

# Machine Compactor for Proctor Density and Pneumatic Specimen Remover

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● PRESENTED are apparatus for use in producing uniform compaction effort in

rammer with 18 in. of free fall and compaction effort for Bruce Marshall Stability Machine and for removing sample specimen from molds in Proctor density tests.

The machine compactor makes use of main groups of mechanics to transfer energy into the desired work. While carrying nothing

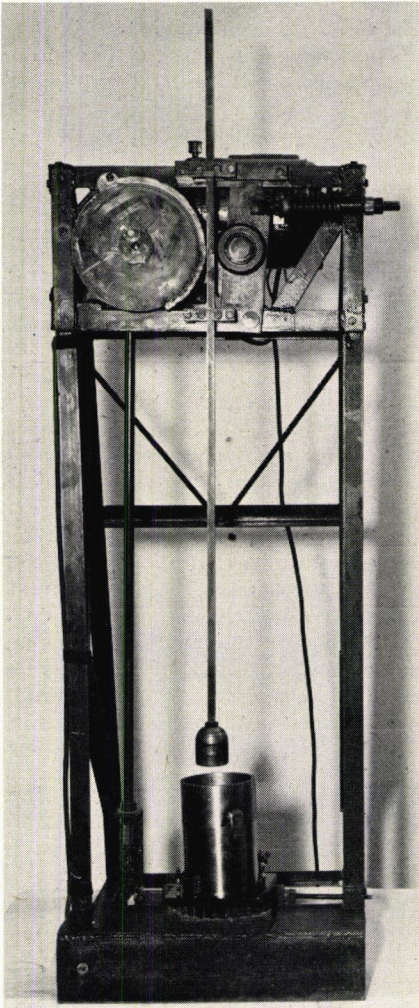


Figure 1. Front view of complete machine.

performance of both the Standard Proctor Density, AASHTO Method T-99-49, Modified Proctor Density Test, supplying a 10-lb.

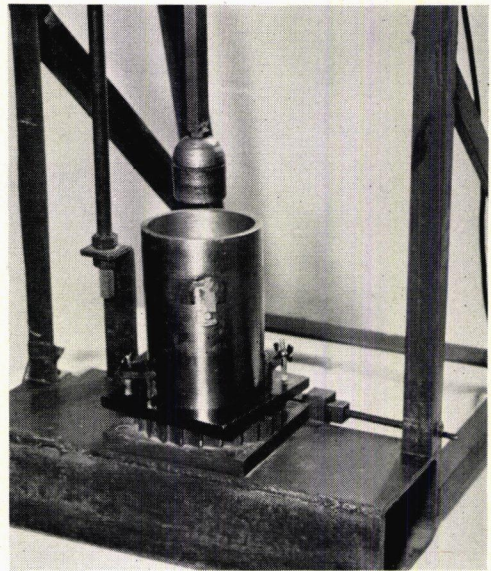


Figure 2. Specimen rotator.

basically new, this does transfer known mechanics into a new field of operation.

The main group of mechanics involved are (1) power, (2) machinery for transferring power into work, (3) specimen rotator, and (4) timer and switch.

Results are obtained (Fig. 7) by attaching a circular steel disc of proper size to the shaft of the gear reduction unit. The face of this disc can be either plane, concave or angular, with a raised or extended arc of 12 or 18 in. to give either a 12- or 18-in. drop of the rammer. A rammer of such length and surface with proper compaction head to give correct weight



Figure 3. Motor and gear reduction unit.

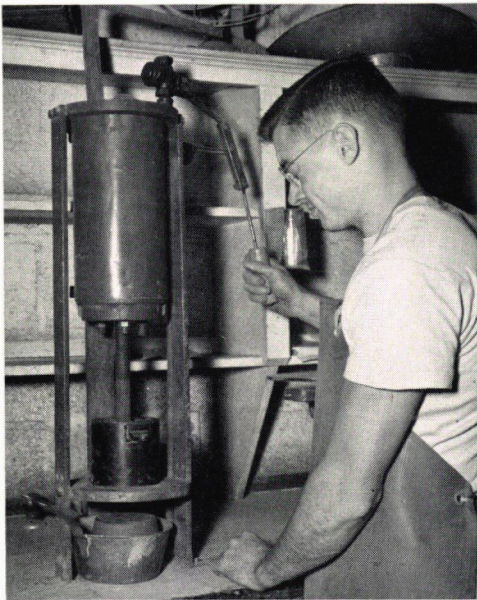


Figure 4. Pneumatic specimen remover.

is fitted vertically between the disc and an opposed friction roller bearing. This stem is raised by friction when in contact with the extended arc of the disc and dropped the desired height when released by same. The height of the drop being controlled by the length of the extended arc. A suitable frame (Fig. 8) to accommodate the entire mechanism may be made of solid bars, angle iron or steel pipe as desired.

A heavy steel base is provided for the mold seat to take the impact from the rammer. The mold is seated on a revolving stand geared to rotate in increments of 25 units so that the rammer will cover the entire surface of the specimen in a complete cycle of 25 blows. The rotation of the mold is accomplished by an eccentric working off the main shaft of the gear reduction unit and its action is transferred to the specimen rotator thru a vertical rod and wedge assembly.

A coordinated timing device is provided by means of a small gear actuated by a short shaft working off the main eccentric, which in turn operates a small cam that operates a magnetic electric switch.

In this machine the cycle is one complete revolution of the mold during which the specimen receives 25 blows from the rammer by gravity as in the hand method. The entire cycle is automatic after the specimen is placed in the mold, and the manual switch is thrown. The cycle can be stopped at any point desired by use of the manual switch or allowed to continue to completion where the automatic switch will stop the cycle.

The pneumatic specimen remover (Fig. 9) is an air-operated piston set in a steel frame oriented in such a manner as to push the compacted specimen from the mold.

Details of the equipment and operation are shown in the figures.



Figure 5. Machine in operation.

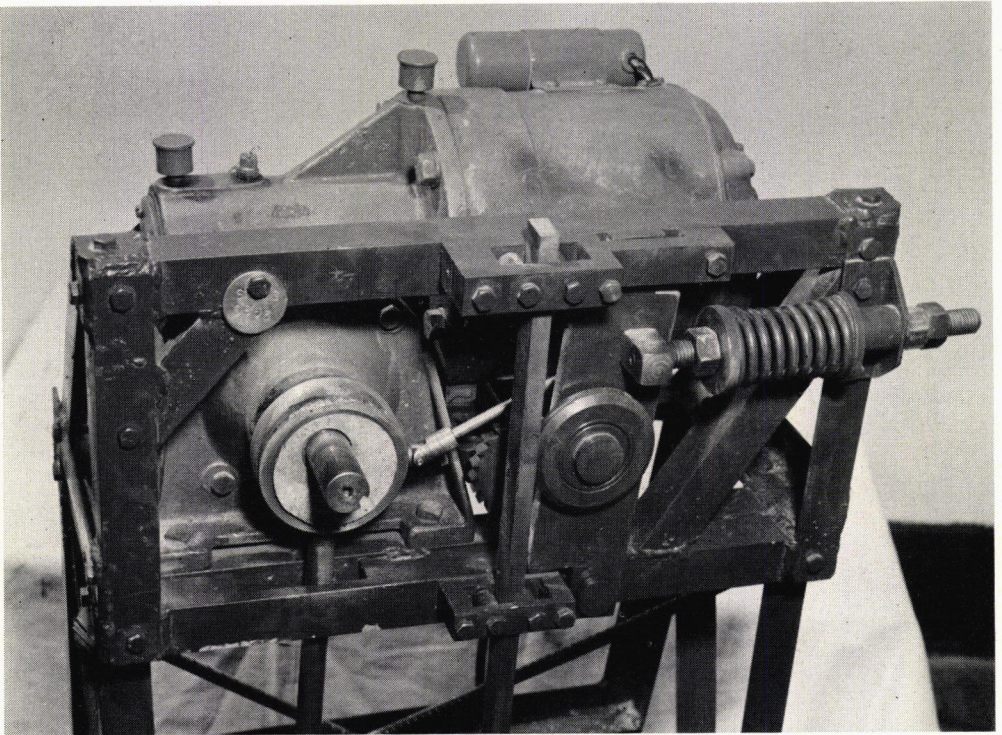
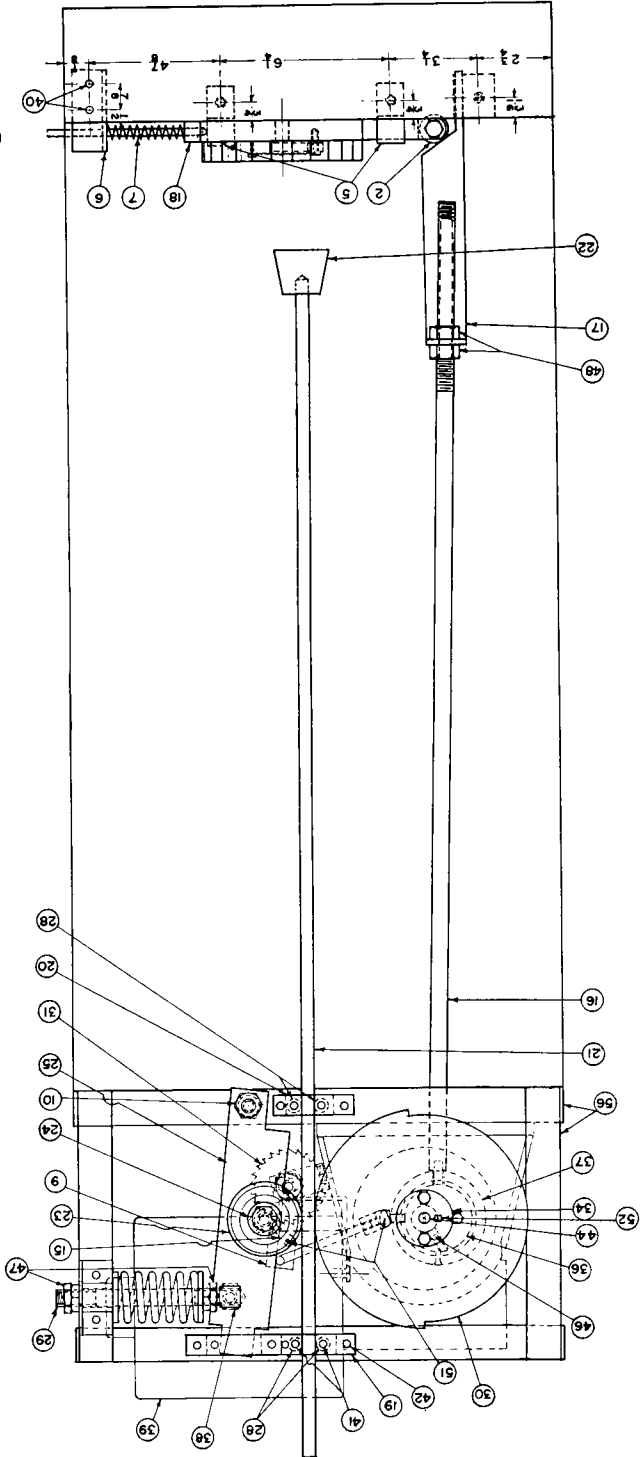


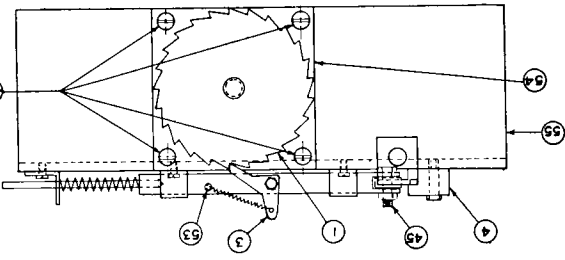
Figure 6. Power assembly.

Figure 7.

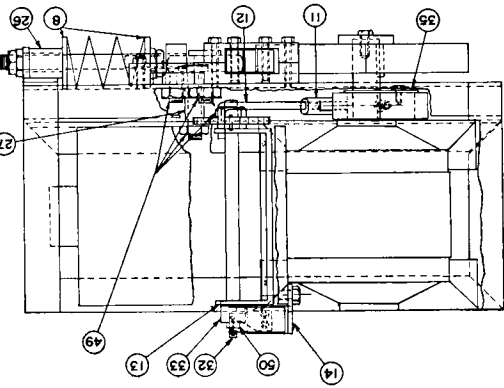
FRONT VIEW



TOP VIEW OF LOWER MECHANISM

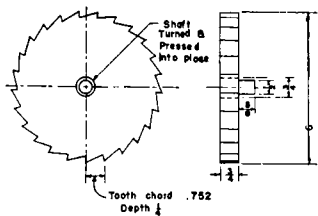


TOP VIEW OF UPPER MECHANISM

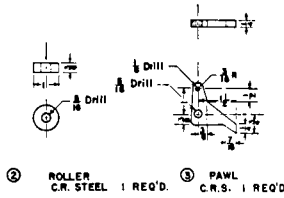




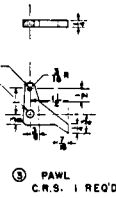




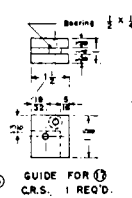
① RACHET GEAR  
C.R. STEEL 1 REQ'D.



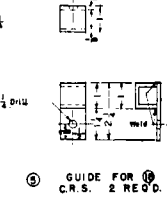
② ROLLER  
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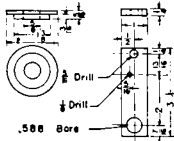
③ PAWL  
C.R.S. 1 REQ'D.



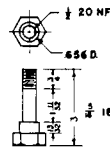
④ GUIDE FOR ②  
C.R.S. 1 REQ'D.



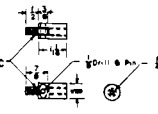
⑤ GUIDE FOR ③  
C.R.S. 2 REQ'D.



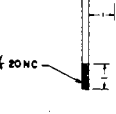
⑥ WASHER  
C.R.S. 2 REQ'D.



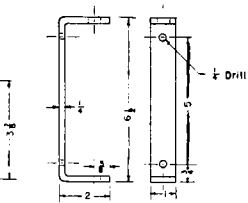
⑦ ARM  
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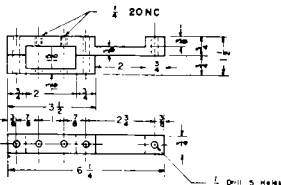
⑧ BOLT  
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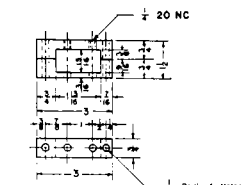
⑨ HINGE FOR ②  
C.R.S. 1 REQ'D.



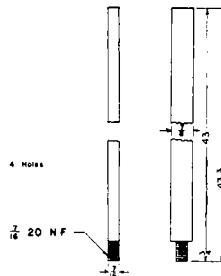
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1 REQ'D.



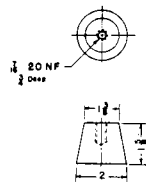
⑪ BRACKET  
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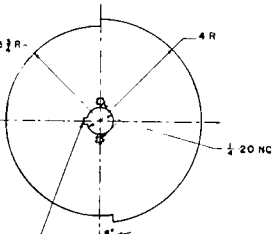
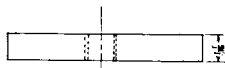
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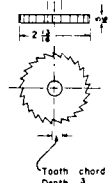
⑬ BAR  
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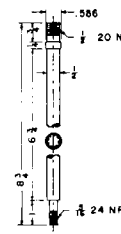
⑭ HAMMER  
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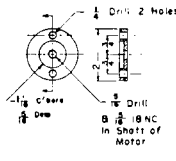
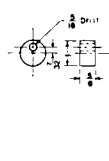
⑮ RACHET GEAR  
C.R.S. 1 REQ'D.



⑯ SHAFT  
C.R.S. 1 REQ'D.



⑰ CAM  
C.R.S. 1 REQ'D.



⑱ LOCK FOR ⑰  
C.R.S. 1 REQ'D.

Figure 10(a).



