
- BOWSER (Prof. E. A.).** An Elementary Treatise on Analytic Geometry. Embracing Plane Geometry, and an Introduction to Geometry of three Dimensions. 12mo, cloth. Nineteenth edition..... 1 75
- An Elementary Treatise on the Differential and Integral Calculus. With numerous examples. 12mo, cloth. Sixteenth edition.... 2 25
- An Elementary Treatise on Analytic Mechanics. With numerous examples. 12mo, cloth. Twelfth edition..... 3 00
- An Elementary Treatise on Hydro-Mechanics. With numerous examples. 12mo, cloth Fifth edition..... 2 50
- A Treatise on Roofs and Bridges. With Numerous Exercises. Especially adapted for school use. 12mo, cloth. Illustrated.....net 2 25
- Academic Algebra. Third edition. 12mo, cloth.. 1 25
- College Algebra. Fourth edition. 12mo, cloth.. 1 75
- Elements of Plane and Solid Geometry. 12mo, cloth. Second edition..... 1 40
- BOWIE (AUG J., Jun., M. E.).** A Practical Treatise on Hydraulic Mining in California. With Description of the Use and Construction of Ditches, Flumes, Wrought-iron Pipes and Dams ; Flow of Water on Heavy Grades, and its Applicability, under High Pressure, to Mining. Fifth edition. Small quarto, cloth. Illustrated..... 5 00
- BURGH (N. P.).** Modern Marine Engineering, applied to Paddle and Screw Propulsion. Consisting of 36 colored plates, 259 practical woodcut illustrations,

and 403 pages of descriptive matter. The whole being an exposition of the present practice of James Watt & Co., J. & G. Rennie, R. Napier & Sons, and other celebrated firms. Thick quarto, half morocco. 10 00

- BURT (W. A.).** Key to the Solar Compass, and Surveyor's Companion. Comprising all the rules necessary for use in the field; also description of the Linear Surveys and Public Land System of the United States. Notes on the Barometer, Suggestions for an Outfit for a Survey of Four Months, etc. Fifth edition. Pocket-book form, tuck ..... 2 50
- CALDWELL, (G. C.), and A. A. BRENEMAN.** Manual of Introductory Chemical Practice. For the use of Students in Colleges and Normal and High Schools. Fourth edition, revised and corrected. 8vo, cloth Illustrated..... 1 50
- CAMPIN (FRANCIS).** On the Construction of Iron Roofs. A Theoretical and Practical Treatise, with wood cuts and Plates of Roofs recently executed. 8vo, cloth..... 2 00
- CARTER (E. T.).** Motive Power and Gearing for Electrical Machinery. A Treatise on the Theory and Practice of the Mechanical Equipment of Power Stations for Electric supply and for Electric Traction. 8vo, cloth. Illustrated..... 5 00
- CHAMBER'S MATHEMATICAL TABLES,** consisting of logarithms of Numbers 1 to 108,000, Trigonometrical, Nautical, and other tables. New edition. 8vo, cloth..... 1 75
- CHAUVENET (Prof. W.).** New Method of Correcting Lunar Distances, and Improved Method of Finding the Error and Rate of a Chronometer, by Equal Altitudes. 8vo, cloth ..... 2 00
- CHRISTIE (W. WALLACE).** Chimney Design and Theory. A Book for Engineers and Architects, with numerous half-tone illustrations and plates of famous chimneys. 12mo, cloth..... 3 00
- CHURCH (JOHN A.).** Notes of a Metallurgical Journey in Europe. 8vo, cloth.... 2 00
- CLARK D. (KINNEAR, C. F.).** A Manual of Rules, Tables and Data for Mechanical Engineers. Based

- on the most recent investigations. Illustrated with numerous diagrams. 1,012 pages. 8vo, cloth. Sixth edition ..... 5 00  
 Half morocco ..... 7 50
- CLARK D. (KINNEAR, C. E.).** Fuel; its Combustion and Economy, consisting of abridgements of Treatise on the Combustion of Coal. By C. W. Williams; and the Economy of Fuel, by T. S. Prideaux. With extensive additions in recent practice in the Combustion and Economy of Fuel, Coal, Coke, Wood, Peat, Petroleum, etc. Fourth edition. 12mo, cloth.... 1 50
- The Mechanical Engineer's Pocket-book of Tables, Formulæ, Rules and Data. A Handy Book of Reference for Daily Use in Engineering Practice. 16mo, morocco. Second edition..... 3 00
- Tramways, their Construction and Working, embracing a comprehensive history of the system, with accounts of the various modes of traction, a description of the varieties of rolling stock, and ample details of Cost and Working Expenses. Second edition. Re-written and greatly enlarged, with upwards of 400 illustrations. Thick 8vo. cloth. 9 00
- The Steam Engine. A Treatise on Steam Engines and Boilers; comprising the Principles and Practice of the Combustion of Fuel, the Economical Generation of Steam, the Construction of Steam Boilers, and the Principles, Construction and Performance of Steam Engines, Stationary, Portable, Locomotive and Marine, exemplified in Engines and Boilers of recent date. 1,300 figures in the text, and a series of folding plates drawn to scale. 2 vols. 8vo, cloth. 15 00
- CLARK (JACOB M.).** A new System of Laying Out Railway Turn-outs instantly, by inspection from Tables. 12mo, leatherette..... 1 00
- CLAUSEN-THU (W.).** The A. B. C. Universal Commercial Electric Telegraphic Code, especially adapted for the use of Financiers, Merchants, Ship-owners, Brokers, Agent, etc. Fourth edition 8vo, cloth. .... 5 00
- The A1 Universal Commercial Electric Telegraphic Code. Over 1,240 pp., and nearly 90,000 variations. 8vo, cloth..... 7 50

- CLEEMANN (THOS. M.).** The Railroad Engineer's Practice. Being a Short but Complete Description of the Duties of the Young Engineer in the Preliminary and Location Surveys and in Construction. Fourth edition. Revised and enlarged. Illustrated. 12mo, cloth ..... 1 50
- CLERK (DUGALD).** Auto-cars or Horseless Vehicles. About 300 pp., 60 illustrations..... (In Press.)
- CLEVENGER (S. R.).** A Treatise on the Method of Government Surveying as prescribed by the U. S. Congress and Commissioner of the General Land Office, with complete Mathematical, Astronomical and Practical Instructions for the use of the United States Surveyors in the field. 16mo, morocco..... 2 50
- COFFIN (Prof. J. H. C.).** Navigation and Nautical Astronomy. Prepared for the use of the U. S. Naval Academy. New Edition. Revised by Commander Charles Belknap. 52 woodcut illustrations. 12mo, cloth .... net. 3 50
- COLE (R. S., M. A.).** A Treatise on Photographic Optics. Being an account of the Principles of Optics, so far as they apply to Photography. 12mo, cloth, 103 illustrations and foiding plates..... 2 50
- COLLINS (JAS. E.).** The private Book of Useful Alloys, and Memoranda for Goldsmiths, Jewelers, etc. 18mo, cloth ... 50
- CORNWALL (Prof. H. B.).** Manual of Blow-pipe Analysis, Qualitative and Quantitative. With a Complete System of Descriptive Mineralogy. 8vo, cloth. With many illustrations..... 2 50
- CRAIG (B. F.).** Weights and Measures. An Account of the Decimal System, with Tables of Conversion for Commercial and Scientific Uses. Square 32mo, limp cloth ..... 50
- CROCKER (F. B.).** Electric Lighting. A Practical Exposition of the Art, for use of Engineers, Students, and others interested in the Installation or Operation of Electrical Plants. Second edition. Revised. 8vo, cloth. Vol. 1. The Generating Plant ... 3 00  
Vol. 2..... (In Press.)

- 
- CROCKER, (F. B.), and S. S. WHEELER.** The Practical Management of Dynamos and Motors. Fourth edition (eighth thousand). Revised and enlarged. With a special chapter by H. A. Foster. 12mo, cloth. Illustrated..... 1 00
- CUMMING (LINNÆUS, M. A.).** Electricity treated Experimentally. For the use of Schools and Students New edition. 12mo, cloth ..... 1 50
- DAVIES (E. H.).** Machinery for Metalliferous Mines. A Practical Treatise for Mining Engineers, Metallurgists and Manufacturers. With upwards of 300 illustrations. 8vo, cloth ..... 5 00
- DAVIS (JOHN W., C. E.).** Formulæ for the Calculation of Railroad Excavation and Embankment, and for finding Average Haul. Second edition. Octavo, half roan..... 1 50
- DAY (CHARLES).** The Indicator and its Diagrams. With Chapters on Engine and Boiler Testing; Including a Table of Piston Constants compiled by W. H. Fowler. 12mo, cloth. 125 illustrations..... 2 00
- DERR (W. L.).** Block Signal Operation. A Practical Manual. Oblong, cloth..... 1 50
- DIXON (D. B.).** The Machinist's and Steam Engineer's Practical Calculator. A Compilation of Useful Rules and Problems arithmetically solved, together with General Information applicable to Shop-Tools, Mill-Gearing, Pulleys and Shafts, Steam-Boilers and Engines. Embracing valuable Tables and Instruction in Screw cutting, Valve and Link Motion, etc. 16mo, full morocco, pocket form..... 1 25
- DODD (GEO.).** Dictionary of Manufactures, Mining, Machinery, and the Industrial Arts. 12mo, cloth ... 1 50
- DORR (B. F.).** The Surveyor's Guide and Pocket Table Book. 18mo, morocco flaps. Third edition... 2 00
- DRAPER (C. H.).** An Elementary Text Book of Light, Heat and Sound, with Numerous Examples. Fourth edition. 12mo, cloth. Illustrated.. ..... 1 00
- Heat and the Principles of Thermo-Dynamics. With many illustrations and numerical examples. 12mo, cloth..... 1 50

- DUBOIS (A. J.).** The New Method of Graphic Statics. With 60 illustrations. 8vo, cloth..... 1 50
- EDDY (Prof. H. T.).** Researches in Graphical Statics. Embracing New Constructions in Graphical Statics, a New General Method in Graphical Statics, and the Theory of Internal Stress in Graphical Statics. 8vo, cloth..... 1 50
- Maximum Stresses under Concentrated Loads. Treated graphically. Illustrated. 8vo, cloth..... 1 50
- EISSLER (M.).** The Metallurgy of Gold ; a Practical Treatise on the Metallurgical Treatment of Gold-Bearing Ores, including the Processes of Concentration and Chlorination, and the Assaying, Melting and Refining of Gold. Fourth Edition, revised and greatly enlarged. 187 illustrations. 12mo, cloth 5 00
- The Metallurgy of Silver ; a Practical Treatise on the Amalgamation, Roasting and Lixivation of Silver Ores, including the Assaying, Melting and Refining of Silver Bullion. 124 illustrations. Second edition, enlarged, 12mo, cloth . . . . . 4 00
- The Metallurgy of Argentiferous Lead ; a Practical Treatise on the Smelting of Silver Lead Ores and the Refining of Lead Bullion. Including Reports on Various Smelting Establishments and Descriptions of Modern Smelting Furnaces and Plants in Europe and America. With 183 illustrations. 8vo, cloth ..... 5 00
- Cyanide Process for the Extraction of Gold and its Practical Application on the Witwatersrand Gold Fields in South Africa. Second edition. Enlarged. 8vo, cloth. Illustrations and folding plates..... 3 00
- A Hand-book on Modern Explosives, being a Practical Treatise on the Manufacture and use of Dynamite, Gun Cotton, Nitro-Glycerine and other Explosive Compounds, including the manufacture of Collodion-Cotton, with chapters on explosives in practical application. Second edition, enlarged with 150 illustrations. 12mo, cloth..... 5 00
- LIOT (C. W.), and STORER (F. H.).** A compendious Manual of Qualitative Chemical Analysis. Revised with the co-operation of the authors, by Prof. William R. Nichols Illustrated. Nineteenth edition, newly revised by Prof. W. B. Lindsay, 12mo. cloth..... 1 25

- ELLIOT (Maj. GEO. H.).** European Light-House Systems. Being a Report of a Tour of Inspection made in 1873. 51 engravings and 21 woodcuts. 8vo, cloth ..... 5 00
- ELLISON, (LEWIS M.).** Practical Application of the Indicator. With reference to the adjustment of Valve Gear on all styles of Engines. Second edition, revised. 8vo. cloth, 100 illustrations..... 2 00
- EVERETT (J. D.).** Elementary Text-book of Physics. Illustrated. Seventh edition. 12mo, cloth 1 50
- EWING (Prof. A. J.).** The Magnetic Induction in Iron and other metals. 159 illustrations. 8vo, cloth 4 00
- FANNING (J. T.).** A Practical Treatise on Hydraulic and Water-Supply Engineering. Relating to the Hydrology, Hydro-dynamics, and Practical Construction of Water-Works in North America. 180 illustrations. 8vo, cloth. Fourteenth edition, revised, enlarged, and new tables and illustrations added. 650 pages..... 5 00
- FISH (J. C. L.).** Lettering of Working Drawings. Thirteen plates, with descriptive text. Oblong, 9x12½, boards..... 1 00
- FISKE (Lieut. BRADLEY A., U. S. N.).** Electricity in Theory and Practices or, The Elements of Electrical Engineering. Eighth edition. 8vo, cloth 2 50
- FISHER (H. K. C. and DARBY, W. C.).** Students' Guide to Submarine Cable Testing. 8vo, cloth..... 2 50
- FISHER (W. C.).** The Potentiometer and its Adjuncts. 8vo, cloth..... 2 25
- FLEISCHMANN (W.).** The Book of the Dairy. A Manual of the Science and Practice of Dairy Work. Translated from the German, by C. M. Aikman and R. Patrick Wright. 8vo, cloth..... 4 00
- FLEMING (Prof. J. A.).** The Alternate Current Transformer in Theory and Practice. Vol. 1—The Induction of Electric Currents; 611 pages. New edition. Illustrated. 8vo, cloth..... 5 00  
Vol. 2. The Utilization of Induced Currents. Illustrated. 8vo, cloth ..... 5 00
- Electric Lamps and Electric Lighting. Being a course of four lectures delivered at the Royal Institution, April-May, 1894. 8vo, cloth, fully illustrated 3 00



- FLEMING (Prof. J. A.).** Electrical Laboratory Notes and Forms, Elementary and advanced. 4to, cloth, illustrated..... 5 00
- FOLEY (NELSON), and THOS. PRAY, Jr.** The Mechanical Engineers' Reference Book for Machine and Boiler Construction, in 2 parts. Part 1—General Engineering Data. Part 2—Boiler Construction. With fifty-one plates and numerous illustrations, specially drawn for this work. Folio, half mor ...25 00
- FORNEY (MATTHIAS N.).** Catechism of the Locomotive. Second edition, revised and enlarged. Forty-sixth thousand. 8vo, cloth..... 3 50
- FOSTER (Gen. J. G., U. S. A.).** Submarine Blasting in Boston Harbor, Massachusetts. Removal of Tower and Corwin Rocks. Illustrated with 7 plates. 4to, cloth..... 3 50
- FOSTER (H. A.).** Electrical Engineers' Pocket Book. 1000 pages with the collaboration of Eminent Specialists .. (In press)
- FOSTER (JAMES).** Treatise on the Evaporation on Saccharine, Chemical and other Liquids by the Multiple System in Vacuum and Open Air. Second edition. Diagrams and large plates. 8vo, cloth.... 7 50
- FOWLER.** Mechanical Engineers' Pocket Book for 1900..... 1 00
- FOX (WM.), and C. W. THOMAS, M. E.** A Practical Course in Mechanical Drawing. 12mo, cloth with plates ..... 1 25
- FRANCIS (JAS. B., C. E.).** Lowell Hydraulic Experiments. Being a selection from experiments on Hydraulic Motors, on the Flow of Water over Weirs, in open Canals of uniform rectangular section, and through submerged Orifices and diverging Tubes. Made at Lowell, Mass. Fourth edition, revised and enlarged, with many new experiments, and illustrated with 23 copper-plate engravings. 4to, cloth.....15 00
- FROST (GEO. H.).** Engineer's Field Book. By C. S. Cross. To which are added seven chapters on Railroad Location and Construction. Fourth edition. 12mo, cloth.... 1 00

- FULLER (GEORGE W.).** Report on the Investigations into the Purification of the Ohio River Water at Louisville, Kentucky, made to the President and Directors of the Louisville Water Company. Published under agreement with the Directors. 4to, cloth. 3 full page plates.....net 10 00
- GEIPEL (WM.), and KILGOUR, (M. H.)** A Pocketbook of Electrical Engineering Formula. Illustrated. 18mo, morocco..... 3 00  
Large paper edition, wide margins. 8vo, morocco, gilt edges..... 5 00
- GERBER (NICHOLAS).** Chemical and Physical Analysis of Milk, Condensed Milk and Infant's Milk-Food. 8vo, cloth.... 1 25
- GIBBS (WILLIAM E.).** Lighting by Acetylene, Generators, Burners and Electric Furnaces. With 66 illustrations. Second edition revised. 12mo, cloth.. 1 50
- GILLMORE (GEN. O. A.).** Treatise on Limes, Hydraulic Cements, and Mortars. Papers on Practical Engineering, United States Engineer Department, No. 9, containing Reports of numerous Experiments conducted in New York City during the years of 1858 to 1861, inclusive. With numerous illustrations. 8vo cloth.... 4 00
- Practical Treatise on the Construction of Roads, Streets, and Pavements, with 70 illustrations. 12mo, cloth. .... 2 00
- Report on Strength of Building Stones in the United States, etc. 8vo, illustrated cloth..... 1 00
- GOLDING (HENRY A.).** The Theta-Phi Diagram. Practically applied to Steam, Gas, Oil and Air Engines. 12mo, cloth. Illustrated. ....net 1 25
- GOODEVE (T. M.).** A Text-Book on the Steam Engine. With a Supplement on Gas-Engines. Twelfth Edition, enlarged. 143 illustrations. 12mo, cloth... 2 00
- GORDON (J. E. H.).** School Electricity. Illustrations. 12mo, cloth..... 2 00
- GORE (G., F. R. S.).** The Art of Electrolytic Separation of Metals, etc. (Theoretical and Practical.) Illustrated. 8vo, cloth.... 3 50
- Electro Chemistry Inorganic. Third Edition. 8vo, cloth..... 80

- 
- GOULD (E. SHERMAN).** The Arithmetic of the Steam Engine. 8vo, cloth..... 1 00
- GRIFFITHS (A. D., Ph. D.).** A Treatise on Manures, or the Philosophy of Manuring. A Practical Handbook for the Agriculturist, Manufacturer and Student. 12mo, cloth..... 3 00
- GROVER (FREDERICK).** Practical Treatise on Modern Gas and Oil Engines. 8vo, cloth. Illustrated 2 00
- GURDEN (RICHARD LLOYD).** Traverse Tables: computed to 4 places Decimals for every ° of angle up to 100 of Distance. For the use of Surveyors and Engineers. New Edition. Folio, half morocco. .. 7 50
- GUY ARTHUR (F.).** Electric Light and Power, giving the Result of Practical Experience in Central Station Work. 8vo, cloth. Illustrated.. 2 50
- HAEDER (HERMAN C. E.).** A Hand-book on the Steam Engine. With especial reference to small and medium sized engines. English edition re-edited by the author from the second German edition, and translated with considerable additions and alterations by H. H. P. Powels. 12mo, cloth. Nearly 1100 illustrations.... 3 00
- HALL (WM. S. Prof.).** Elements of the Differential and Integral Calculus. Second edition. 8vo, cloth. Illustrated.....net 2 25
- HALSEY (F. A.).** Slide Valve Gears; an Explanation of the action and Construction of Plain and Cut-off Slide Valves. Illustrated. 12mo, cloth. Sixth edition..... 1 50
- The Use of the Slide Rule. Illustrated with diagrams and folding plates. 16mo, boards..... 50
- HAMILTON (W. G.).** Useful Information for Railway Men. Tenth Edition, revised and enlarged. 562 pages, pocket form. Morocco, gilt..... 2 00
- HANCOCK (HERBERT).** Text Book of Mechanics and Hydrostatics, with over 500 diagrams. 8vo, cloth ... 1 75
- HARRISON (W. B.).** The Mechanics' Tool Book. With Practical Rules and Suggestions for use of Machinists, Iron-Workers, and others. Illustrated with 44 engravings. 12mo, cloth..... 1 50

- 
- HASKINS (C. H.).** The Galvanometer and its Uses. A Manual for Electricians and Students. Fourth edition. 12mo, cloth..... 1 50
- HAWKE (WILLIAM H.).** The Premier Cipher Telegraphic Code Containing 100,000 Words and Phrases. The most complete and most useful general code yet published. 4to, cloth ..... 5 00
- 100,000 Words; Supplement to the Premier Code. All the words are selected from the official vocabulary. Oblong quarto, cloth..... 4 20
- HAWKINS (C. C.) and WALLIS (F.).** The Dynamo; its Theory, Design and Manufacture. 190 illustrations, 12mo, cloth..... 3 00
- HAY (ALFRED).** Principles of Alternate-Current Working. 12mo, cloth, illustrated ... 2 00
- HEAP (Major D. P., U. S. A.).** Electrical Appliances of the Present Day. Report of the Paris Electrical Exposition of 1881. 250 illustrations. 8vo, cloth..... 2 00
- HEAVISIDE (OLIVER).** Electromagnetic Theory. 8vo, cloth, two volumes each..... 5 00
- HENRICI (OLAUS).** Skeleton Structures, Applied to the Building of Steel and Iron Bridges. Illustrated 1 50
- HERRMANN (GUSTAV).** The Graphical Statics of Mechanism. A Guide for the Use of Machinists, Architects, and Engineers; and also a Text-book for Technical Schools. Translated and annotated by A. P. Smith, M. E. 12mo, cloth, 7 folding plates. Third Edition..... 2 00
- HERMANN (FELIX).** Painting on Glass and Porcelain and Enamel Painting. On the Basis of Personal Practical Experience of the Condition of the Art up to date. Translated by Charles Salter. Second greatly enlarged edition. 8vo, cloth, Illustrations, net..... 3 50
- HEWSON (WM.).** Principles and Practice of Embanking Lands from River Floods, as applied to the Levees of the Mississippi. 8vo, cloth..... 2 00
- HILL (JOHN W.).** The Purification of Public Water Supplies. Illustrated with valuable Tables, Diagrams and Cuts. 8vo, cloth, 304 pages..... 3 00
- The Interrelation of Water Analyses..(In Press)

<b>HOBBS (W. R. P.).</b> The Arithmetic of Electrical Measurements with numerous examples. Fully Worked, 12mo, cloth.....	.50
<b>HOFF (WM. B., Com. U. S. Navy.).</b> The Avoidance of Collisions at Sea. 18mo, morocco .....	.75
<b>HOLLEY (ALEXANDER L.).</b> Railway Practice. American and European Railway practice in the Economical Generation of Steam. 77 lithographed plates. Folio, cloth .....	12 00
<b>HOLMES (A. BROMLEY).</b> The Electric Light Popularly Explained. Fifth Edition. Illustrated. 12mo, paper .....	.40
<b>HOPKINS (NEVIL M.).</b> Model Engines and small Boats. New Methods of Engine and Boiler Making with a chapter on Elementary Ship Design and Construction. 12mo, cloth.....	1 25
<b>HOSPITALIER (E.).</b> Polyphased Alternating Currents. Illustrated. 8vo, cloth.....	1 40
<b>HOWARD (C. R.).</b> Earthwork Mensuration on the Basis of the Prismoidal Formulae. Containing Simple and Labor-saving Methods of obtaining Prismoidal Contents directly from End Areas. Illustrated by Examples and accompanied by Plain Rules for Practical Uses. Illustrated. 8vo, cloth....	1 50
<b>HUMBER (WILLIAM, C. E.).</b> A Handy Book for the Calculation of Strains in Girders and Similar Structures, and their Strength; Consisting of Formulae and Corresponding Diagrams, with numerous details for practical application, etc. Fourth Edition. 12mo, cloth.....	2 50
<b>HURST (GEORGE H.).</b> Colour; A Hand-book of the Theory of Colour. Containing ten coloured plates and 72 diagrams. 8vo, cloth. Illustrated. Price....	2 50
— Lubricating Oils, Fats and Greases. Their Origin, Preparation, Properties, Uses and Analysis. 313 pages, with 65 illustrations. 8vo, cloth.....	3 00
— Soaps; A Practical Manual of the Manufacture of Domestic, Toilet and other Soaps. Illustrated with 66 Engravings. 8vo, cloth.....	5 00

- 
- HUTCHINSON (W. B.).** Patents and How to Make Money out of Them. Member of New York Bar. 12mo, cloth. New York, 1899 ..... 1 25
- HUTTON (W. S.).** Steam Boiler Construction. A Practical Hand-book for Engineers, Boiler Makers and Steam Users. Containing a large collection of rules and data relating to recent practice in the design, construction, and working of all kinds of stationary, locomotive and marine steam boilers. With upwards of 500 illustrations. Third edition. Carefully revised and much enlarged. 8vo, cloth... 6 00
- Practica Engineer's Hand-book, Comprising a treatise on Modern Engines and Boilers, Marine, Locomotive and Stationary. Fourth edition. Carefully revised with additions. With upwards of 570 illustrations. 8vo, cloth..... 7 00
- The Works' Manager's Hand-book of Modern Rules, Tables, and Data for Civil and Mechanical Engineers. Millwrights and Boiler Makers, etc., etc. With upwards of 150 illustrations. Fifth edition. Carefully revised, with additions. 8vo, cloth..... 6 00
- INNES (CHARLES H.).** Problems in Machine Design. For the Use of Students, Draughtsmen and others. 12mo, cloth..... 1 50
- Centrifugal Pumps, Turbines and Water Motors. Including the Theory and Practice of Hydraulics. 12mo, cloth..... 1 50
- ISHERWOOD (B. F.).** Engineering Precedents for Steam Machinery. Arranged in the most practical and useful manner for Engineers. With illustrations. 2 vols. in 1. 8vo, cloth..... 2 50
- JAMESON (CHARLES D.).** Portland Cement. Its Manufacture and Use. 8vo, cloth..... 1 50
- JAMIESON (ANDREW C. E.).** A Text-Book on Steam and Steam Engines. Specially arranged for the use of Science and Art, City and Guilds of London Institute, and other Engineering Students. Tenth edition. Illustrated. 12mo, cloth..... 3 00
- Elementary Manual on Steam and the Steam Engine. Specially arranged for the use of First-Year Science and Art, City and Guilds of London Institute, and other Elementary Engineering Students. Third edition. 12mo, cloth ..... 1 40

- JANNETTAZ (EDWARD).** A Guide to the Determination of Rocks: being an Introduction to Lithology. Translated from the French by G. W. Plympton, Professor of Physical Science at Brooklyn Polytechnic Institute. 12mo, cloth..... 1 50
- JOHNSTON, Prof. J. F. W., and CAMERON, Sir CHAS.** Elements of Agricultural Chemistry and Geology. Seventeenth edition. 12mo, cloth..... 2 60
- JOYNSON (F. H.).** The Metals used in Construction. Iron, Steel, Bessemer Metal, etc. Illustrated. 12mo, cloth ..... 75
- Designing and Construction of Machine Gearing. Illustrated. 8vo, cloth.. ..... 2 00
- KANSAS CITY BRIDGE (THE.)** With an Account of the Regimen of the Missouri River and a Description of the Methods used for Founding in that River. By O. Chanute, Chief Engineer, and George Morrison, Assistant Engineer. Illustrated with 5 lithographic views and 12 plates of plans. 4to, cloth... 6 00
- KAPP (GISBERT C. E.).** Electric Transmission of Energy and its Transformation, Subdivision, and Distribution. A Practical Hand-book. Fourth edition, revised. 12mo, cloth..... 3 50
- Dynamos, Alternators and Transformers. 138 Illustrations. 12mo, cloth..... 4 00
- KEMPE (H. R.).** The Electrical Engineer's Pocket-Book of Modern Rules, Formulæ, Tables and Data. Illustrated. 32mo, mor. gilt..... 1 75
- KENNELLY (A. E.).** Theoretical Elements of Electro-Dynamic Machinery. 8vo, cloth..... 1 50
- KILGOUR, M. H., SWAN, H., and BIGGS, C. H. W.** Electrical Distribution; its Theory and Practice. 174 Illustrations. 12mo, cloth..... 4 00
- KING (W. H.).** Lessons and Practical Notes on Steam. The Steam Engine, Propellers, etc., for Young Marine Engineers, Students, and others. Revised by Chief Engineer J. W. King, United States Navy. Nineteenth edition, enlarged. 8vo, cloth ... 2 00
- KINGDON (J. A.).** Applied Magnetism. An introduction to the Design of Electromagnetic Apparatus. 8vo, cloth..... 3 00

- KIRKALDY (WM. G.).** Illustrations of David Kirkaldy's System of Mechanical Testing, as Originated and Carried On by him during a Quarter of a Century. Comprising a Large Selection of Tabulated Results, showing the Strength and other Properties of Materials used in Construction, with explanatory Text and Historical Sketch. Numerous engravings and 25 lithographed plates. 4to, cloth.....20 00
- KIRKWOOD (JAS. P.).** Report on the Filtration of River Waters for the supply of Cities, as practised in Europe, made to the Board of Water Commissioners of the City of St. Louis. Illustrated by 30 double-plate engravings. 4to, cloth..... 7 50
- LARRABEE (C. S.).** Cipher and Secret Letter and Telegraphic Code, with Hog's Improvements. The most perfect Secret Code ever invented or discovered. Impossible to read without the key. 18mo, cloth ..... 60
- LAZELLE (H. M.).** One Law in Nature. A New Corpuscular Theory comprehending Unity of Force, Identity of Matter, and its Multiple Atom Constitution, etc. 12mo, cloth..... 1 50
- LEASK (A. RITCHIE).** Breakdowns at Sea and How to Repair Them. With eighty-nine illustrations. 8vo, cloth. Second edition..... 2 00
- Triple and Quadruple Expansion Engines and Boilers and their Management. With fifty-nine illustrations. Third edition, revised. 12mo, cloth.. 2 00
- Refrigerating Machinery: Its Principles and Management. With sixty-four illustrations. 12mo, cloth ..... 2 00
- LECKY (S. T. S.).** "Wrinkles" in Practical Navigation. With 130 illustrations. 8vo, cloth. Ninth edition, revised..... 8 40
- LEVY (C. L.).** Electric Light Primer. A Simple and Comprehensive Digest of all of the most important facts connected with the running of the dynamo, and electric lights, with precautions for safety. For the use of persons whose duty it is to look after the plant. 8vo, paper..... 50



- LIVACHE (ACH., Ingenieur Civil Des Mines).** The Manufacture of Varnishes, Oil Crushing, Refining and Boiling and Kindred Industries. Translated from the French and greatly extended, by John Geddes McIntosh. 8vo, cloth. Illustrated.....net 5 00
- LOCKE (ALFRED G., and CHARLES G.)** A Practical Treatise on the Manufacture of Sulphuric Acid. With 77 Constructive Plates drawn to scale Measurements, and other Illustrations. Royal 8vo, cloth. 10 00
- LOCKERT (LOUIS).** Petroleum Motor-Cars. 12mo, cloth ..... 1 50
- LOCKWOOD (THOS. D.).** Electricity, Magnetism, and Electro-Telegraphy. A Practical Guide for Students, Operators, and Inspectors. 8vo, cloth. Third edition..... 2 50
- Electrical Measurement and the Galvanometer; its Construction and Uses. Second edition. 32 illustrations. 12mo, cloth..... 1 50
- LODGE (OLIVER J)** Elementary Mechanics, including Hydrostatics and Pneumatics. Revised edition. 12mo, cloth ..... 1 50
- LORING (A. E.).** A Pocket-Book of the Electro-Magnetic Telegraph. Paper boards..... 50  
Cloth. .... 75  
Morocco..... 1 00
- LUCE (Com. S. B.).** Pocket-Book of Seamanship. The Equipping and Heaving of Vessels under Sail or Steam. For the use of the U. S. Naval Academy. Revised and enlarged edition, by Lt. Wm. S. Benson. 8vo, cloth..... 10 00
- LUNGE (GEO.).** A Theoretical and Practical Treatise on the Manufacture of Sulphuric Acid and Alkali with the Collateral Branches. Vol. I. Sulphuric Acid, Second edition, revised and enlarged. 342 illustrations. 8vo, cloth..... 15 00  
Vol. II. Second edition, revised and enlarged. 8vo, cloth..... 16 80  
Vol III. 8vo, cloth. New edition, 1896..... 15 00
- LUNGE. (GEO.), and HURTER, F.** The Alkali Maker's Pocket-Book. Tables and Analytical Methods for Manufacturers of Sulphuric Acid, Nitric Acid, Soda, Potash and Ammonia. Second edition. 12mo, cloth ..... 3 00

- LUQUER (LEA McILVAINE, Ph. D.).** Minerals in Rock Sections. The Practical Method of Identifying Minerals in Rock Sections with the microscope, Especially arranged for Students in Technical and Scientific Schools. 8vo. cloth. Illustrated..net 1 50
- MACCORD (Prof. C. W.).** A Practical Treatise on the Slide-Valve by Eccentrics, examining by methods the action of the Eccentric upon the Slide-Valve, and explaining the practical processes of laying out the movements, adapting the Valve for its various duties in the Steam Engine. Second edition. Illustrated. 4to, cloth..... 2 50
- MAGUIRE (Capt. EDWARD. U. S. A.).** The Attack and Defence of Coast Fortifications. With Maps and Numerous Illustrations. 8vo, cloth..... 2 50
- MAGUIRE (WM. R.).** Domestic Sanitary Drainage and Plumbing Lectures on Practical Sanitation. 332 illustrations. 8vo..... 4 00
- MARKS (EDWARD C. R.).** Mechanical Engineering Materials: their Properties and Treatment in Construction. 12mo, cloth. Illustrated..... 60
- Notes on the Construction of Cranes and Lifting Machinery. 12mo, cloth... 1 00
- MARKS (G. C.).** Hydraulic Machinery Employed in the Concentration and Transmission of Power. 12mo, cloth..... 1 25
- MAVER (WM.).** American Telegraphy: Systems, Apparatus, Operation. 450 illustrations. 8vo, cloth. 3 50
- MAYER (Prof. A. M.).** Lecture Notes on Physics. 8vo, cloth..... 2 00
- McCULLOCH (Prof. R. S.).** Elementary Treatise on the Mechanical Theory of Heat, and its application to Air and Steam Engines. 8vo, cloth..... 3 50
- McNEILL (BEDFORD).** McNeill's Code. Arranged to meet the requirements of Mining, Metallurgical and Civil Engineers, Directors of Mining, Smelting and other Companies, Bankers, Stock and Share Brokers, Solicitors, Accountants, Financiers, and General Merchants. Safety and Secrecy. 8vo, cloth. 6 00

- MERRILL (Col. WM. E., U. S. A.).** Iron Truss Bridges for Railroads. The method of calculating strains in Trusses, with a careful comparison of the most prominent Trusses, in reference to economy in combination, &c. Illustrated. 4to, cloth. Fourth Edition ..... 5 00
- METAL TURNING.** By a Foreman Pattern Maker. Illustrated with 81 engravings. 12mo, cloth..... 1 50
- MINIFIE (WM.).** Mechanical Drawing. A Text-book of Geometrical Drawing for the use of Mechanics and Schools, in which the Definitions and Rules of Geometry are familiarly explained; the Practical Problems are arranged from the most simple to the more complex, and in their description technicalities are avoided as much as possible. With illustrations for Drawing Plans, Sections, and Elevations of Railways and Machinery; an Introduction to Isometric Drawing, and an Essay on Linear Perspective and Shadows. Illustrated with over 200 diagrams engraved on steel. Ninth thousand. With an appendix on the Theory and Application of Colors. 8vo, cloth ..... 4 00
- Geometrical Drawing. Abridged from the Octavo edition, for the use of schools. Illustrated with 48 steel plates. Ninth edition. 12mo, cloth.... 2 00
- MODERN METEOROLOGY.** A Series of Six Lectures, delivered under the auspices of the Meteorological Society in 1870. Illustrated. 12mo, cloth . 1 50
- MOREING (C. A.), and NEAL (THOMAS).** Telegraphic Mining Code Alphabetically arranged. Second edition. 8vo, cloth..... 8 40
- MORRIS (E.).** Easy Rules for the Measurement of Earthworks by means of the Prismoidal Formula. 8vo, cloth. Illustrated..... 1 50
- MOSES (ALFRED J.), and PARSONS, C. L.** Elements of Mineralogy. Crystallography and Blowpipe Analysis from a practical standpoint. Second thousand. 8vo, cloth. 366 illustrations.....net 2 00
- MOSES (ALFRED J.).** The Characters of Crystals. An Introduction to Physical Crystallography, containing 321 Illustrations and Diagrams. 8vo, 211 pp.....net 2 00

- MOELLER (F. C. G.).** Krupp's Steel Works. With 88 illustrations. By Felix Schmidt and Montan. Authorized Translation from the German. 4to, cloth.....(In Press.)
- MULLIN (JOSEPH P., M. E.).** Modern Moulding and Pattern-Making. A Practical Treatise upon Pattern Shop and Foundry Work; embracing the Moulding of Pulleys, Spur Gears, Worm Gears, Balance-Wheels, Stationary Engine and Locomotive Cylinders, Globe Valves, Tool Work, Mining Machinery, Screw Propellers, Pattern-Shop Machinery, and the latest improvements in English and American Cupolas; together with a large collection of original and carefully selected Rules and Tables for everyday use in the Drawing Office, Pattern-Shop and Foundry. 12mo, cloth. Illustrated..... 2 50
- MUNRO (JOHN C. E.), and JAMIESON ANDREW C. E.** A Pocket-book of Electrical Rules and Tables for the use of Electricians and Engineers. Thirteenth edition, revised and enlarged. With numerous diagrams. Pocket size. Leather.. 2 50
- MURPHY (J. G., M. E.).** Practical Mining. A Field Manual for Mining Engineers. With Hints for Investors in Mining Properties. 16mo, morocco tucks..... 1 00
- NAQUET (A.).** Legal Chemistry. A Guide to the Detection of Poisons, Falsification of Writings, Adulteration of Alimentary and Pharmaceutical Substances, Analysis of Ashes, and examination of Hair, Coins, Arms, and Stains, as applied to Chemical Jurisprudence. Translated from the French, by J. P. Battershall, Ph D., with a preface by C. F. Chaudler, Ph. D., M. D., LL. D. 12mo, cloth..... 2 00
- NASMITH (JOSEPH).** The Student's Cotton Spinning. Third edition, revised and enlarged. 8vo, cloth. 622 pages. 250 Illustrations..... 3 00
- NEWALL (JOHN W.).** Plain Practical Directions for Drawing, Sizing and Cutting Bevel-Gears, showing how the Teeth may be cut in a Plain Milling Machine or Gear Cutter so as to give them a correct shape from end to end; and showing how to get out all particulars for the Workshop without making any Drawings. Including a Full Set of Tables of Reference. Folding plates. 8vo, cloth..... 1 50



- PERRINE (F. A. C., A. M., D. Sc.).** Conductors for Electrical Distribution; their Manufacture and Materials, the Calculation of Circuits, Pole Line Construction, Underground Working and other Uses. (In Press.)
- PERRY (JOHN).** Applied Mechanics. A Treatise for the use of students who have time to work experimental, numerical and graphical exercises illustrating the subject. 8vo, cloth. 650 pages., net 2 50
- PHILLIPS (JOSHUA).** Engineering Chemistry. A Practical Treatise for the use of Analytical Chemists, Engineers, Iron Masters, Iron Founders, students and others. Comprising methods of Analysis and Valuation of the principal materials used in Engineering works, with numerous Analyses, Examples and Suggestions. 314 illustrations. Second edition, revised and enlarged. 8vo, cloth..... 4 00
- PICKWORTH (CHAS. N.).** The Indicator Handbook. A Practical Manual for Engineers. Part I. The Indicator: Its Construction and Application. 81 illustrations. 12mo, cloth..... 1 50
- The Slide Rule. A Practical Manual of Instruction for all Users of the Modern Type of Slide Rule, exhibiting the Application of the Instrument to the Everyday Work of the Engineer,—Civil, Mechanical and Electrical. 12mo, flexible cloth. Fifth edition. 80
- PLANE TABLE (THE).** Its Uses in Topographical Surveying. From the Papers of the United States Coast Survey. Illustrated. 8vo, cloth..... 2 00
- PLANTE (GASTON).** The Storage of Electrical Energy, and Researches in the Effects created by Currents, combining Quantity with High Tension. Translated from the French by Paul B. Elwell. 89 illustrations. 8vo..... 4 00
- PLATTNER.** Manual of Qualitative and Quantitative Analysis with the Blow-Pipe. From the last German edition, revised and enlarged, by Prof. Th. Richter, of the Royal Saxon Mining Academy. Translated by Prof. H. B. Cornwall, assisted by John H. Caswell. Illustrated with 87 wood-cuts and one lithographic plate. Seventh edition, revised. 560 pages. 8vo, cloth..... 5 00

- PLYMPTON (Prof. GEO. W.).** The Blow Pipe. A Guide to its use in the Determination of Salts and Minerals. Compiled from various sources. 12mo, cloth ..... 1 50
- The Aneroid Barometer: its Construction and Use. Compiled from several sources. Fourth edition. 16mo, boards. Illustrated... .. 50  
Morocco..... .. 1 00
- POCKET LOGARITHMS,** to Four Places of Decimals, including Logarithms of Numbers, and Logarithmic Sines and Tangents to Single Minutes. To which is added a Table of Natural Sines, Tangents, and Co-Tangents. 16mo, boards..... 50
- POPE (F. L.).** Modern Practice of the Electric Telegraph. A Technical Hand-book for Electricians, Managers and Operators. Fifteenth edition, rewritten and enlarged, and fully illustrated. 8vo, cloth. 1 50
- POPPELWELL (W. C.).** Elementary Treatise on Heat and Heat Engines. Specially adapted for engineers and students of engineering. 12mo, cloth. Illustrated..... 3 00
- POWLES (H. H.).** Steam Boilers.....(In Press.)
- PRAY (Jr., THOMAS).** Twenty Years with the Indicator; being a Practical Text-Book for the Engineer or the Student, with no complex Formulæ. Illustrated. 8vo, cloth..... 2 50
- Steam Tables and Engine Constant. Compiled from Regnault, Rankine and Dixon directly, making use of the exact records. 8vo, cloth..... 2 00
- PRACTICAL IRON FOUNDING.** By the Author of "Pattern Making," &c., &c. Illustrated with over one hundred engravings. 12mo, cloth..... 1 50
- PREECE (W. H.).** Electric Lamps .....(In Press.)
- PREECE (W. H.), and STUBBS, A. T.** Manual of Telephony. Illustrations and plates. 12mo, cloth. 4 50
- PREMIER CODE.** (See Hawk, Wm. H.)
- PRESCOTT (Prof. A. B.).** Organic Analysis. A Manual of the Descriptive and Analytical Chemistry of certain Carbon Compounds in Common Use: a Guide in the Qualitative and Quantitative Analysis of Organic Materials in Commercial and Pharmacia-

- ceutical Assays, in the estimation of Impurities under Authorized Standards, and in Forensic Examinations for Poisons, with Directions for Elementary Organic Analysis. Fourth edition. 8vo, cloth..... 5 00
- PRESCOTT (Prof. A. B.).** Outlines of Proximate Organic Analysis, for the Identification, Separation, and Quantitative Determination of the more commonly occurring Organic Compounds. Fourth edition. 12mo, cloth .. . . . . . 1 75
- First Book in Qualitative Chemistry. Eighth edition. 12mo, cloth . . . . . 1 50
- and Otis Coe Johnson. Qualitative Chemical Analysis. A Guide in the Practical Study of Chemistry and in the work of Analysis. Fourth fully revised edition. With Descriptive Chemistry extended throughout..... 3 50
- PRITCHARD (O. G.).** The Manufacture of Electric Light Carbons. Illustrated. 8vo, paper ..... 60
- PULLEN (W. W. F.).** Application of Graphic Methods to the Design of Structures. Specially prepared for the use of Engineers. 12mo, cloth. Illustrated. net 2 50
- PULSIFER (W. H.).** Notes for a History of Lead. 8vo, cloth, gilt tops..... 4 00
- PYNCHON (Prof. T. R.).** Introduction to Chemical Physics, designed for the use of Academies, Colleges, and High Schools. Illustrated with numerous engravings, and containing copious experiments with directions for preparing them. New edition, revised and enlarged, and illustrated by 269 illustrations on wood. 8vo, cloth..... 3 00
- RADFORD (Lieut. CYRUS S.).** Hand-book on Naval Gunnery. Prepared by Authority of the Navy Department. For the use of U. S. Navy, U. S. Marine Corps and U. S. Naval Reserves. Revised and enlarged, with the assistance of Stokely Morgan, Lieut. U. S. N. Third edition. 12mo, flexible leather. 2 00
- RAFTER (GEO. W.), and M. N. BAKER.** Sewage Disposal in the United States. Illustrations and folding plates. Second edition. 8vo, cloth..... 6 00
- RAM (GILBERT S.).** The Incandescent Lamp and its Manufacture. 8vo, cloth.. . . . . 3 00



- 
- RANDALL (J. E.).** A Practical Treatise on the Incandescent Lamp. Illustrated. 16mo, cloth..... 50
- RANDALL (P. M.).** Quartz Operator's Hand-book. New edition, revised and enlarged, fully illustrated. 12mo, cloth..... 2 00
- RANKINE (W. J. MACQUORN.)** Applied Mechanics. Comprising the Principles of Statics and Cinematics, and Theory of Structures, Mechanism, and Machines. With numerous diagrams. Fifteenth edition. Thoroughly revised by W. J. Millar. 8vo, cloth ... .. 5 00
- Civil Engineering. Comprising Engineering Surveys, Earthwork, Foundations, Masonry, Carpentry, Metal Work, Roads, Railways, Canals, Rivers, Water Works, Harbors, etc. With numerous tables and illustrations. Twentieth edition. Thoroughly revised by W. J. Millar. 8vo, cloth... .. 6 50
- Machinery and Millwork. Comprising the Geometry, Motions, Work, Strength, Construction, and Objects of Machines, etc. Illustrated with nearly 300 wood cuts. Seventh edition. Thoroughly revised by W. J. Millar. 8vo, cloth..... 5 00
- The Steam Engine and other Prime Movers. With diagram of the Mechanical Properties of Steam-folding plates, numerous tables and illustrations. Thirteenth edition. Thoroughly revised by W. J. Millar. 8vo, cloth .... . 5 00
- Useful Rules and Tables for Engineers and Others. With appendix, tables, tests, and formulæ for the use of Electrical Engineers. Comprising Submarine Electrical Engineering, Electric Lighting, and Transmission of Power. By Andrew Jamieson, C. E., F. R. S. E. Seventh edition. Thoroughly revised by W. J. Millar. Crown 8vo, cloth. .... 4 00
- A Mechanical Text-Book. By Prof. Macquorn Rankine and E. F. Bamber, C. E. With numerous illustrations. Fourth edition. 8vo, cloth..... 3 50
- RAPHAFL (F. C.).** Localisation of Faults in Electric Light Mains. 8vo, cloth..... 2 00
- RECKENZAUN (A.).** Electric Traction on Railways and Tramways. 213 illustrations. 12mo, cloth..... 4 00

- REED'S ENGINEERS' HAND-BOOK** to the Local Marine Board Examinations for Certificates of Competency as First and Second Class Engineers. By W. H. Thorn. With the answers to the Elementary Questions. Illustrated by 297 diagrams and 36 large plates. Sixteenth edition, revised and enlarged. 8vo, cloth..... 5 00
- **Key to the Sixteenth Edition of Reed's Engineer's Hand-book** to the Board of Trade Examinations for First and Second Class Engineers and containing the working of all the questions given in the examination papers By W. H. Thorn. 8vo, cloth ..... 3 00
- **Useful Hints to Sea-going Engineers, and How to Repair and Avoid "Break Downs;"** also Appendices Containing Boiler Explosions, Useful Formulæ, etc. With 36 diagrams and 4 plates. Second edition, revised and enlarged. 12mo, cloth..... 1 40
- **Marine Boilers: A Treatise on the Causes and Prevention of their Priming, with Remarks on their General Management.** Illustrated. 12mo, cloth... 2 00
- REINHARDT (CHAS. W.).** Lettering for Draftsmen, Engineers and Students. A Practical System of Free-hand Lettering for Working Drawings. Fourth thousand. Oblong, boards..... 1 00
- RICE (J. M.), and JOHNSON, W. W.** On a New Method of obtaining the Differential of Functions, with especial reference to the Newtonian Conception of Rates or Velocities. 12mo, paper.... 50
- RINGWALT (J. L.).** Development of Transportation Systems in the United States, Comprising a Comprehensive Description of the leading features of advancement from the colonial era to the present time. With illustrations. Quarto, half morocco.. 7 50
- RIPPER (WILLIAM).** A Course of Instruction in Machine Drawing and Design for Technical Schools and Engineer Students. With 52 plates and numerous explanatory engravings. Folio, cloth..... 6 00
- ROEBLING (J. A.).** Long and Short Span Railway Bridges. Illustrated with large copperplate engravings of plans and views. Imperial folio, cloth ..... 25 00

- ROGERS (Prof. H. D.).** The Geology of Pennsylvania. A Government Survey, with a General View of the Geology of the United States, essays on the Coal Formation and its Fossils, and a description of the Coal Fields of North America and Great Britain. Illustrated with plates and engravings in the text. 3 vols., 4to, cloth, with portfolio of maps. 15 00
- ROSE (JOSHUA, M. E.).** The Pattern-Makers' Assistant. Embracing Lathe Work, Branch Work, Core Work, Sweep Work, and Practical Gear Constructions, the Preparation and Use of Tools, together with a large collection of useful and valuable Tables. Eighteenth edition. Illustrated with 250 engravings. 8vo, cloth..... 2 50
- Key to Engines and Engine-running. A Practical Treatise upon the Management of Steam Engines and Boilers for the Use of Those who Desire to Pass an Examination to Take Charge of an Engine or Boiler. With numerous illustrations, and Instructions Upon Engineers' Calculations, Indicators, Diagrams, Engine Adjustments, and other Valuable Information necessary for Engineers and Firemen. 12mo, cloth..... 2 50
- SABINE (ROBERT).** History and Progress of the Electric Telegraph. With descriptions of some of the apparatus. Second edition, with additions. 12mo, cloth.... 1 25
- SAELTZER (ALEX.).** Treatise on Acoustics in connection with Ventilation. 12mo, cloth..... 1 00
- SALOMONS (Sir DAVID, M. A.).** Electric Light Installations. A Practical Hand-book. Eighth edition, revised and enlarged, with numerous illustrations. Vol. I. The management of Accumulators. 12mo, cloth.... 1 50  
Vol. II., Apparatus, 296 illustrations. 12mo, cloth 2 25  
Vol. III., Applications. 12mo, cloth.... 1 50
- SANFORD (P. GERALD).** Nitro-Explosives. A Practical Treatise concerning the Properties, Manufacture and Analysis of Nitrated Substances, including the Fulminates, Smokeless Powders and Celluloid. 8vo, cloth, 270 pages..... 3 00
- SAUNNIER (CLAUDIUS).** Watchmaker's Hand-book. A Workshop Companion for those engaged

- in Watchmaking and allied Mechanical Arts. Translated by J. Trippin and E. Rigg. Second edition, revised with appendix. 12mo, cloth ..... 3 50
- SCHELLEN (Dr. H.).** Magneto-Electric and Dynamo-Electric Machines: their Construction and Practical Application to Electric Lighting, and the Transmission of Power. Translated from the third German edition, by N. S. Keith and Percy Neymann, Ph. D. With very large additions and notes relating to American Machines, by N. S. Keith. Vol. I., with 353 illustrations. Second edition ..... 5 00
- SCHUMANN (F.).** A Manual of Heating and Ventilation in its Practical Application, for the use of Engineers and Architects. Embracing a series of Tables and Formulæ for dimensions of heating, flow and return pipes for steam and hot water boilers, flues, etc. 12mo, illustrated, full roan. .... 1 50
- SCRIBNER (J. M.).** Engineers' and Mechanics' Companion. Comprising United States Weights and Measures. Mensuration of Superfices and Solids, Tables of Squares and Cubes, Square and Cube Roots, Circumference and Areas of Circles, the Mechanical Powers, Centres of Gravity, Gravitation of Bodies, Pendulums, Specific Gravity of Bodies, Strength, Weight, and Crush of Materials, Water-Wheels, Hydrostatics, Hydraulics, Statics, Centres of Percussion and Gyration, Friction Heat, Tables of the Weight of Metals, Scantling, etc., Steam and the Steam Engine. Twentieth edition revised. 16mo, full morocco ..... 1 50
- SEATON (A. E.).** A Manual of Marine Engineering. Comprising the Designing, Construction and Working of Marine Machinery. With numerous tables and illustrations reduced from Working Drawings. Fourteenth edition. Revised throughout, with an additional chapter on Water Tube Boilers. 8vo., cloth ..... 6 00
- and **ROUNTHWAITE (H. M.).** A Pocket-book of Marine Engineering Rules and Tables. For the use of Marine Engineers and Naval Architects, Designers, Draughtsmen, Superintendents, and all engaged in the design and construction of Marine Machinery, Naval and Mercantile. Fifth edition, revised and enlarged. Pocket size. Leather, with diagrams. Reprinting.

- SEXTON (A. HUMBOLDT).** Fuel and Refractory Materials. 8vo, cloth..... 2 00
- SHIELDS (J. E.).** Notes on Engineering Construction Embracing Discussions of the Principles involved, and Descriptions of the Material employed in Tunnelling, Bridging, Canal and Road Building, etc. 12mo, cloth..... 1 50
- SHOCK (WM. H.).** Steam Boilers: Their Design, Construction and Management. 4to, half morocco. 15 06
- SHREVE (S. H.).** A Treatise on the Strength of Bridges and Roofs. Comprising the determination of Algebraic formulas for strains in Horizontal, Inclined or Rafter, Triangular, Bowstring, Lenticular, and other Trusses, from fixed and moving loads, with practical applications and examples, for the use of Students and Engineers. 87 woodcut illus. Fourth edition. 8vo, cloth..... 3 50
- SHUNK (W. F.).** The Field Engineer. A Handy Book of practice in the Survey, Location, and Truck-work of Railroads, containing a large collection of Rules and Tables, original and selected, applicable to both the Standard and Narrow Gauge, and prepared with special reference to the wants of the young Engineer. Eleventh edition, revised and enlarged. 12mo, morocco, tucks..... 2 50
- SIMMS (F. W.).** A Treatise on the Principles and Practice of Levelling. Showing its application to purposes of Railway Engineering, and the Construction of Roads, etc. Revised and corrected, with the addition of Mr. Laws' Practical Examples for setting out Railway Curves. Illustrated. 8vo, cloth..... 2 50
- SIMMS (W. F.).** Practical Tunnelling. Fourth edition, revised and greatly extended. With additional chapters illustrating recent practice by D. Kinnear Clark. With 36 plates and other illustrations. Imperial 8vo, cloth..... 12 00
- SLATER (J. W.).** Sewage Treatment, Purification, and Utilization. A Practical Manual for the Use of Corporations, Local Boards, Medical Officers of Health, Inspectors of Nuisances, Chemists, Manufacturers, Riparian Owners, Engineers, and Rate-payers. 12mo, cloth..... 2 25

- SMITH (ISAAC W., C. E.).** The Theory of Deflections and of Latitudes and Departures. With special applications to Curvilinear Surveys, for Alignments of Railway Tracks. Illustrated. 16mo, morocco, tucks. . . . . 3 00
- SNELL (ALBION T.).** Electric Motive Power: The Transmission and Distribution of Electric Power by Continuous and Alternate Currents With a Section on the Applications of Electricity to Mining Work. Second edition. 8vo, cloth, illustrated. . . . . 4 00
- SPEYERS (CLARENCE L.).** Text-Book of Physical Chemistry. 8vo, cloth. . . . . 2 25
- STAHL (A. W.), and A. T. WOODS.** Elementary Mechanism. A Text-Book for Students of Mechanical Engineering. Fourth edition, enlarged. 12mo, cloth. . . . . 2 00
- STALEY (CADY), and PIERSON, GEO. S.** The Separate System of Sewerage: its Theory and Construction. Third edition, revised. 8vo, cloth. With maps, plates and illustrations. . . . . 3 00
- STEVENSON (DAVID, F.R.S.N.).** The Principles and Practice of Canal and River Engineering. Revised by his sons David Alan Stevenson, B. Sc., F. R. S.E., and Charles Alexander Stevenson, B. Sc., F. R. S.E., Civil Engineer. Third edition, with 17 plates, 8vo, cloth. . . . . 10 00
- The Design and Construction of Harbors, A Treatise on Maritime Engineering. Third edition with 24 plates, 8vo, cloth. . . . . 9 00
- STEWART (R. W.).** A Text Book of Light, Adapted to the Requirements of the Intermediate Science and Preliminary Scientific Examinations of the University of London, and also for General Use, Numerous Diagrams and Examples. 12mo, cloth. . . . . 1 00
- STEWART (R. W.).** A Text Book of Heat, Illustrated, 8vo, cloth. . . . . 1 00
- A Text Book of Magnetism and Electricity, 160 Illus. and Numerous Examples. 12mo, cloth. . . . . 1 00
- STILES (AMOS).** Tables for Field Engineers. Designed for use in the field. Tables containing all the functions of a one degree curve, from which a corresponding one can be found for any required

- degree. Also, Tables of Natural Sines and Tangents. 12mo, morocco, tucks..... 2 00
- STILLMAN (PAUL).** Steam Engine Indicator and the Improved Manometer Steam and Vacuum Gauges; their Utility and Application. New edition. 12mo, flexible cloth. .... 1 00
- STONE (General ROY).** New Roads and Road Laws in the United States. 200 pages, with numerous illustrations. 12mo, cloth..... 1 00
- STUART (C. B., U. S. N.).** Lives and Works of Civil and Military Engineers of America. With 10 steel-plate engravings. 8vo, cloth..... 5 00
- The Naval Dry Docks of the United States. Illustrated with 24 fine Engravings on Steel. Fourth edition. 4to, cloth... .. 6 00
- SWINTON (ALAN A. CAMPBELL).** The Elementary Principle of Electric Lighting. Illustrated. 12mo, cloth ..... 60
- TEMPLETON (WM.).** The Practical Mechanic's Work-shop Companion. Comprising a great variety of the most useful rules and formulæ in Mechanical Science, with numerous tables of practical data and calculated results facilitating mechanical operations. Revised and enlarged by W. S. Hutton. 12mo, morocco... .. 2 00
- THOM (CHAS.), and WILLIS H. JONES.** Telegraphic Connections: embracing Recent Methods in Quadruplex Telegraphy. Oblong, 8vo, cloth. 20 full page plates, some colored..... 1 50
- THOMPSON (EDWARD P., M. E.).** How to Make Inventions; or Inventing as a Science and an Art. A Practical Guide for Inventors. Second edition. 8vo, boards ..... 1 00
- Roentgen Rays and Phenomena of the Anode and Cathode Principles, Applications and Theories. For Students, Teachers, Physicians, Photographers, Electricians and others. Assisted by Louis M. Pignolet, N. D. C. Hodges, and Ludwig Gutmann, E. E. With a Chapter on Generalizations, Arguments, Theories, Kindred Radiations and Phenomena. By Professor Wm. Anthony. 8vo, cloth. 50 Diagrams, 40 Half tones..... 1 50





- URQUHART, (J. W.).** Dynamo Construction: a Practical Hand book for the Use of Engineer Constructors and Electricians in Charge, embracing Frame Work Building, Field Magnet and Armature Winding and Grouping, Compounding, etc., with Examples of Leading English, American and Continental Dynamos and Motors, with numerous illustrations. 12mo, cloth ..... 3 00
- Electric Ship Lighting. A Hand-book on the Practical Fitting and Running of Ship's Electrical Plant. For the Use of Ship Owners and Builders, Marine Electricians and Sea Going Engineers-in-Charge. Numerous illustrations. 12mo, cloth .... 3 00
- UNIVERSAL TELEGRAPH CIPHER CODE.**  
Arranged for General Correspondence. 12mo, cloth. 1 00
- VAN NOSTRAND'S ENGINEERING MAGAZINE.** Complete sets, 1869 to 1886 inclusive.  
Complete sets, 35 vols., in cloth .. ..... 60 00  
Complete sets, 35 vols., in half morocco ..... 100 00
- VAN WAGENEN (T. F.).** Manual of Hydraulic Mining. For the Use of the Practical Miner. Revised and enlarged edition. 18mo, cloth ..... 1 00
- WALKER (SIDNEY F.).** Electric Lighting for Marine Engineers, or How to Light a Ship by the Electric Light and How to Keep the Apparatus in Order. 103 illustrations. 8vo, cloth. Second edition. 2 00
- WALLIS-TAYLER (A. J.).** Modern Cycles. A Practical Hand-book on their Construction and Repair. With 300 illustrations. 8vo, cloth ..... 4 00
- Motor Cars, or Power Carriages for Common Roads. 8vo, cloth, with numerous illustrations. .. 1 80
- Bearings and Lubrication. A Hand book for every user of Machinery. 8vo, cloth, fully illustrated ..... 1 50
- Refrigerating and Ice-Making Machinery. A Descriptive Treatise for the use of persons employing refrigerating and ice-making installations and others. 8vo, cloth. Illustrated ..... 3 00
- Sugar Machinery. A Descriptive Treatise, Devoted to the Machinery and Apparatus used in the Manufacture of Cane and Beet Sugars. 12mo, cloth. Illustrated . ..... 2 00

- WANKLYN (J. A.).** A Practical Treatise on the Examination of Milk and its Derivatives, Cream, Butter, and Cheese. 12mo, cloth..... 1 00
- Water Analysis. A Practical Treatise on the Examination of Potable Water. Tenth Edition. 12mo, cloth..... 2 00
- WANSBROUGH (WM. D.).** The A. B. C. of the Differential Calculus. 12mo, cloth.... 1 50
- WARD (J. H.).** Steam for the Million. A Popular Treatise on Steam, and its application to the Useful Arts, especially to Navigation. 8vo, cloth..... 1 00
- WARING (GEO. E., Jr.).** Sewerage and Land Drainage. Illustrated with wood-cuts in the text, and full-page and folding plates Quarto. Cloth. Third edition..... 6 00
- Modern Methods of Sewage Disposal for Towns, Public Institutions and Isolated Houses. Second edition, revised and enlarged. 260 pages. Illustrated. Cloth..... 2 00
- How to Drain a House. Practical Information for Householders. New and enlarged edition. 12mo, cloth..... 1 25
- WATSON (E. P.).** Small Engines and Boilers. A Manual of Concise and Specific Directions for the Construction of Small Steam Engines and Boilers of Modern Types from five Horse-power down to model sizes. 12mo, cloth. Illustrated with Numerous Diagrams and Half Tone Cuts. New York, 1899..... 1 25
- WATT (ALEXANDER).** Electro-Deposition, A Practical Treatise on the Electrolysis of Gold, Silver, Copper, Nickel, and other Metals, with Descriptions of Voltaic Batteries, Magneto and Dynamo-Electric Machines, Thermopiles, and of the Materials and Processes used in every Department of the Art, and several chapters on Electro-Metallurgy With numerous illustrations. Third edition, revised and corrected. Crown, 8vo, 568 pages..... 3 50
- Electro-Metallurgy Practically Treated. Tenth edition, considerably enlarged. 12mo, cloth..... 1 00
- The Art of Soap-Making. A Practical Hand-book of the Manufacture of Hard and Soft Soaps, Toilet Soaps, &c. Including many New Processes, and a Chapter on the Recovery of Glycerine from Waste Leys. With illustrations. Fourth edition, revised and enlarged. 8vo..... 3 00

- WATT (ALEXANDER).** The Art of Leather Manufacture. Being a Practical Hand-book, in which the Operations of Tanning, Currying, and Leather Dressing are Fully Described, and the Principles of Tanning Explained, and many Recent Processes Introduced. With numerous illustrations. Second edition. 8vo, cloth .... 4 00
- WEALE (JOHN).** A Dictionary of Terms Used in Architecture, Building, Engineering, Mining, Metallurgy. Archaeology, the Fine Arts etc., with explanatory observations connected with applied Science and Art. Fifth edition, revised and corrected. 12mo, cloth ..... 2 50
- Weale's Rudimentary Scientific Series (Catalogue sent on application).
- WEBB (HERBERT LAWS).** A Practical Guide to the Testing of Insulated Wires and Cables. Illustrated. 12mo, cloth..... 1 00
- The Telephone Hand-book. 128 illustrations. 146 pages. 16mo, cloth..... 1 00
- WEEKES (R. W.).** The Design of Alternate Current Transformers. Illustrated. 12mo, cloth..... 1 00
- WEISBACH (JULIUS).** A Manual of Theoretical Mechanics. Ninth American edition. Translated from the fourth augmented and improved German edition, with an Introduction to the Calculus by Eckley B. Coxe, A. M., Mining Engineer. 1,100 pages, and 902 wood-cut illustrations. 8vo, cloth .. 6 00  
Sheep ..... 7 50
- WESTON (EDMUND B.).** Tables Showing Loss of Head Due to Friction of Water in Pipes. Second edition. 12mo, cloth..... 1 50
- WEYMOUTH (F. MARTEN).** Drum Armatures and Commutators. (Theory and Practice.) A complete Treatise on the Theory and Construction of Drum Winding, and of commutators for closed-coil armatures, together with a full resume of some of the principal points involved in their design, and an exposition of armature re-actions and sparking. 8vo, cloth..... 3 00
- WEYRAUCH (J. J.).** Strength and calculations of Dimensions of Iron and Steel Construction, with reference to the Latest Experiments. 12mo, cloth, plates ..... 1 00

- WHEELER (Prof. J. B.).** Art of War. A Course of Instruction in the Elements of the Art and Science of War, for the Use of the Cadets of the United States Military Academy, West Point, N. Y. 12mo, cloth . . . . . 1 75
- Field Fortifications. The Elements of Field Fortifications, for the Use of the Cadets of the United States Military Academy, West Point, N. Y. 12mo. 1 75
- WHIPPLE (S., C. E.).** An Elementary and Practical Treatise on Bridge Building. 8vo, cloth . . . . . 3 00
- WILKINSON (H. D.).** Submarine Cable-Laying, Repairing and Testing. 8vo, cloth . . . . . 4 00
- WILLIAMSON (R. S.).** On the Use of the Barometer on Surveys and Reconnoissances. Part I. Meteorology in its Connection with Hypsometry. Part II. Barometric Hypsometry. With illustrative tables and engravings, 4to, cloth . . . . . 15 00
- WILLIAMSON (E. S.).** Practical Tables in Meteorology and Hypsometry, in connection with the use of the Barometer. 4to, cloth . . . . . 2 50
- WILSON (GEO.).** Inorganic Chemistry, with New Notation. Revised and enlarged by H. G. Madan. New edition. 12mo, cloth . . . . . 2 00
- WOODBURY (D. V.).** Treatise on the Various Elements of Stability in the Well-Proportioned Arch. 8vo, half morocco . . . . . 4 00
- WRIGHT (T. W.).** A Treatise on the Adjustment of Observations. With applications to Geodetic Work, and other Measures of Precision. 8vo, cloth . . . . . 4 00
- Elements of Mechanics; including Kinematics, Kinetics and Statics. With application. 8vo, cloth . . . . . 2 50
- WYLIE (CLAUDE).** Iron and Steel Founding. Illustrated with 39 diagrams. Second edition, revised and enlarged. 8vo, cloth . . . . . 2 00
- WYNKOOP (RICHARD).** Vessels and Voyages, as Regulated by Federal Statutes and Treasury Instructions and Decisions. 8vo, cloth . . . . . 2 00
- YOUNG (J. ELTON).** Electrical Testing for Telegraph Engineers, with Appendices consisting of Tables. 8vo, cloth. Illustrated . . . . . 4 00
- YOUNG SEAMAN'S MANUAL.** Compiled from Various Authorities, and Illustrated with Numerous Original and Select Designs, for the Use of the United States Training Ships and the Marine Schools. 8vo, half roan . . . . . 3 00



10/10  
30

2

THIS BOOK IS DUE ON THE LAST DATE  
STAMPED BELOW

AN INITIAL FINE OF 25 CENTS  
WILL BE ASSESSED FOR FAILURE TO RETURN  
THIS BOOK ON THE DATE DUE. THE PENALTY  
WILL INCREASE TO 50 CENTS ON THE FOURTH  
DAY AND TO \$1.00 ON THE SEVENTH DAY  
OVERDUE.

OCT 20 1955

ICLF (N)

SEP 8 4 49 58

DEC 18 1965 20

REC'D

DEC 2 - '65 - 12 PM

LOAN DEPT.

NOV 16 1967 56

REC'D

NOV 2 '67 - 1 AM

LOAN DEPT.

JAN 15 1976

REC'D AH/C

DEC 18 1975

YA 02155

TS725  
C7

142674

Collins

