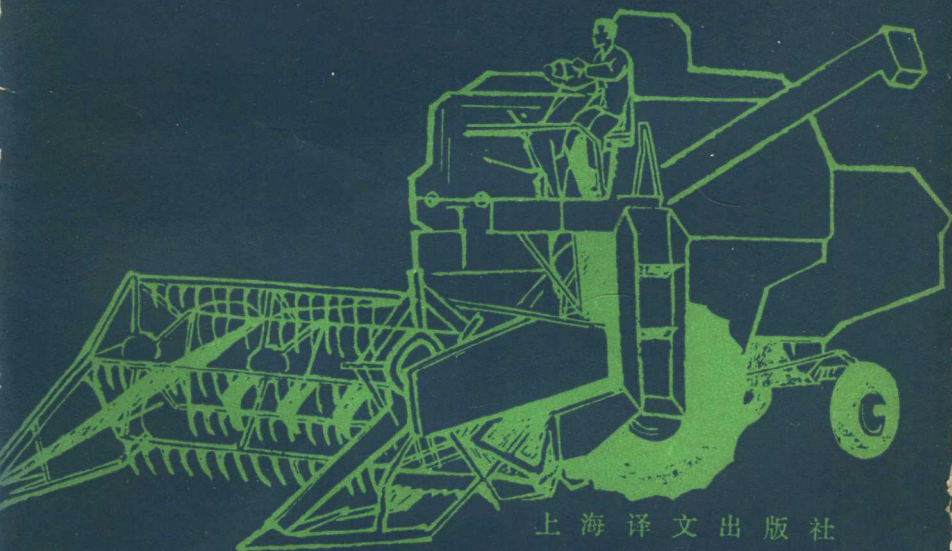


英语科普注释读物

HOW FARM MACHINERY WORKS

农机是怎样工作的



上海译文出版社

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上海师大外语系资料室注释

上海译文出版社出版

(上海延安中路 967 号)

新华书店上海发行所发行 上海中华印刷厂印刷

开本 787×1092 1/32 印张 2 字数 32,000
1978 年 6 月第 1 版 1978 年 6 月第 1 次印刷

书号: 9188·4 定价: 0.18 元

内部发行

注 释 者 的 话

本书选注的原文是英国人 David Carey 撰写的，简单介绍农业机械的部件及其操作原理。选自 How it Works 丛书之农业机械分册 (1970 年版)。

本书文字比较浅显，可供中、小学英语教师或具有英语基础知识的英语专业学生和有关专业的读者阅读。文中较难的习惯用法、句子结构和语法现象都以汉语即页注释或分析，以便读者借助注释，逐步提高对英语科技著作的阅读能力。

选注科普英语原著的工作，仅是初次尝试。作者的某些错误观点，希读者阅读时注意分析批判。注释中的缺点或错误，希读者批评指正。

上海师范大学外语系资料室

一九七七年七月

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How Farm Machinery Works

Introduction

The days have long since gone when the farm labourer was just a simple fellow, perhaps too uneducated or dull to do any other sort of work.¹ Over the years,² village folk have drifted away from the land and into towns where they have been absorbed into the industrial life of the community.³ As the industrial areas became bigger, more farm land was used for the creation of large housing estates, new factories and even satellite towns.⁴ Yet, with fewer workers and less land, farmers were expected to produce more food to feed the ever-growing population.⁵

1. 关系副词 when (= in which) 引起的定语从句修饰主句的主语 the days (日子, 时代). “too + 形容词或副词 + 不定式”表示“太……以致不……”. long since: 很久以来, 早已. 2. 这些年来, over 相当于 during (在……的期间) 和 through (从头到尾经过). 3. 那里工业的社会生活吸收着他们. 关系副词 where (= at which) 引起的定语从句修饰 towns. be absorbed into: 吸收到…… (这里指农业人口被吸收到工矿中去). 4. 卫星城 (大城市附近的郊区城镇). 5. 然而, 随着人员和土地的减少, 大家都期望农民能生产更多的食物来养活日益增长的人口. were expected to produce 是表示行为的复合谓语. 本句是被动语态, 其主动语态为 people expected farmers to produce.

Part of the problem of getting more from less land and less workers has been solved by the increasing use of farm machinery, *which* can be operated by fewer hands and *which*⁶ does the various jobs on the farm *much more quickly*.⁷ The modern farmer *has to be something of*⁸ a technician *as well as*⁹ an expert on the land. His job is *less arduous and a lot more interesting than it used to be*.¹⁰

Most types of farm machinery are produced by several manufacturers and therefore vary in details of design. In this book we describe the main kinds of machinery in general use and the principles on which they work. *It would not be possible to deal with all the differences between one make and another*.¹¹

6. *which ... which ...* 这两个关系代词的先行词都是 *farm machinery*.

7. 快得多. *much ad.* 很, 非常. 比较级前面加 *much* 含有加强语气的意思.

8. 在某种程度上必须是. *something of: to some extent, to some degree.*

9. 也, 又. 10. 比过去省力而又有趣得多. 连词 *than* 引起的比较状语从句修饰前面两个形容词的比较级. *a lot* 用作状语时相当于 *very much*. "*used (vi. 只用过去时) + 不定式*"表示"过去常常", "过去经常". 11. 论述一种式样和另一种式样之间的所有差别将会是不可能的. *It* 是形式主语, 不定式 *to deal with* 是真正的主语. 不用 *will* 而用 *would* 是表示委婉地(虚拟语气)提出自己的看法.

The Tractor

The tractor, more than any other piece of equipment, has made possible the introduction of many machines on the farm.¹² It is the farmer's maid-of-all-work,¹³ the one basic machine from which nearly all the others can be worked.¹⁴ It can tow a trailer laden with hay or animal feed and, by means of a power take-off,¹⁵ operate equipment pulled or carried behind it in the field or standing in the yard. Its special design enables it to travel over¹⁶ rough or soft ground so that there are very few occasions when it is not able to work.¹⁷

Many different types and sizes of tractors are in use today, depending on the type and size of farm and the particular jobs the machines are call-

12. 拖拉机较之其他任何机件更有可能使农场采用许多机器。more than意为“比……更”。本来是“名词+形容词”式的复合宾语“the introduction ... possible”。由于复合宾语的第一部分太长，所以把第二部分(形容词 possible)放在前面。13. 全能助手。这里用连字号“-”把 maid of all work (可作多种用途的人或用具)合成一个词。14. 能够开动几乎所有其他机器的，介词 from 表示动力的来源。15. 动力输出轴；传动轴，take-off 意为“输出”，“输出轴”。16. 使它(拖拉机)能驶过。it to travel 是复合宾语。17. 从而它不能耕作的场合是极少的。when 引起的定语从句修饰 occasions (参看注1)。

*ed upon to do.*¹⁸ However, the principles on which they work are the same and the descriptions which follow apply to all.¹⁹

All farm tractors manufactured today have diesel engines, and though they are more expensive to buy than those built with petrol and vaporising oil (paraffin) engines a few years ago, they *stand up better to* ²⁰ the rough, slogging work that tractors have to do.

Engine Governors

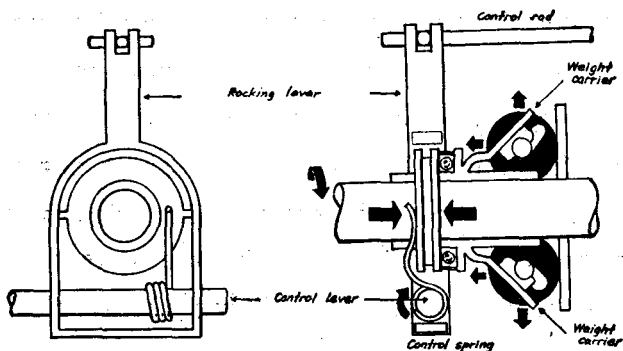
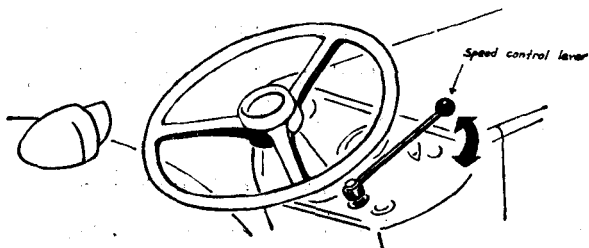
There is not space in this book to deal in detail with the construction and operation of tractor engines. Readers who are especially interested in this subject will find complete descriptions of the diesel engine in another book in this series, 'How it Works—The Locomotive'. The petrol engine is fully dealt with in 'How it Works—

18. 根据农场的类型、大小和要求拖拉机做的特定的工作而定。由 depending 引起的现在分词短语是状语，补充说明根据什么来采用各种不同的拖拉机。depend on: 依……而定。the machines are called upon to do 是省略了关系代词 that 的定语从句，are called upon to do 是表示行为的复合谓语（参看注 5）。19. 它们赖以操作的原理是同样的，下面的说明适用于一切（拖拉机）。20. 更能经受。stand up: 经得起（磨损等）。

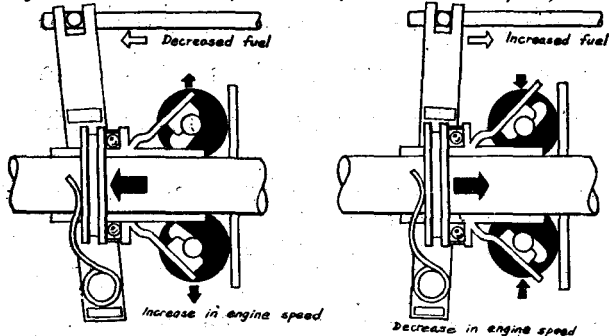
The Motor Car'. Paraffin engines work in a similar way to²¹ the petrol engine and, in fact, use petrol for starting purposes.²²

All tractor engines are fitted with a governor. Its purpose is to keep the engine running at an even speed²³ and so save the driver having to make throttle adjustments²⁴ every time there is a change of ground conditions.²⁵ For instance, when the tractor is pulling a plough it might go over a patch of soft earth. The plough cuts through it more easily. Without a governor the engine would speed up making the tractor go faster.²⁶ In hard ground the plough would meet with greater resistance, slowing down the engine and the tractor. By allowing less fuel into the engine over the easy portions of ground, and increasing the supply when the going is difficult,

21. 以和……同样的方法。 22. 为了起动的目的。 23. 使发动机保持以均匀的速度运转。 engine running 是复合宾语。 at... speed: 以……速度。 24. 使拖拉机手不必调节油门。 及物动词 save (省去, 避免) 后面可以接各种形式的宾语。本句的 the driver having... 相当于 the driver's having..., 也可用 save the driver from having...。 throttle ['θrɒtl] n. 风门, 油门。 25. 每逢地面情况变化时。 every time 后面是一个经常省去关系副词的定语从句。 26. 会加速运转而使拖拉机走得更快。 在这里 speed up 是不及物动词短语。 making... 是结果状语。 the tractor go faster 是复合宾语。在主动语态中, 作为动词 make 的复合宾语的第二部分的不定式前面没有 to。



The speed control lever winds up the control spring and the force exerted on the weight carrier is balanced by the centrifugal force exerted by the weights on the weight carrier, and the rocking lever holds the control rod in position necessary to deliver the correct quantity of fuel.



If the engine speed tends to increase or decrease, the centrifugal force of the weights will increase or decrease correspondingly. This change will cause the weight carrier to move and change the position of the control rod, thus decreasing or increasing the amount of fuel delivered, and maintaining engine speed at the predetermined setting.

the governor acts as an automatic throttle adjuster to keep the tractor running at a constant speed *whatever the state of the ground.*²⁷

Transmission, Wheels and Tracks

Power from the engine is transmitted to the big driving wheels of the tractor by means of the transmission system. This consists of the clutch, gearbox and rear-axle differential unit. *Briefly, the clutch allows the drive from the engine to the gearbox to be disconnected so that various gears can be engaged.*²⁸ The gearbox contains several pairs of gears, and by selecting certain combinations the driver can match the speed and pulling power of the tractor to the work it has to do.²⁹ *A slow speed with high engine revs. (low gear) is required for working farm implements in rough ground,*³⁰ while faster speeds with lower

27. 不管地面的情况怎样。这是一个省略了连系动词 may be (或 is) 的让步状语从句, 修饰 to keep. 连接代词 whatever 在句中做表语。28. 扼要地说, 离合器可以使从发动机到变速箱的传动分离, 从而能挂上各种不同的档位。副词 briefly 可以看作独立成分, 修饰整个句子, drive *n.* 驱动; 传动, gear *n.* (拖拉机, 汽车等的) 排挡。29. 拖拉机驾驶员能使拖拉机的速度和牵引力配合它所必须做的耕作。30. 在高低不平的土地上使用农机需要低速和高的发动机转数(低档), is required 是被动语态。(为通顺起见, 汉译改用主动式), revs. 是 revolutions (转数) 的简略形式, low gear (= low speed gear): 低档。

engine revs. (*high gear*)³¹ is needed for towing light trailers and generally *running about the farm*.³² Finally, the differential unit transmits the drive to the rear wheels and allows each wheel to rotate at different speeds so that the tractor can *turn corners*.³³

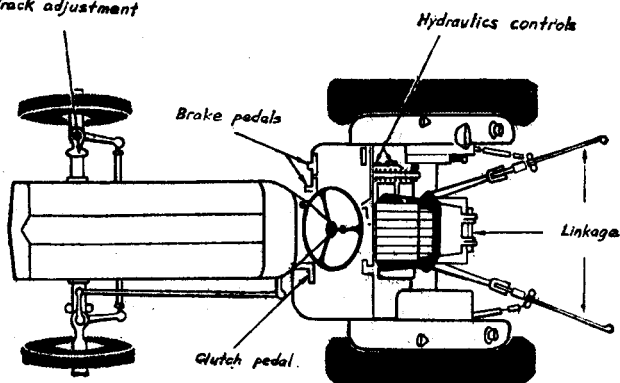
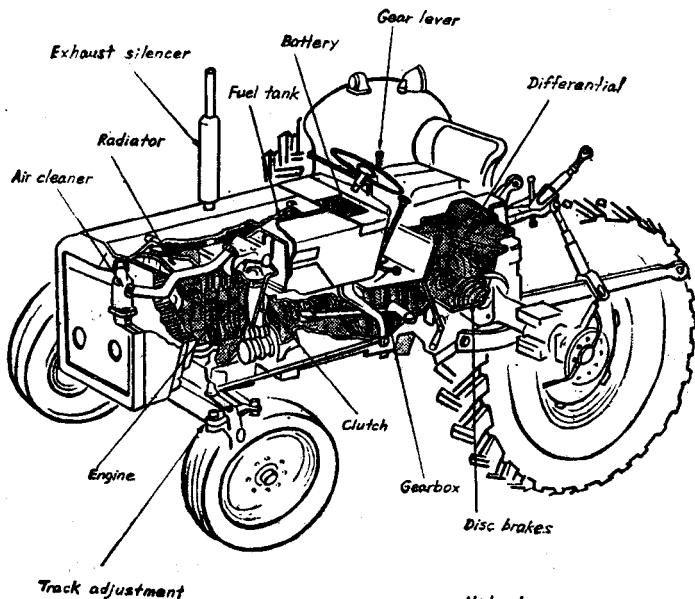
'A tractor's transmission system works on the same principles as that of a car',³⁴ and our more mechanically-minded readers will find full details of its operation in 'How it Works—The Motor Car'.

Because tractors have to work in crops sown in rows, the distance, or track, between the front and rear pairs of wheels can be widened or narrowed so that they run between the rows and not over the crops.

Wheel Grip

Although the big, heavily-treaded, rear tyres of the modern farm tractor can deal with most

31. high gear (= high speed gear): 高档。 32. 在田间转移。 running 和上文的 towing 并列，两者都是动名词，做介词 for 的宾语。 run about 原义是“在……上到处行驶”。 33. 转弯。 34. 根据和汽车传动系统(赖以操作的原理)相同的原理……。关系代词 as 所引起的定语从句可扩展为 as that of a car works on, that 指上文的 transmission system.



conditions, *there does come a time when the mud is too thick or the ground too slippery for them to get a grip.*³⁵ Farm work has to continue *whatever the ground conditions,*³⁶ so ways have been developed to overcome this problem.

1. *Adhesion, as the grip between tyre and ground is known, depends on weight,*³⁷ and extra weight can be provided by partly filling the tyres with water. A special attachment fitted *in place of*³⁸ the air valve allows the water to be pumped in through a hose.

2. Another method is to add weights to the front end of the tractor. The number of weights added depends on the state of the ground and the particular work the tractor is doing.

3. An arrangement of steel links can be fitted

35. 有时烂泥太厚或地面太滑以致轮胎抓附不牢地面, 这种时候肯定会碰到的。在用引导词 *there* 开头的句子中, 主语延迟出现, 以示强调。本句的主语是 *time*, 谓语是 *does come*。助动词 *does* 表示强调, *for them to get* 是不定式的一种复合结构, 在这里作结果状语。 *for* 没有词汇意义, *them* 是 *to get* 的逻辑上的主语。 36. 不管地面情况怎样。连接代词 *whatever* 引起一个让步状语从句, *whatever* 是这个从句的表语, 连系动词 *may be* 省略了 (参看注 27)。 37. 轮胎和地面之间的粘附作用称做附着力, 它取决于重量。连词 *as* 所引起的从句可以看作插入句。 *adhesion* [əd'hi:ʒən] *n.* 附着, 粘着; 附着力。 38. 代替。

around the tyres. These girdles, as they are called, help to give greater grip. *Half-tracks*³⁹ are used in some countries.

4. *Cage wheels* in the form of a metal framework fixed to the wheels will also help adhesion by taking up the drive as the tyres sink into the soft ground.⁴⁰

Power Take-off

Tractors were originally designed and produced to *take the place of*⁴¹ horses on the farm and, until recent years, were used most frequently as machines for towing. As the need for farm mechanization grew, a whole new range of machinery was developed and the tractor has now also become a source of auxiliary power *from which many other machines can be driven*,⁴² using a *Power Take-off device*,⁴³ or P.T.O.

39. 半链轨装置。 40. 在轮胎陷入松软的土地时, 笼式防陷轮会利用继续转动来增加附着力, help 在这里作 promote (促进; 引起) 解, take up (= resume): 继续做……。介词 by 表示“方法”、“手段”。 41. 代替。 42. 能够驱动其他许多机器的。这个定语从句修饰上文的 a source of auxiliary power (辅助动力的一个来源), from (参看注 14)。 43. 应用动力输出装置。这个分词短语是方式状语, 修饰上文的 can be driven, 相当于 by using ...