

**SPEED CONTROL OF  
INDUCTION MOTORS FOR  
ROLLING MILL SERVICE;  
BACHELOR'S THESIS**

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Speed Control of Induction Motors for Rolling Mill Service; Bachelor's Thesis by Jerome Henry Gefke

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**JEROME HENRY GEFKE**

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SPEED CONTROL OF INDUCTION MOTORS  
FOR  
ROLLING MILL SERVICE

By  
JEROME HENRY GEFKE

A Thesis Submitted for the Degree of  
BACHELOR OF SCIENCE  
Electrical Engineering Course

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1917



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## INTRODUCTION

The time has gone by when it was necessary to discuss the advantages of the induction motor for rolling mill service. Time and experience have long since proved these beyond reasonable doubt. Nevertheless, there are a great many problems concerned with its application which are not yet fully solved. One of these is concerned with the provision of suitable and adequate speed control. Owing to the fact that this type of motor is inherently a constant speed machine it is not readily adapted to multispeed service, and for this reason its field of application has been restricted to that of constant speed work. In spite of the short-comings of the induction motor in this respect it still possesses many of the features and characteristics so desirable for rolling mill drive; and for this reason renewed effort has been made on the part of engineers during recent years to make up its deficiency and thus further its scope of application. Not only has the subject of multispeed control for induction motors been more or less constantly agitated thru the technical press and discussed with more or less detail at the meetings of the various industrial societies, but a vast amount of valuable data and information has been obtained as a result of many elaborate and costly experiments carried on in conjunction with actual rolling mill practice. Out of these discussions and experiments have evolved a great many schemes, each a compromise, to further the solution of the adjustable speed problem. Altho many of these arrangements



have certain objectionable features which have precluded their general adoption for practical use, yet the importance attached to many of them, especially to the more recent ones, is only indicated by the almost promiscuous use to which the induction motor has been placed during recent years.

Because of the growing importance of the subject dealing with the general control of the induction motor for multispeed work and in view of the absence of material in available form on this subject there is a need for the collection and arrangement of such material. To fill this end the work of this thesis was undertaken.

It shall be the purpose of this thesis to unify and correlate, in as simple and untechnical manner as possible, the existing material dealing with the economical speed control of the induction motor as applied to rolling mill service. The plan of treatment in this discussion is, (1) to review briefly some of the methods most commonly used, not only in rolling mill work but in the allied industries as well, for controlling the speed of induction motors, (2) to discuss those speed regulating sets, both early and recent, which employ three-phase commutating regulating machines in conjunction with the main induction motor, and (3) to consider the essential features in the construction and operation of the standard arrangements used for automatically starting induction motors, both of the form-wound and squirrel-cage rotor type.