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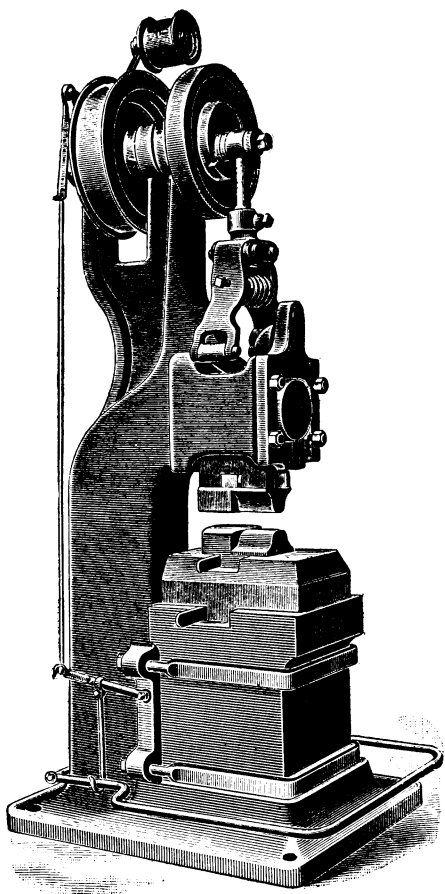
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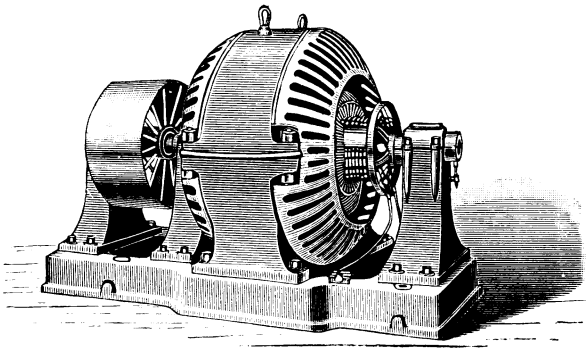
THE

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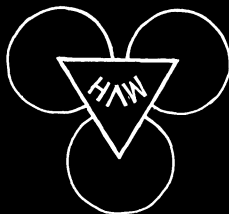




THE  
ADVANCED  
MACHINIST

A PRACTICAL AND EDUCATIONAL  
TREATISE, WITH ILLUSTRATIONS

BY  
WILLIAM ROGERS



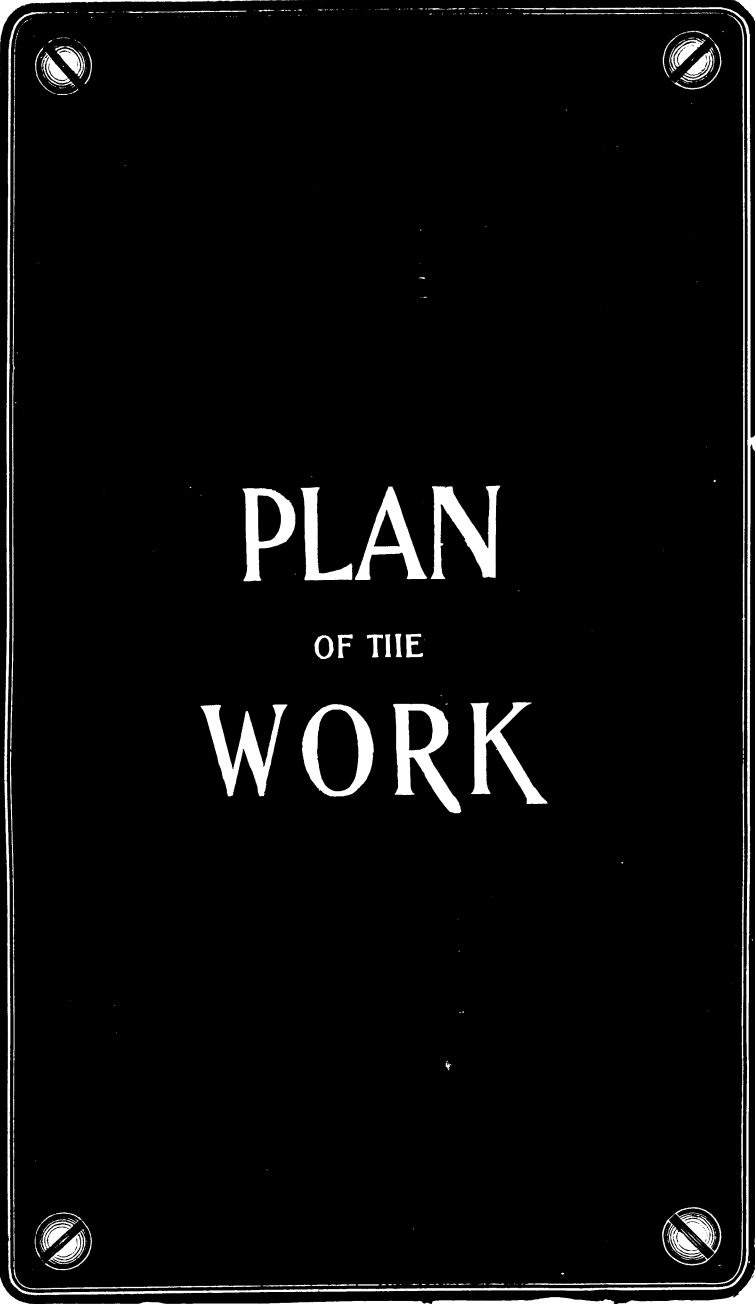
THEO. AUDEL & COMPANY

63 FIFTH AVENUE NEW YORK CITY.

1903

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PLAN  
OF THE  
WORK

*The difference between an engineer and a machinist is one of degree only—hence a book written for the benefit of engineers is of service to machinists; and, again, a book devoted to the interests of machinists is of the utmost value to engineers.*

*Why? Because the machinery which the engineer operates is made in the shop.*

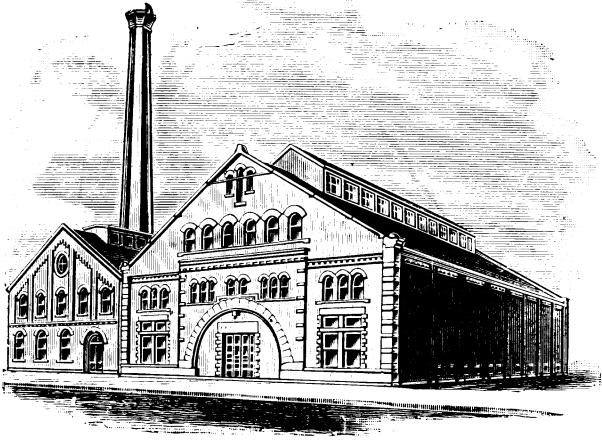
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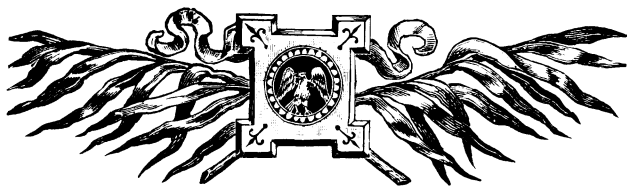
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## PREFACE.

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In a certain high-class journal of a recent date, devoted to the interests of the class for whom this book of instruction is designed, there appeared under the heading "Help Wanted," thirty-two paid advertisements in a single issue.

Not a single one of these called for any except those possessing qualifications expressed as follows :

"Sober," "first-class," "good," "competent," "accurate," "experienced," "undoubted ability," "ambitious," "able to handle men," "skilled," "with shop experience," "executive ability," "all-around," "able to design," "able to supervise construction," "satisfactory men."

The closest scrutiny fails to discover a wish for the opposite of those thus described, nor in the eleven paid advertisements under the heading of "Situations Wanted," in the same paper, does there appear even one saying "I am a second-class man—hire me," as that would be money thrown away. Hence, the only call is for the kind of men classified as in the foregoing quoted words.

Now, examining the list again, we find what these men are specially desired to perform—the range of service needed is wide, but interesting enough to study. All are described under the letters “ Help Wanted ”:

“ A good die-maker on round work.”—“ Accurate machinist for marine-engine work.”—“ Draftsman experienced on steam pumps.”—“ First-class designer on cotton machinery.”—“ First-class machinists for heavy floor and machine work.”—“ First-class toolmakers, experienced on jigs, punch and die work.”—“ Experienced mechanical draftsman for detail work on engines.”—“ Four first class machinists, those familiar with oil-well tool work.”—“ A machine-tool inspector, of undoubted ability.”—“ Mechanical draftsman having experience on large vertical Corliss-engine work.”—“ A large Chicago factory desires to employ a man experienced at fixing differential piece-work rates.”—“ A number of mechanical draftsmen on iron-and-steel-work machinery.”—“ Mechanic wanted, one accustomed to rolling-mill work.”—“ Foreman to take charge of machine shop employing about fifteen men.”—“ We invite application from pattern-makers, molders and machinists.”—“ Wanted, superintendent for small shop in Brooklyn, N. Y.”—“ Man experienced in light machinery, able to design, draft and supervise construction of special tools, jigs, etc., with shop experience, executive ability and some knowledge of cost and piece-work accounts.”—“ A New York factory contemplating additions to their drafting force desires applications from experienced draftsmen and tracers for electrical switchboard and instrument work.”—“ A thoroughly competent mechanical engineer, to take charge of drafting-room of a concern manufacturing a full line of mining machinery, except steam engines and boilers.”—“ Foreman for a brass department containing 50 hands, in a large electrical factory ; must be familiar with parts of electrical apparatus and with modern methods of production, and know the entire details of the workings of such a department.”—“ Three first-class floor men, as gang foremen, to take charge of machine shop operating several hundred men. Steady employment for competent men.”

Men possessing the qualifications described above may well be classed as “ advanced ” machinists, designers, draughtsmen and engineers ; it is the glory of the age that there are many such to be found ; these descriptions are

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quoted to plainly tell what kind of talent is desired, and—

This is the call for men in but a single issue of one periodical; there are many other journals containing similar "wants"; again, scores of mighty war ships are "lying in port" because competent machinists and engineers cannot be found to man them; and, still again, every great engine and every intricate machine makes place for a good man to operate it; in fact, the openings for clever, ingenious, trusty men, are world-wide.

It will be noted that the demand is for men possessing certain qualities most difficult to define and hard indeed to acquire; there must, perforce, be second-class men, to fill the ranks, for all cannot be "Captains of Industry"; but this book is not for them, unless it be to inspire thought and ambition to do better.

A few quotations may be helpful, indicating the path of advancement:

"Just do a thing and don't talk about it. This is the great secret in all enterprises."—"Modest confidence in his own abilities is one of the most pleasing traits a man can possess, and it is often his best business capital. I know many a young man with the right kind of stuff in him, who has watched the operations of other people and has said, 'I can do it *if they can.*' Then, with all the judgment he possessed, he made the effort successfully."—"It is easy to do what one is absolute master of. Indeed, this absolute mastery commands the fighting-deck of any trade, profession or labor, and to be best in anything honorable is to be secure of continual success."—"The man who undertakes to learn his business from books will never make a practical mechanic, but, on the other hand, the mechanic who refuses to read whatever he finds of interest on the subject can hardly expect to be successful."—"There are two ways of doing work. One may go about

it with a clouded brow, a lagging step, and a general expression of disgust and weariness ; or it is possible to be alert, energetic, bright of countenance and elastic of step, as if the labor were really enjoyable. The work is done in either case, of course, but there is something in the latter manner that inspires confidence in the worker and assures him of a reward that would not crown his efforts were they put forth in the other way."—"The best rule for success in life that I have ever found is to do a little more than is expected of you. Whatever your position in life may be, whether in an office, store, or workshop, do a little more than is expected of you, and you will never be overlooked, be the establishment large or small."—"The word 'tact' is equivalent to the word 'touch'; tact is that nice perception which comprehends everything of the order, formation, location and disposition of aught which bears upon the successful issue of the enterprise at issue. The man of tact who has that presence of mind which can bring him on the instant all he knows, is worth for action a dozen men who know as much, but can only bring it to light slowly."—"The young fellow who will distance his competitors is he who masters his business ; who preserves his integrity, who lives cleanly and purely, who never gets into debt, who gains friends by deserving them, and puts his money into the savings bank. There are some roads to fortune that look shorter than this old dusty highway. But the staunch men of the community, the men who achieve something really worth having, good fortune, good name and a serene old age, all go this road."—"Our present generation of coming men, youths of from fifteen to eighteen, can have not the least ground for fearing the temper and promise of the times into which their lives are going. Never before in the world's history has there been such a call from the near future to a rising army of eager workers. Science has probed the secrets of things, and the practical application of knowledge to all the lines of labor has lifted even menial services to a place of dignity, provided always that the operator is master of what he takes into hand."

In short, the preparation and issue of this work is aimed to point the way of advancement to those who must become fitted to assume the obligations, as well as to receive the rewards of those who, in the order of things, must give place to the coming-man.



But! this is not all—

The trade of the machinist is peculiar in that it is a preparation for so many positions outside of it. It takes a man of good natural ability and of considerable education—not always from books—to make a first-class machinist, and more of the same to make a competent foreman or a superintendent; so that when he is well qualified for these positions he is also well prepared for so many other openings with which the machine shop apparently has little to do; and many of these keep calling him, and many respond to the call, hence in consequence it is said that skill is dying out, that skilled workers are becoming scarce, that soon, as things are going, we will be left behind, in the world's markets, by the lack of both competent operatives and of the higher skill and reliability that are to exercise supervision and direction.

It is with a full knowledge of this fact, that in “The Plan of the Work” some subject matter has been introduced which the author is confident will be of the utmost value in the shop and afterwards as well, when the student “makes a change;” for in the fluctuation of business there come times when everybody is busy and then times that are slack and not so booming, when foremen and superintendents have that toughest of all jobs, the telling of good men that there is nothing for them to do; this being incident, also, to the kind of country we live in.

There is a bit of a necessary warning, too, in a little fable the author has seen, from *Æsop's Fables* (Revised)—

“A man had a Glass in which he looked at himself every day. And he did not perceive that he grew older. But at length he perceived that the Glass had grown old.

So he threw it away and got another that was new. Then he saw that he had grown old with his Glass.”

Every man looks in a glass at times and afterwards does some rather serious thinking ; it is to aid the friendly reader and student in such moments to right thoughts that some things, too, have been put in the book in odd spaces, with the hope that the good will with which it has been done will not be taken amiss.

The path of advancement, how uncertain is it and at times so difficult to discern amid the shadows. The mere mention of this allows the quotation of a wise leader of men, that may well be the author’s closing words for the volume.

“ Look up and press forward and the way will become clear step by step, day by day ; the space between is the way thither.”