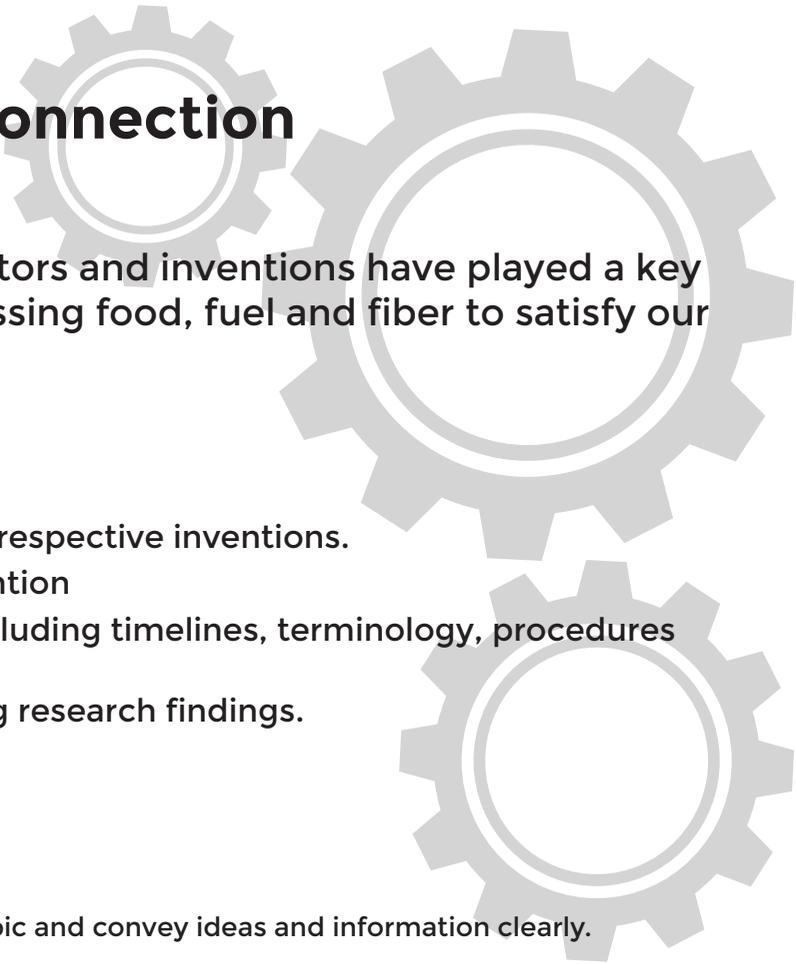


Agricultural Invention Connection



Throughout history, agricultural inventors and inventions have played a key role in growing, harvesting and processing food, fuel and fiber to satisfy our most basic human needs.

Grade Level: 5

Objectives:

- Identify agricultural inventors and their respective inventions.
- Examine one agricultural inventor/invention
 - Research this inventor/invention, including timelines, terminology, procedures and historical significance
 - Write an informative essay conveying research findings.

Educational Standards

Writing:

CCSS.ELA-LITERACY.W.5.2

Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Reading:

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

CCSS.ELA-LITERACY.RI.5.8

Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

CCSS.ELA-LITERACY.RI.5.9

Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-LITERACY.RI.5.10

By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.

Materials

- Book: *John Deere That's Who* by Tracy Nelson Maurer
- Photos sequences of agricultural inventions
- Classroom/student tablets or computer access
- Books and web-based resources for research
- Writing journals or paper/pencil for recording research
- Guided Research Worksheet
- Consider [Read Write Think](#) for additional pre-writing and writing resources

Engagement

Key Question:

What inventions play a key role in growing, harvesting and processing food, fuel and fiber to satisfy our most basic human needs?

Introduction:

Read *John Deere That's Who* by Tracy Nelson Maurer

Opening Activity:

Split students into groups of three or four. Give each group one set of agricultural invention cards. Ask students to order their cards, from oldest version of the invention to most recent model. First, allow students to try to make matches without an explanation of what each item is. After some time has passed, provide explanations of remaining or incorrectly matched items to assist in sequencing. Continue as time allows until either all are correct or students need further assistance. Reveal the correct order for each item along with explanations of each item's purpose or function.

Discussion Questions:

- Compare the earliest to most recent photo.
 - How has the object changed over time?
 - What has stayed the same or had minor changes?
- How would you revise the most current model moving forward to be more effective for farmers?
- Differentiate each state of the object. (2-3 observations each)

Procedures

1. Each student or a team of students will research one agricultural invention and its inventor. (If needed, two students/teams may be assigned the same item due to quantities)
2. Utilize the attached pre-writing guide to assist in research answering the following questions:
 - How has _____ invention made an impact on society?
 - Who, what, where, when, why and what now?
3. Pre-writing Review: After research and outline is complete, teacher should work individually or in pairs with students to review research and essay outline. Provide feedback on validity of resources and structure of outline prior to students writing essay. Use sequencing pictures and discussion questions to drive outline.
4. Peer Review: After first drafts of papers are written, provide time for peer reviews utilizing the peer review checklist. Emphasize peer reviews are a positive, helpful way writers work together to make improvements to their writing. Students should make revisions before final papers are submitted.
5. Submit final papers with a reference page and utilize rubric for grading.

Timeframes for research, writing and amount of class time could vary by class.

Evaluation

Utilize attached rubrics for research review, peer editing and final essay.



Pre-writing Research Guide

Writer's Name: _____

What is the invention?

Who is the inventor?

When was the item invented?

Where was it invented?

How does this tool improve the farming process?

Why was there a need for this tool?

Does this item still exist today? Why(or why not) has it been modified in some ways? How?

How have the other inventors' work impacted farmers or the future?

Writer's Name: _____

Paragraph Topic--use this page as a guide for outlining each paragraph.

_____ made an impact on society by _____

(invention)

Introduction

Main Idea

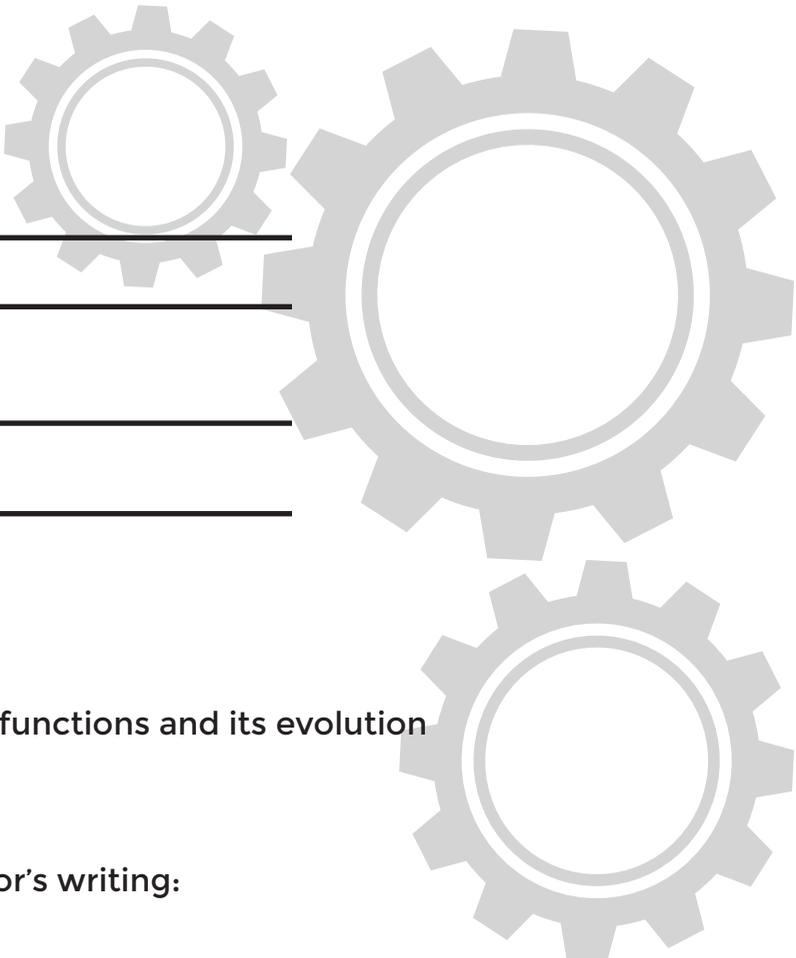
Supporting Details (3-4 per paragraph)

Supporting Details (3-4 per paragraph)

Supporting Details (3-4 per paragraph)

Conclusion

Peer Review Check list



Reviewer's Name: _____

Writer's Name: _____

What is the invention?

Who is the inventor?

Double Check Facts

Can you locate the following key ideas:

- Date Invented
- Location of Invention
- Purpose of this invention
- Short description of how the invention functions and its evolution
- Is this item still used today?

Compliments

Name three things you liked about the author's writing:

1. _____

2. _____

3. _____

Suggestions

What suggestions do you have for the author?

Consider organization, word choice, sentence length, topic and details.

Edits

Read through your peer's essay to double check for any spelling errors, spacing problems, missed punctuation or other errors. Mark any corrections directly on the essay.

Adapted from: Peer Review Strategy Guide, Read Write Think

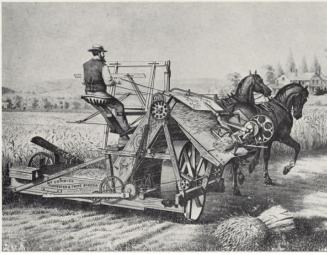
<http://www.readwritethink.org/professional-development/strategy-guides/peer-review-30145.html#related-resources>



Invention Sequencing Answer Key

Combine Harvester

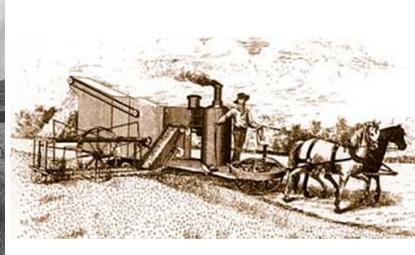
Cyrus McCormick is credited with the first patented reaper in 1834. This was the first machine to cut stalks or grasses using a reciprocating knife.



1834



1915



1887-George Stockton Berry, First self-propelled combine



Tractor-drawn combine used in the 1920s. Combines were powered by a separate gasoline engine.



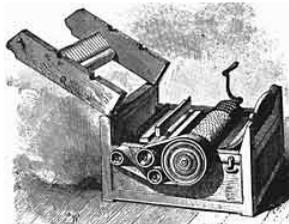
1950s first self propelled combines were invented.



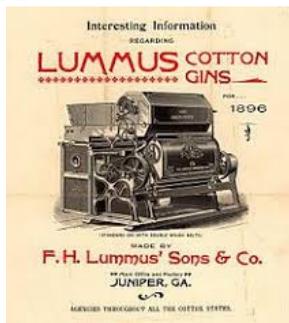
2018 Combines use computers to map fields and monitor harvest rates.

Cotton Gin

Eli Whitney invented the first machine to separate cotton fibers for use in the textile industry.



1784 First cotton gin is a hand cranked machine.



1890s mechanical cotton gins became popular



Modern Cotton Gin

Invention Sequencing Answer Key

Plow

Thomas Jefferson designed the first hand/horse drawn plow made out of wood. John Deere modified this design to use iron.



1788 Thomas Jefferson designs the first moldboard plow used to turn soil. This is made of wood.



1838 John Deere's first iron plow



1900-1920 multi-blade 'harrow'



1920s motorized plow



1950s open cab tractors with a disc plow



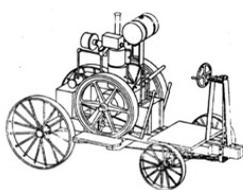
2018 Case IH's chisel plow can work up to 62 feet across at once with technology to maintain specific depths

Tractor

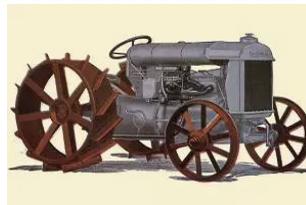
Steam powered tractors replaced horses for field work starting in the 1850s.



1850s-John Fowler invented the first self-propelled steam tractor.



1892 John Froelich invented the first gasoline powered tractor.



1907 Fordson manufactured by Henry Ford & Son. This tractor helped the people to understand how tractors could replace horses in farming.



1938 John Deere modifies the tractor to be more practical and useful to the common farmer in the post-depression era.



1938 The "comfortactor" was introduced with a built in cab.



1960s Tractors by all manufacturers increase in size, speed and power/ towing capacity.



2018 Tractors of all brands come equipped with GPS technology and a towing capacity of up to 20,000 lbs.

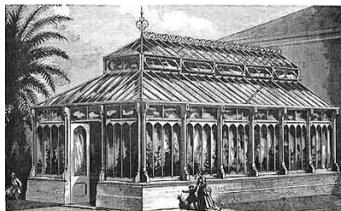
Invention Sequencing Answer Key

Greenhouse

The concept of growing plants under glass has been apart of botany since Roman Times. As scientific methods have improved, so has the concept of a greenhouse.



**Roman Times--
specularium ruins**



**French Botanist
Jules Charles designs
glasshouses for
the study of plants
around 1600**



**1787 George
Washington builds a
greenhouse at his Mt.
Vernon Estate**



**1873 King Leopold II
builds a complex of
greenhouses at his
Belgium castle.**



**1910 Flowers raised in
greenhouses were popular
for year around decorations.**



**1960s polyethylene (plastic)
became more widely used
as a greenhouse covering.**



**2000s--Acres of greenhouses
grow ornamental plants, fruits, and
vegetables worldwide. Hydroponic
or soil methods are used for
growing all year around in all
climates.**

Invention Sequencing Answer Key

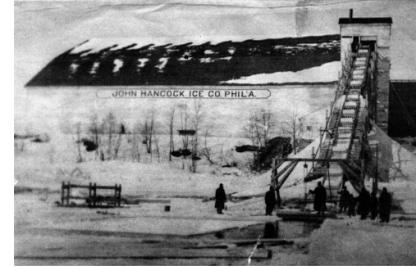
Food Preservation Food preservation first began with curing and smoking and has progressed over time, allowing us to eat safe, fresh food all year, no matter the outdoor climate.



Ancient Times-salt-curing or smoking meats was a way of preserving meat without refrigeration.



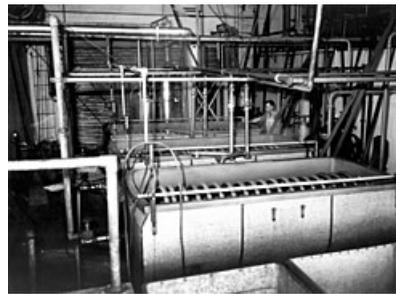
1600s Root cellars began to be used to preserve food by storing it at a cool temperature under ground.



1800s Ice was first commercially sold to keep food cold and used to transport fresh food.



1806 French chef Nicolas Appert discovered placing food in a jar, sealing with wax then boiling preserved the food.



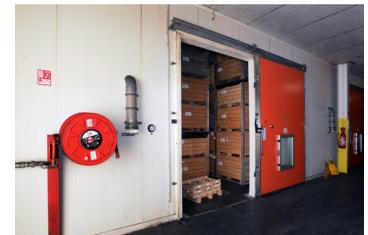
1864 Louis Pasteur discovered heating foods could kill bacteria, in a process now known as Pasteurization.



1888 The double seamed tin can began to be used in food canning.



1940 Vacuum sealing removes the oxygen from the package to prevent spoilage.



1980s More than 100 million bushels of apples could be stored in the US in controlled atmosphere storage where the oxygen level, temperature and humidity of the room could be altered to keep apples fresh.

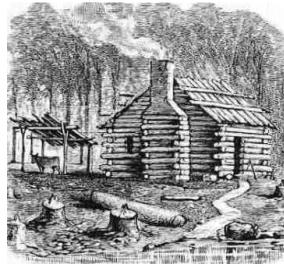
Invention Sequencing Answer Key

Logging in the U.S.

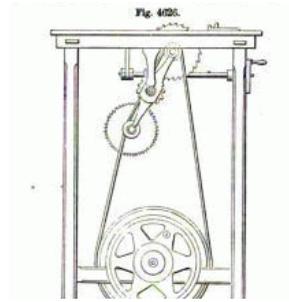
The natural resources related professions are closely tied to agriculture. The logging industry contributed to the economic success of the thirteen U.S. colonies.



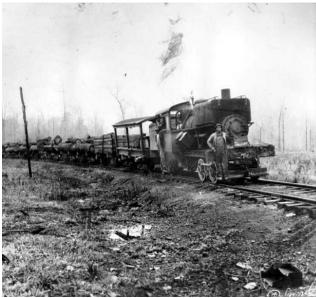
1623 The first saw mill in the U.S. opened near York, Maine.



1790 Colonial homes are being built and more than 36 million feet of pine boards were exported from New England annually.



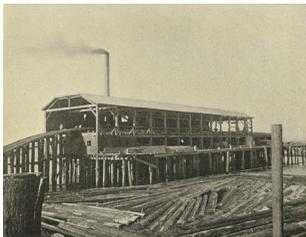
1777 The sawing machine was patented, the first type of circular saw.



1850 Trains assisted in transporting logs and lumber throughout the U.S.



1891 National Forest System was established to protect lands from over-logging.



1900 Westward expansion brings saw mills to the Pacific coast.



1920 Mechanical 'yarder' invented to move logs.



1949 John Deere introduces the MC crawler built for rough terrain.



1973 First self-propelled tree harvester was invented in Sweden.

Invention Sequencing Answer Key

Milking Machine

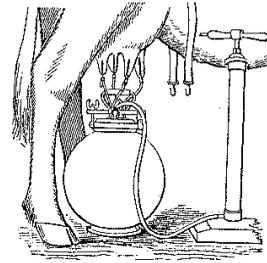
The concept of milking cows for human food purposes has been documented since ancient times. The mechanical innovations in this process have drastically improved in the last century.



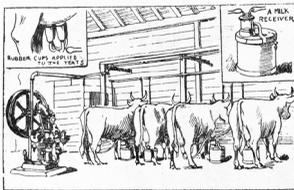
3100 BC carvings of milking cows appeared in ancient Egyptian civilizations.



Milking by hand continued



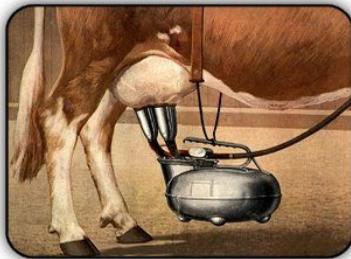
1851 the first vacuum milking machine was patented.



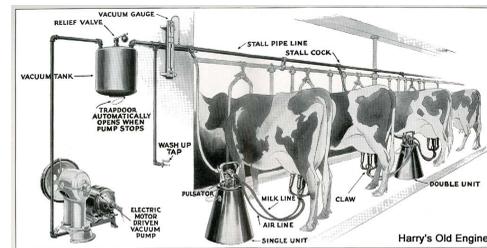
1892 The Thistle Milker was the first pulsating vacuum milker to hang from the cow's udder



1898 A foot pedal system is used to milk two cows at the same time.



1922 Surge Milker decreased the distance from the udder to the container, reducing the risk of contamination.



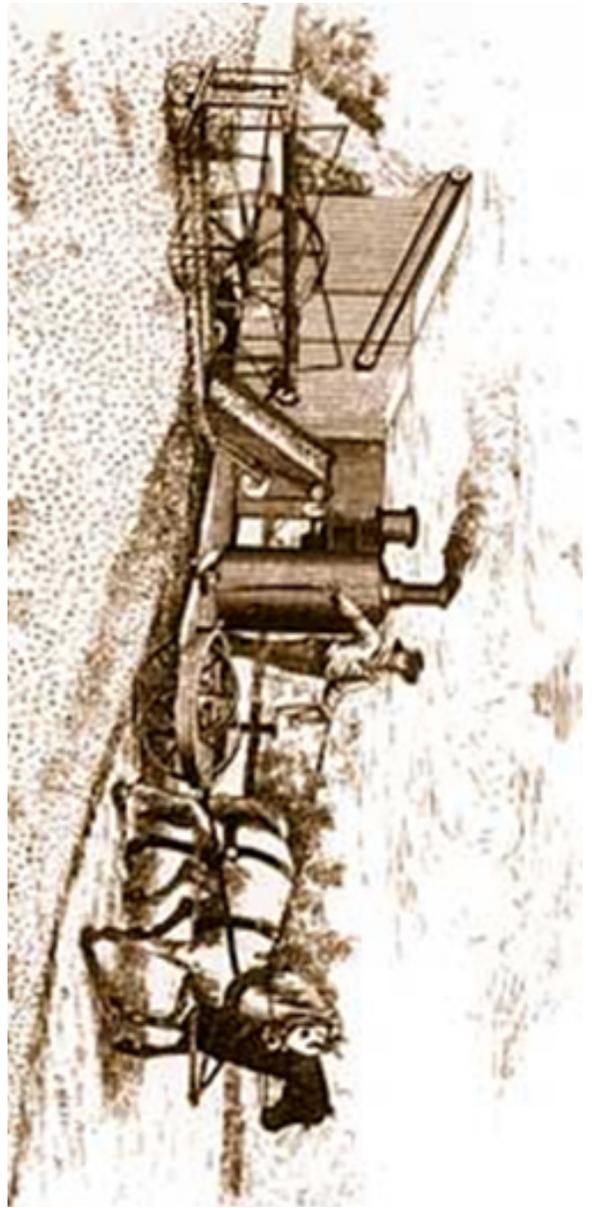
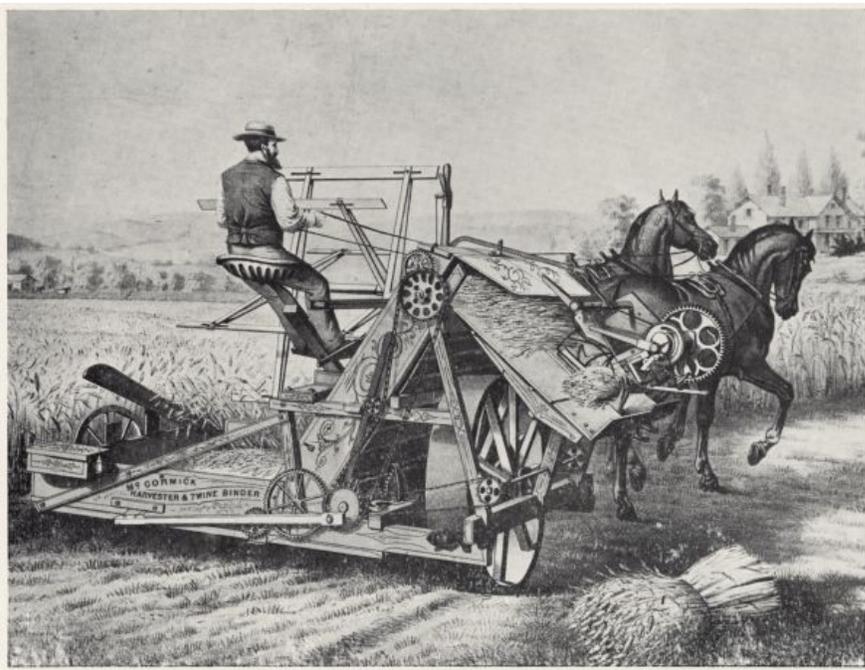
1920-30s Dairy barns modify using a pipeline system for transporting milk from cows to larger tanks.



1952 The first Herringbone parlor is used. This helped farmers move a row of cows in together for milking in one clean space.



1992 Lely introduces the first robotic milking machine where a cow enters of their own choosing to be milked.

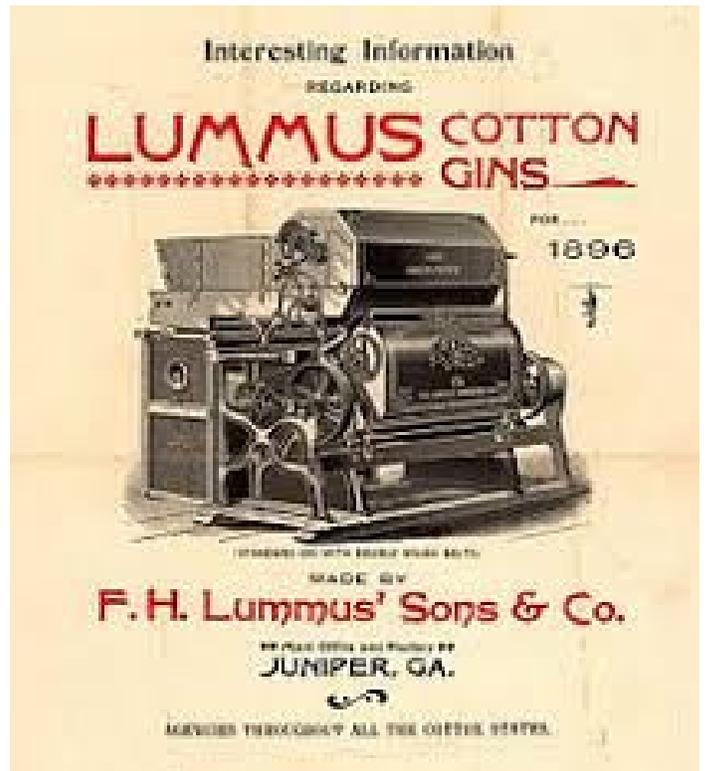
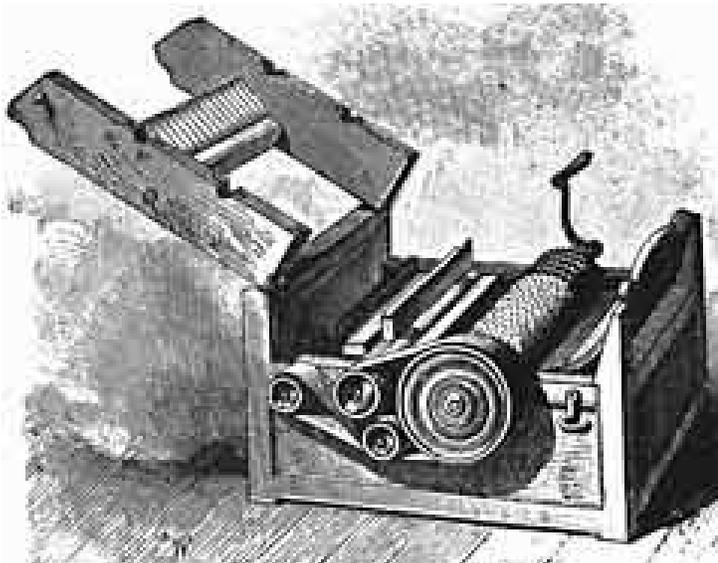


COMBINED WHEAT HARVESTER

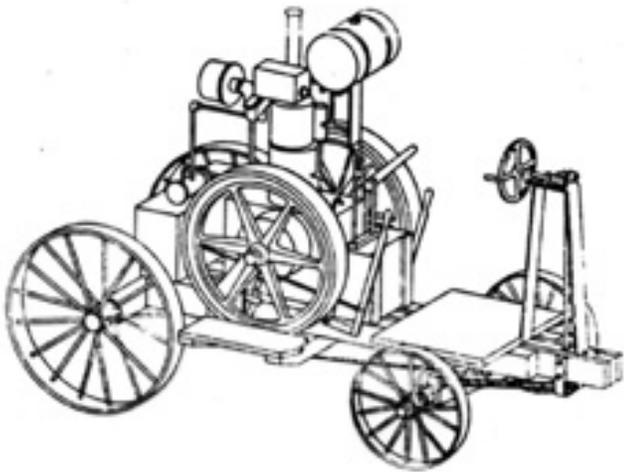


SIDE VIEW OF A COMBINED HARVESTER AND THRESHER, CAPACITY 125 ACRES PER DAY





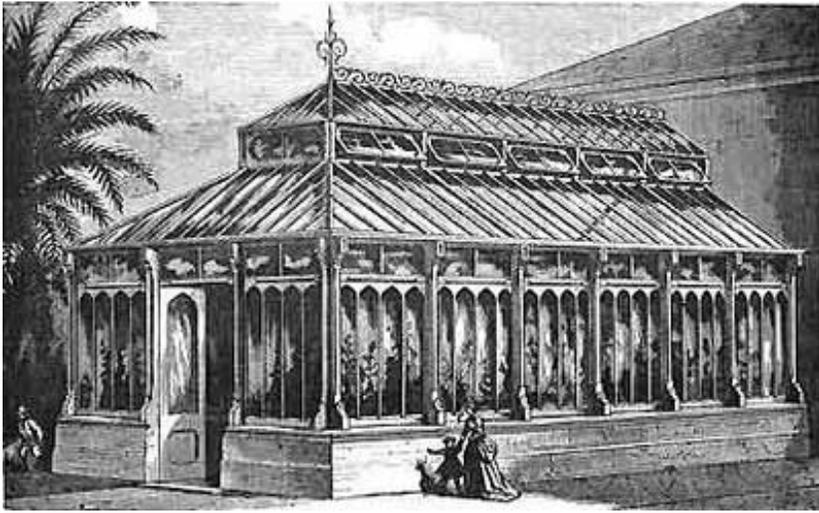




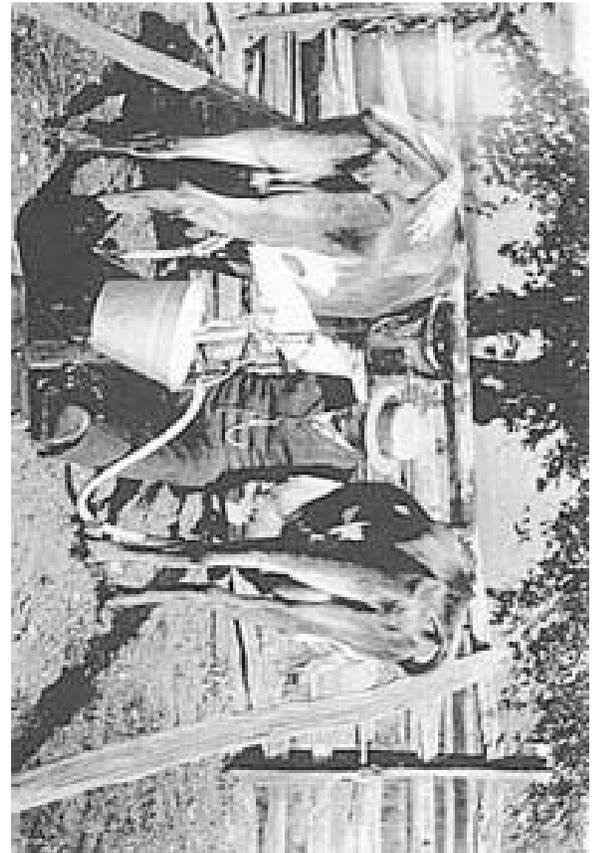
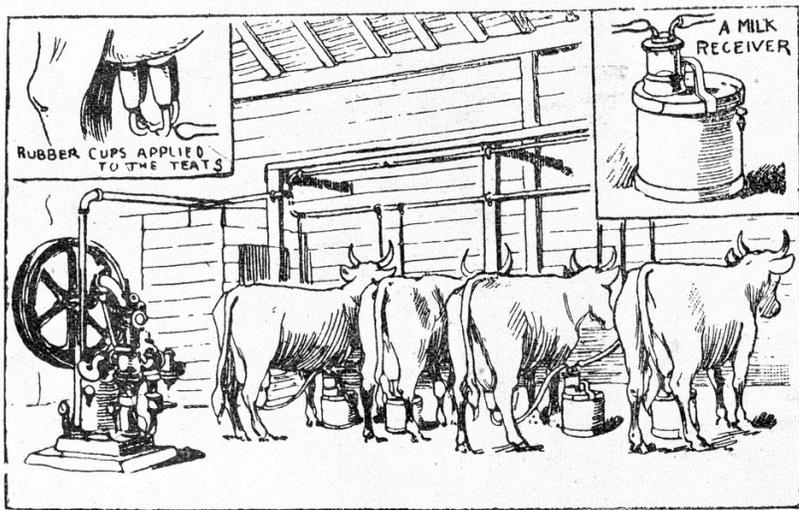
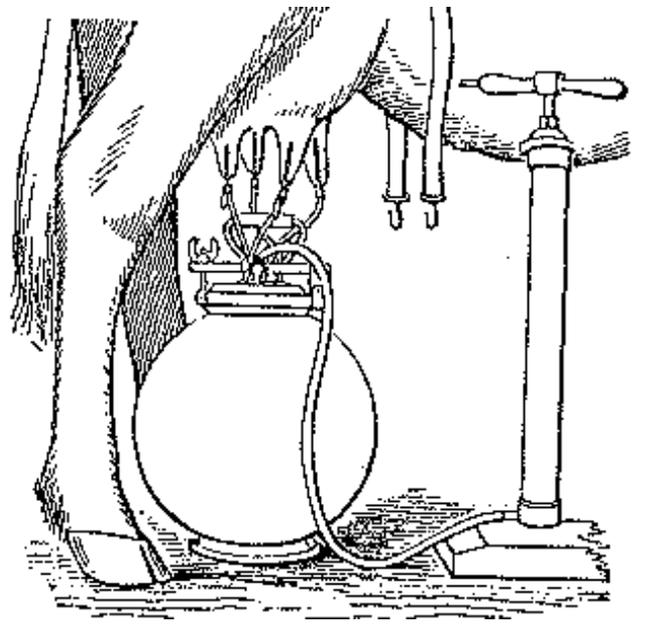


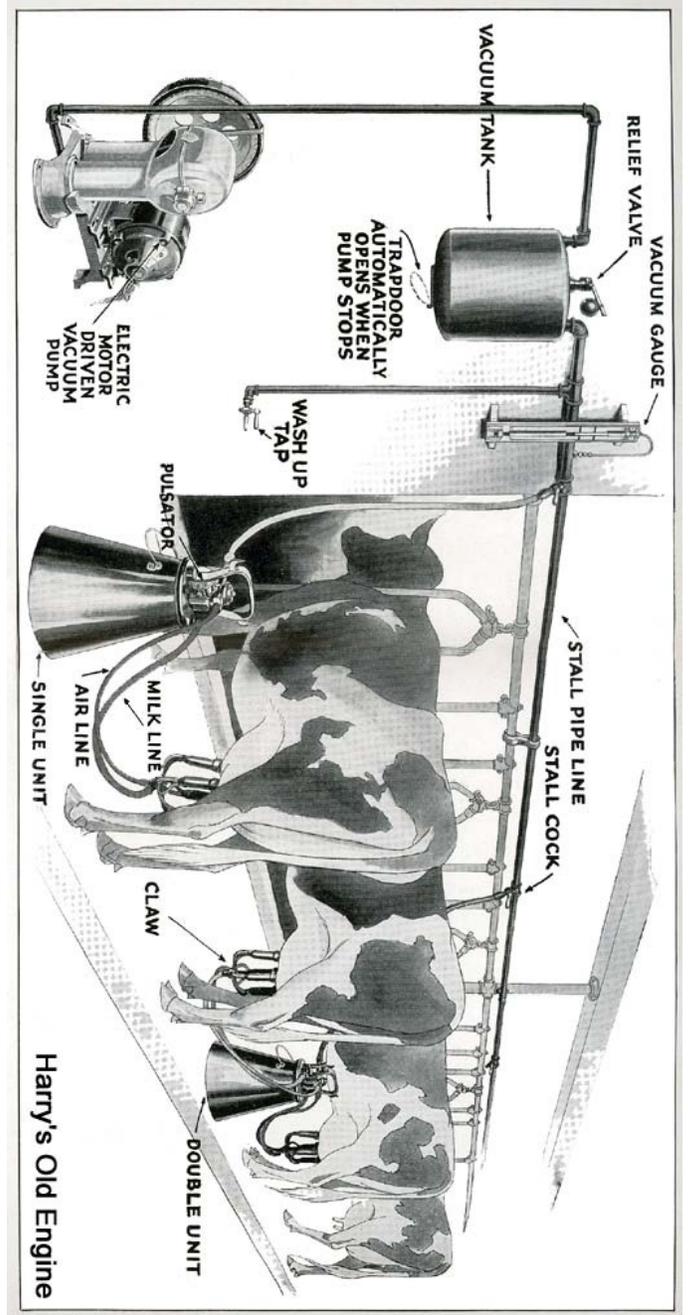
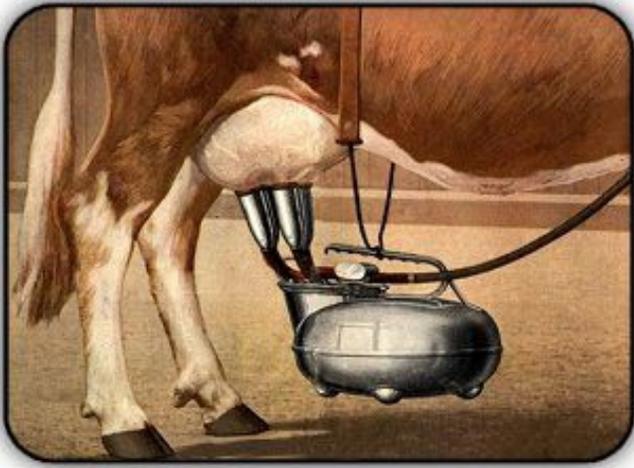
TractorData.com

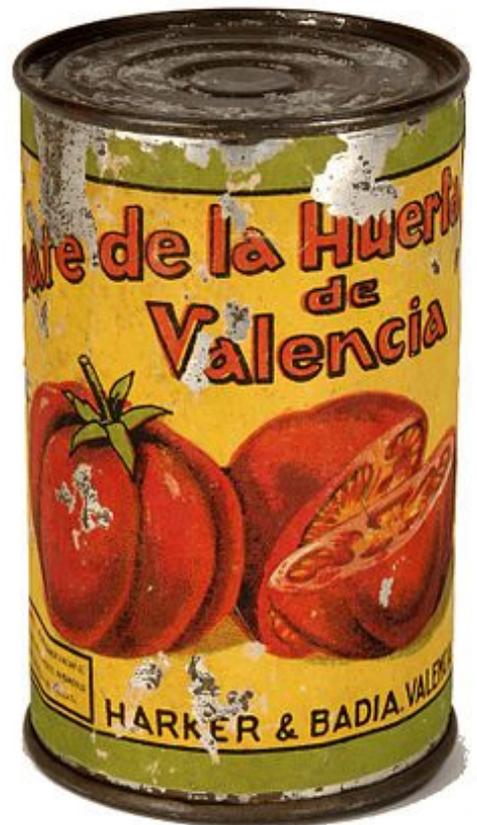
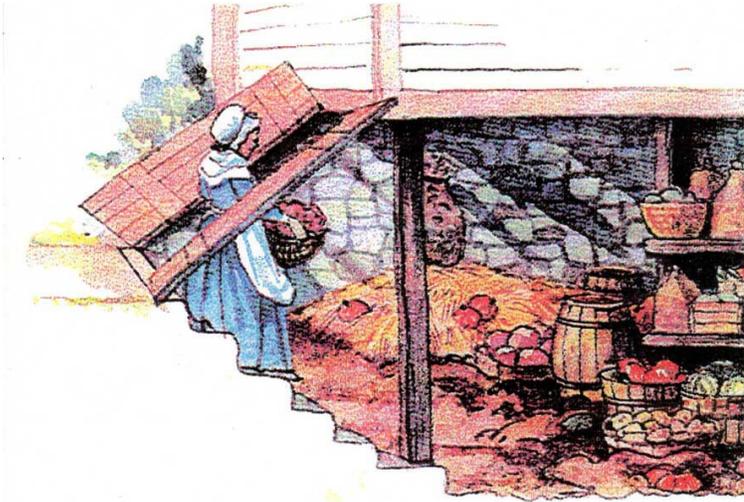


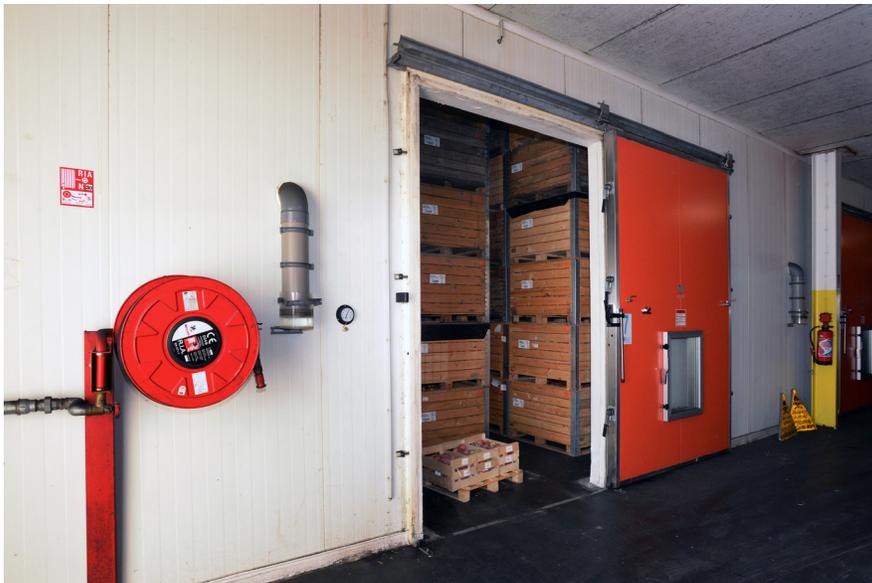
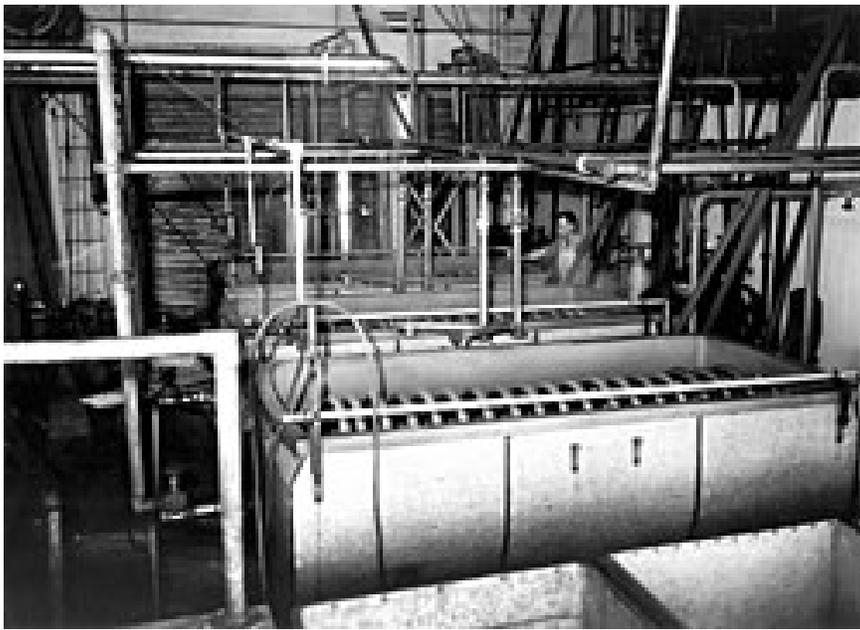


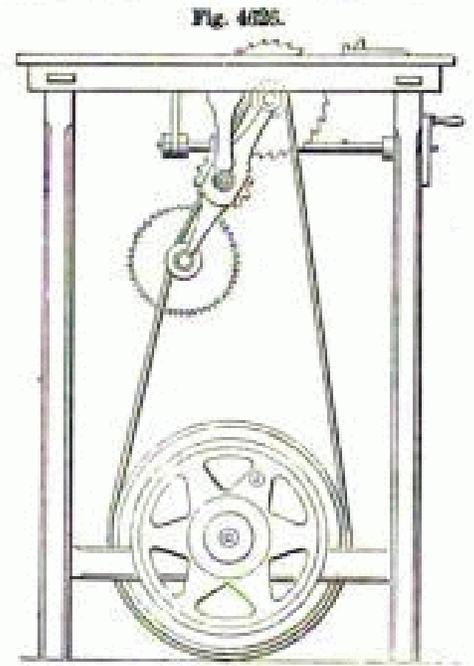












Sawing-Table.



