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SUCTION ATTACHMENT FOR REMOVING DUST FROM HOPPER OF  
WHEELBARROW POWER DUSTER

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In order to facilitate the frequent changes of insecticidal dusts used in small experimental field plots, parts of an old vacuum cleaner were assembled into a unit and attached to the hopper of a four-row wheelbarrow duster in such a way that it could be powered from the duster motor to remove the dust remaining in the machine after each application.

Since this unit was to be used on a hand-propelled duster, the weight was kept to a minimum by using only the essential parts of a vacuum cleaner of a type that could be readily adapted to the desired changes with the limited shop facilities at hand. In addition to the extra weight of the motor and housing and nozzle of the original vacuum cleaner and the difficulty of attaching it to the duster, these extra parts consisted essentially of critical war materials and were not used.

A 6-inch section of 4 x 5 x 2 inch channel iron and a circular metal plate, in the center of which the inner (right-hand) fan-shaft bronze bearing was soldered, were used to replace the vacuum cleaner motor housing, as shown in figure 1. The fan housing was bolted to the plate and the upper end of the 2-inch side of the channel iron, using the threaded holes already provided for the attachment of the motor housing.

In order to facilitate alinement of the outer bearing and to permit removal of the drive belt, an oblong opening was made near the upper end of the 4-inch face of the channel iron opposite the inner fan-shaft bearing mentioned above. The bushing for the outer bearing was soldered to a metal plate which was bolted over the opening in the iron to aline with the inner bearing as shown in figure 2, with another plate over the opening on the outside to protect the bearing and end of the shaft from dust.

Before installing the bearings, the oil reservoir in each was wrapped with felt to serve as wicking and covered with a sleeve with an oil tube attached as shown in figure 1. This figure also shows the spacing washers at the inner bearing used to take up end play in the shaft and to adjust for clearance of the fan in the housing.

The armature of the vacuum cleaner was left attached to the shaft and modified to serve as a pulley by grooving it to take a half-inch V-belt at such depth that it would be equivalent to a 1 1/4 inch pulley. The fan then turned at approximately 11,200 r. p. m. when belted to a 5-inch pulley on the duster motor shaft turning at about 2,800 r. p. m.

The intake spout was attached to the fan housing, as shown in figure 2, by means of a wood spacer ring to take the place of the original nozzle housing.

The cleaner unit was mounted on an angle-iron support attached to the duster frame and to the hopper, as shown in figures 1 and 2, with the mounting bolts serving as pivots upon which the unit can be raised to tighten the belt for operation. A wooden arm pivoted to the upper end of the cleaner was arranged to engage with a bracket on the duster hopper to maintain tension on the belt when the unit is raised for operation as shown in figure 2. It can be easily disengaged to loosen the belt when the cleaning operation is over. The duster agitator idling pulley bracket seen at the lower left in figure 2 was also somewhat modified by inserting a stop block of proper length in the adjusting slot outside the supporting bolt. A lock nut was then put on the bolt and its tension so adjusted that the bracket can be readily pivoted by hand to change the tension on the belt, while the stop prevents it from sliding inward to loosen the belt when the pulley is raised.

One end of the vacuum cleaner flexible tubing is attached to the intake spout, and the free portion of the tubing is hung over the duster frame when not in use. A muslin bag with drawstring is used for each insecticide taken from the hopper.

When it is desired to clean the hopper, a cloth bag is tied to the cleaner outlet and the assembly raised, as shown in figure 2, to start the fan. The duster idling pulley is lowered to loosen the belt and stop the motion of the feed screw and agitators in the hopper, and the free end of the flexible tubing is then used to draw the bulk of the dust from the hopper into the cloth bag. The flattened spade, or upholstery cleaning tip, is then inserted into the end of the tubing and used to draw the dust from about the feed screw and other rather inaccessible places, as shown in figure 3.

For further cleaning, if necessary, after the bag of collected dust has been removed the end of the flexible tube may be slipped from the intake spout and held in the stream of air from the cleaner outlet, thus forcing enough air through the tubing and tip to blow any remaining dust from the hopper.

The cleaner assembly is practical under field conditions, and the unused dust remaining from an application may be removed to the collecting bag in approximately 2 minutes.



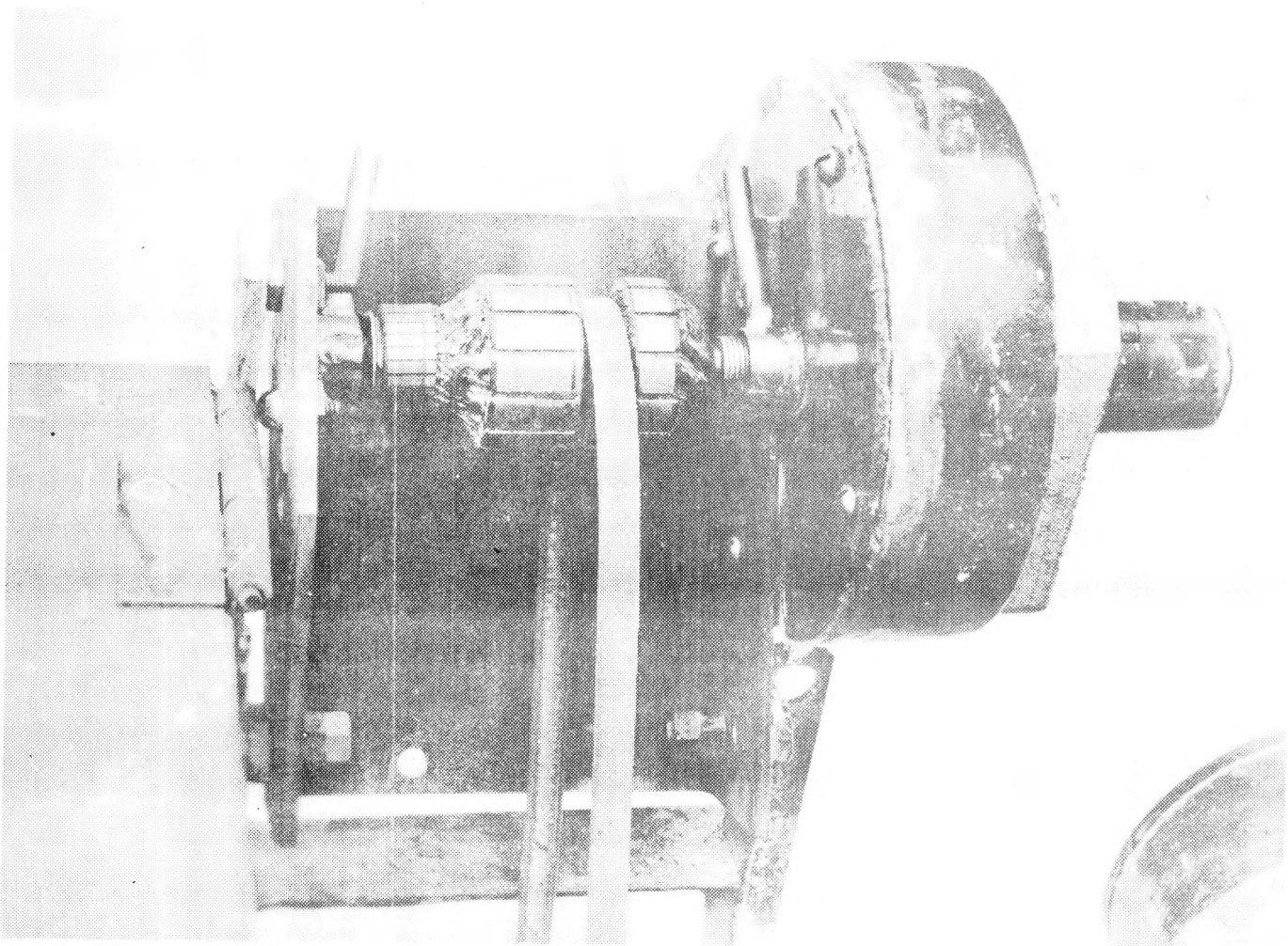
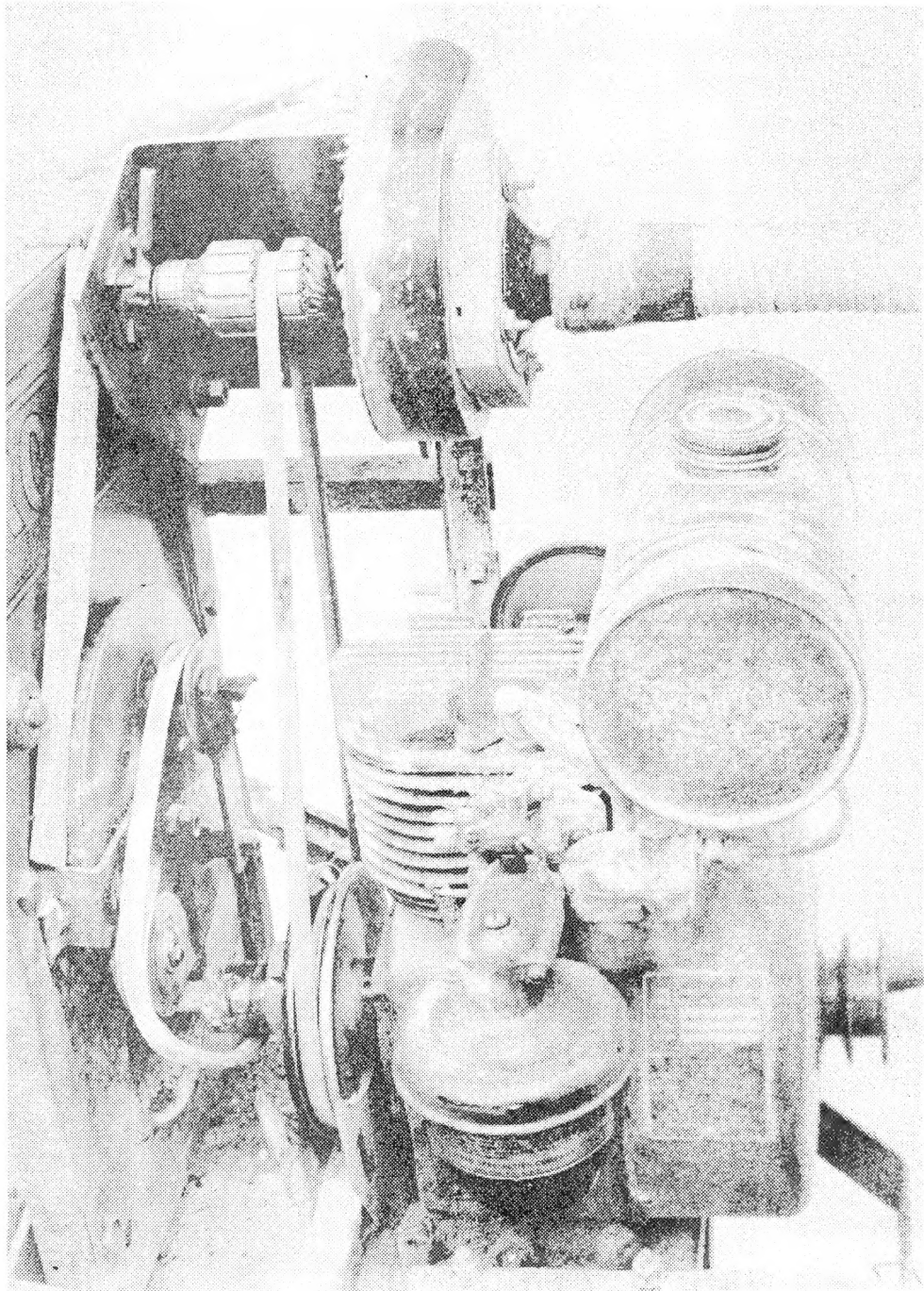


Figure 1.—Details of construction of the cleaner attachment.







**Figure 2.—Method of attachment and operating position of cleaner attachment.**



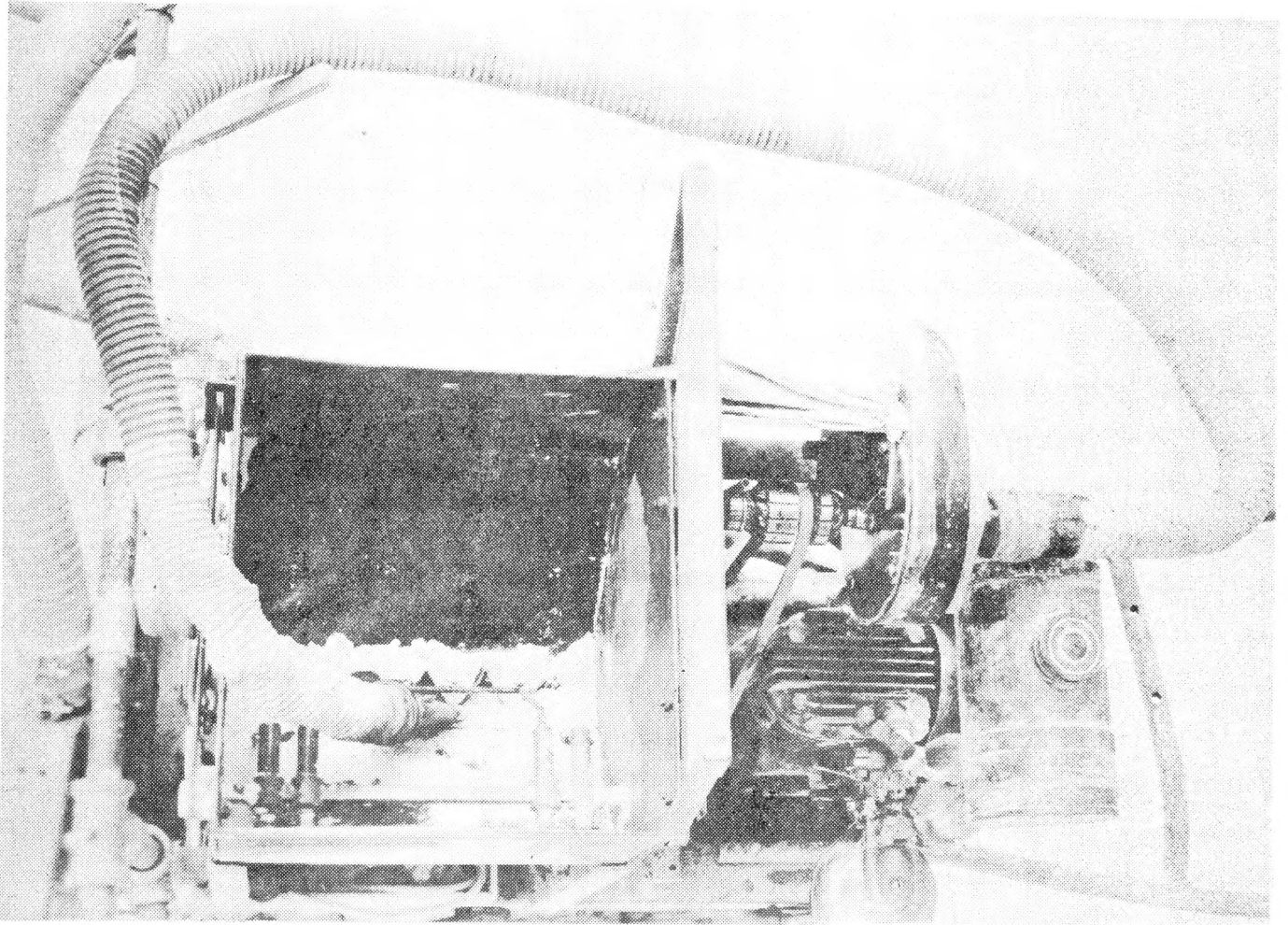


Figure 3.—Top view of cleaner unit and flexible tubing in operating position for removing dust from about the feed screw and agitators in the duster hopper.

